Poster Session 2, Monday 27 September

Ageing and dementia 2

P2001

First genetically proven case of Gerstmann-Straussler-Scheinker disease in the Czech Republic: a case report of an atypical clinical course

J. Fiala[1], R. Rusina[1], M. Matejickova[2,3], J. Novakova[2,3], R. Matej[2,3]
[1]Department of Neurology, [2]Department of Pathology and Molecular Medicine, [3]National Reference Laboratory for Diagnostics of Human Prion Diseases, Thomayer Teaching Hospital, Prague, Czech Republic

Introduction: Gerstmann-Straussler-Scheinker disease (GSS) is a very rare inherited autosomal dominant prion disease caused by a pathogenic mutation in the prion protein gene (PRNP). Clinical manifestations typically include progressive ataxia with subsequent development of dementia and myoclonus. We report a case of GSS with a presentation suggestive of the genetic form of Creutzfeldt-Jakob disease (fCJD).

Case presentation: A 44-year-old woman with a history of dementia and prominent ataxia in her mother (autopsy was not performed) developed dementia with mainly dysexecutive features, anosognosia and spastic right-sided hemiparesis. Three months later, left-prevalent ataxia in all extremities and progressive spasticity developed. One month prior to her death, 5 months after disease onset, startling myoclonus appeared. MRI showed hyperintense signal in FLAIR and DWI images located in caudatum and mesio-frontal and insular cortex bilaterally, protein 14-3-3 in CSF was negative but EEG revealed generalized triphasic periodic complexes. Our clinical diagnosis was probable fCJD. In the autopsy neuropathological hallmarks of GSS were found and a pathogenic P102L mutation in the PRNP gene was detected. The case was closed as definite GSS.

Conclusion: The presented case of GSS differed from the original description and classical presentation of the syndrome in terms of relatively rapid disease course, early cognitive impairment and later onset of ataxia. Moreover, the clinical picture together with abnormal EEG and MRI was highly suggestive of fCJD. In addition, this case is the first genetically proven GSS in the Czech Republic.

Acknowledgement: This study was supported by grant IGA NS 10335-3/2009

P2002

Cerebrospinal tau, phospho-tau, and beta-amyloid and neuropsychological functions in Alzheimer's and Parkinson's disease

E. Stefanova[1], I. Markovic[2], G. Mandic-Stojmenovic[1], T. Stojkovic[1], M. Jecmenica Lukic[1], V. Kostic[1]
[1]Institute of Neurology, [2]Institute of Biochemistry, Belgrade, Serbia

Objective: The aim of this study was to assess cerebrospinal fluid (CSF) levels of total tau, phospho-tau, and beta-amyloid, proposed as biomarkers for Alzheimer's disease (AD), and their relationship with cognitive function in Parkinson's disease (PD).

Methods: 78 patients with AD and 40 PD patients (20 non-demented (PDND); 20 demented (PDD] and 50 controls underwent CSF tau, phospho-tau, and beta-amyloid analysis using specific ELISA techniques. All AD and PD patients and controls underwent neuropsychological testing of fronto-subcortical (attention, fluency) and neocortical (memory, naming, visuoperceptive) functions. CSF marker levels were compared between groups, and compared and correlated with neuropsychological measures in PDND and PDD separately and as a continuum (PD) with AD and controls.

Results: CSF tau and phospho-tau were higher in AD and PDD than in PDND and controls ($p<0.05$). CSF beta-amyloid ranged from high (controls) to intermediate (PDND), and low (PDD) levels ($p<0.001$), with the lowest values in AD subjects. In all PD and PDD patients, high CSF tau and phospho-tau were associated with impaired memory and naming. In PDND, CSF beta-amyloid was related with phonemic fluency.

Conclusions: These findings suggest that dementia in PD and lower cognitive functioning is associated with higher CSF tau and phospho tau levels. The lower CSF beta-amyloid in PDND patients with impaired phonemic fluency could constitute an early marker of cognitive dysfunction.

P2003

Influence of physical activity on the cognitive performance of patients with aMCI using the Cambridge Neuropsychological Test Automated Battery (CANTAB)

F. Brunner[1], K.K. Alichniewicz[1], H.H. Klünemann[2], M.W. Greenlee[1]
[1]Institute of Psychology, [2]Department of Psychiatry, Psychosomatics and Psychotherapy, University of Regensburg, Regensburg, Germany

Objectives: Different studies showed a positive effect of physical activity on the cognitive performance of healthy old adults. The aim of the present study was to examine the effects of physical activity on the cognitive performance of patients with amnestic mild cognitive impairment (aMCI).
Methods: Sedentary aMCI patients were either assigned to a three-month walking program (n=18) or a control group (n=18) without treatment. Patients in the walking program (WP) received a one-hour training session three times a week. Both groups were examined at two time-points using the following subtests of the CANTAB: Delayed Matching to Sample, Spatial Recognition Memory, Spatial Working Memory, Rapid Visual Processing, and Stockings of Cambridge. Additionally, we used Corsi Block Tapping from the Wechsler Memory Scale Revised to examine spatial working memory and spatial attention. To examine the physiological influence of the walking program, we used maximal oxygen consumption (VO2max).
Results: The WP had no significant influence on VO2max and on most of the neuropsychological tests. In the Spatial Working Memory: strategy occurred a significant group-time interaction in favour of the WP group. In the Corsi Block Tapping forward occurred a significant group-time interaction in favour of the control group.
Conclusion: Overall the WP did not lead to improvement in the cognitive performance of aMCI patients except for one measure of frontal lobe function. Supposable a WP with a higher intensity or over a longer time period would cause improvement in more cognitive functions.

P2004

Outcomes of COGNOS study. Care for people with cognitive dysfunction. A national observational study in Belgium

T. Mets[1], A. Albert[2], P.-P. De Deyn[3], J. De Lepeleire[4], A. Ivanoiu[5], P. Pals[6], M. Vandewoude[7], M. Ventura[8], A.-K. Seghers[9]
[1]VUB, Brussels, [2]UCL, Liège, [3]UZA Middelheim, Antwerp, [4]KUL, Leuven, [5]UCL, Brussels, [6]AZ St Maarten, Duffel, [7]ACZ, Antwerp, [8]GHDC, Charleroi, [9]Pfizer, Brussels, Belgium

Objective: The COGNOS study aims at documenting the diagnostic, therapeutic and care management of patients diagnosed with Alzheimer's disease (AD) in a specialized care setting. It focuses on the content and implementation of 'the care plan', which is requested for the reimbursement procedure for cholinesterase inhibitors (CI) in Belgium.
Method: COGNOS is a study in community dwelling patients newly diagnosed with AD. Data collection for physicians consisted of the completion of a CRF at baseline and one at follow-up visit. For patients, it consisted of the completion of a questionnaire at baseline and follow-up.
Results: A total of 85 investigators enrolled 720 patients of whom 439 completed the questionnaire. Of 452 Patients at the follow-up visit, 243 completed the second questionnaire. Age in geriatric care was higher than in neurological care. At follow-up, 13.7% of initially enrolled patients were institutionalized. The main reason for first consultation was cognitive problems in geriatric care (81.6%) as well as in neurological care (88.8%). However in geriatric care, functional (30.9%) and behavioural (31.6%) problems were twice as common as in neurological care. 11% of patients presented with an MMSE score <14, 33.3% in the range of 15-20, 50.9% in 21-26 and 4.8% >26. 70% of patients received CI after AD diagnosis. Perception of life and professional help were judged significantly better at follow-up.
Conclusion: The COGNOS study demonstrates that measures taken by governmental institutions to provide reimbursement for medication (for example "a care plan") can lead to a better care of patients.

P2005

Nicastrin (NCT) upregulation by neuroprotective concentration of anandamide (AEA) modulates notch pathway in primary neuronal cultures: implications in neurodegenerative disorders

R. Tanveer, V.A. Campbell
Department of Physiology, University of Dublin/ Trinity College Institute of Neuroscience, Dublin, Ireland

γ-secretase is involved in processing numerous type-1 membrane associated proteins, including amyloid precursor protein (APP) and notch. Nct acts as a receptor site for substrate recognition, maturation and stabilization of the γ-secretase complex. Whilst over-expression of Nct is not associated with excess processing of neuronal APP, it has been proposed to be anti-apoptotic and neuroprotective promoting different pro-survival pathways. We previously demonstrated different neuroprotective effects of the endocannabinoids, AEA and 2-arachidonoyl glycerol (2-AG) against β-amyloid-induced neurodegeneration. In the current study we examined the influence of the cannabinoid system on Nct expression and notch pathway in cultured cortical neurones since this may represent a novel neuroprotective target. Primary neuronal cultures prepared from neonatal rat cerebral cortices were treated with AEA (10nM) or 2-AG (10nM) for 1, 6, 24 or 48 hours. AEA significantly induced Nct protein expression at 6 hours and it was persistent 24 and 48 hours later as measured by western immunoblot and fluorescent immunostaining. This induction paralleled with increased nucleolar translocation of notch intracellular domain (NICD). In contrast, 2-AG treatment was not associated with any change in Nct expression or nucleolar NICD translocation at any of the time points examined. These data demonstrate that neuroprotective concentration of AEA positively regulates the notch pathway, which is altered in different neurodegenerative disorders. Our current work investigates the impact of induction of notch pathway on different pro-survival pathways and whether pharmacological enhancement of endogenous AEA tone using inhibitors of fatty acid amide hydrolase can produce similar results in-vitro and in-vivo.

P2006

Mortality in mild cognitive impairment: results from the Korean longitudinal study on health and aging (KLOSHA)

J.J. Lee[1], H.G. Jeong[2], J.W. Han[2], S.B. Lee[3], T.H. Kim[2], J.H. Park[4], Y.S. Huh[2], E.A. Choi[5], J.Y. Choe[2], Y.J. Do[2], K.W. Kim[2]
[1]Psychiatry, Kyungpook National University Hospital, Daegu, [2]Neuropsychiatry, Seoul National University Bundang Hospital, Seongnam, [3]Psychiatry, Dankook University Hospital, Chungcheongnamdo, [4]Psychiatry, Jeju National University Hospital, Jejudo, [5]Psychiatry, Yesarang Hospital, Chungcheongbukdo, Republic of Korea

Objective: To assess mortality associated with mild cognitive impairment (MCI) overall and by its subtypes among elderly Koreans.
Methods: 811 community dwelling Korean elders aged 65 years or older who participated in the KLOSHA have been followed 45 months. At baseline, 307 subjects were diagnosed with MCI (68 amnestic MCI single domain type, 103 nonamnestic MCI single domain type, 136 MCI multiple domain type) according to the revised diagnostic criteria proposed by the International Working Group on MCI. Data were analyzed with the Cox proportional hazards model having adjusted for age, gender and medical comorbidities.
Results: During a 45-month follow-up period, 67 individuals died (8.3%). In a Cox proportional hazard model, MCI was associated with increased mortality (HR=1.71, 95% CI=1.06–2.76). However, this association disappeared when age, gender and comorbidities were added to the model (HR=1.05, 95% CI=0.63–1.76). Mortality was highest in the MCIm subtype (HR=0.45 95% CI=0.11–1.87 for aMCIs, HR=1.51 95% CI=0.75–3.07 for nMCIs, HR=2.54, 95% CI=1.47–4.38 for MCIm). However this association also disappeared after adjusting for age, gender, and comorbidities (HR=0.32, 95% CI=0.08–1.35 for aMCIs, HR=0.98, 95% CI=0.47–2.01 for nMCIs, HR=1.44, 95% CI=0.80–2.60 for MCIm).
Conclusion: MCI was not an independent risk factor for mortality in Korean elders.

P2007

Benefits of combination treatment in Alzheimer's disease

S. Gauthier
MCSA Alzheimer's Disease Research Unit, McGill Centre for Studies in Aging, Verdun, QC, Canada

Background: Alzheimer's disease (AD) is a neurodegenerative disorder in which cognitive, functional and behavioural abilities progressively decline over a period of years. Consequently, successful treatment strategies should encompass both short-term and sustained effects. Here, published studies of combination therapy in AD are reviewed.
Results: In a 6-month study, patients with moderate to severe AD were randomised to treatment with memantine (NMDA-receptor antagonist) or placebo, on top of existing stable treatment with donepezil (cholinesterase inhibitor, ChEI). Combination treatment with memantine+donepezil produced significant benefits across all domains – cognition, function, behaviour, global outcome, and care dependency – compared with donepezil alone. These results are supported by recent long-term data. In one study, AD patients receiving combination treatment with memantine+ChEI showed significantly slower cognitive and functional decline compared with patients receiving ChEI treatment alone ($p<0.001$), and untreated patients ($p<0.001$). The size of this treatment effect increased over time, and was sustained over 4 years. In a patient cohort from another long-term study, while ChEI treatment alone reduced the risk of nursing home admission, this effect was significantly augmented (by a factor of 7) in patients receiving combination treatment with memantine+ChEI. Pre-clinically, the combination of acetylcholinesterase inhibition and NMDA receptor modulation has been shown to produce a synergistic enhancement in acetylcholine levels, which may explain the observed clinical effects of combination treatment.
Conclusion: Combination treatment with memantine+ChEI produces consistent benefits that increase over time, and that are beyond those of ChEI treatment alone. These findings support the earlier initiation of combination treatment in AD.

P2008

Instrumental activities of daily living in Parkinson's disease dementia and Alzheimer's disease: relationship to motor disability and cognitive deficits

I. Rektorova[1], H. Rasovska[2]
[1]*First Department of Neurology, Masaryk University and St. Anne's Hospital Brno,* [2]*Medical Faculty of the Masaryk University, Brno, Czech Republic*

Objective: Functional decline is required for the diagnosis of dementia. Our objective was to compare functional disability in age- and dementia duration-matched patients with mild to moderate Parkinson's disease dementia (PD-D) and Alzheimer's disease (AD), and to assess which factors contribute specifically to the impairment of instrumental activities of daily living (IADL) in each patient group.
Methods: 18 PD-D subjects and 30 AD subjects were enrolled. Cognitive performance, neuropsychiatric symptoms, IADL and motor disability were assessed using the Mini-Mental Status Examination (MMSE), four subtests of the seven minute screen (7MS), the modified Lawton's IADL scale, and the Hoehn and Yahr (H-Y) score.
Results: There were no differences in IADL abilities between the two patient groups. We demonstrated a significant association between IADL and cognitive impairment as measured by the MMSE ($r=0.84$, $p<0.01$), Benton's temporal orientation ($r=-0.73$, $p<0.01$), verbal fluency ($r=0.74$, $p<0.01$), and a clock drawing test ($r=0.68$, $p<0.01$) in the AD group. In the PD-D group, IADL scores were significantly correlated only with PD duration ($r=-0.73$, $p<0.01$) and the H-Y score ($r=-0.59$, $p<0.01$).
Conclusion: Our study clearly shows that motor disability is a major contributor to IADL impairment in PD-D.

P2009

Behavioural symptoms, caregivers' distress and their response to galantamine treatment in patients with mild to moderate Alzheimer's disease: a pooled analysis

M. Gaudig[1], S. Kavanagh[2], B. van Baelen[3], M. Adami[4], P. Motlagh[5], A. Delgado[6], C.I. Guzman[7], B. Schaeuble[8]
[1]Medical Affairs, Janssen Cilag GmbH, Neuss, Germany, [2]PRD Beerse, Beerse, [3]Statistics, SGS Life Sciences Services, Mechelen, Belgium, [4]Medical Affairs, Janssen Cilag Italy, Milan, Italy, [5]Janssen Cilag France, [6]Medical Affairs, Janssen Cilag France, Issy-les-Moulineaux, France, [7]Medical Affairs, Janssen Cilag Spain, Madrid, Spain, [8]EMEA Medical Affairs, Janssen Cilag GmbH, Neuss, Germany

Aim: To characterize non-cognitive treatment response to galantamine therapy in patients with mild to moderate Alzheimer's disease (AD)
Methods: Pooled data of three randomized placebo-controlled trials (≤6 months duration) in patients with mild to moderate AD receiving maintenance doses of galantamine 16-24mg/day. Assessments included changes from baseline in the 10-item, care giver rated NPI to assess behavioural disturbances and on the NIP-D rating scale to explore care giver distress.
Results: In a pooled analysis of the three placebo-controlled trials (one 5-month and two 6-month; n=1918), galantamine was shown to produce significant benefit on behavioural symptoms, compared with placebo ($p<0.05$ [Observed Case analysis, OC]. In terms of disease severity, the greatest benefits were seen in the moderate ($p<0.01$, OC) and advanced moderate ($p<0.001$) sub-groups. Using the NPI-D scale to measure caregiver distress, mean treatment difference (SE) versus placebo were -0.3 (0.25; ITT (LOCF)) and -0.5 (0.28; OC), respectively for the overall group. Treatment effect was highest in caregivers of patients with advanced moderate AD ($p<0.001$, OC).
Conclusion: Galantamine might reduce care giver burden and behavioural symptoms in patients with mild to moderate AD. Effects were most pronounced in patients with advanced moderate Alzheimer's disease.

P2010

Memantine and prevention of worsening in functional communication: post hoc analysis of a randomized, placebo-controlled trial in patients with moderate Alzheimer's disease

S.M. Graham[1], M. Tocco[1], S. Hendrix[2], R.K. Hofbauer[1], J.L. Perhach[1]
[1]Forest Research Institute, Jersey City, NJ, [2]Pentara Corporation, Salt Lake City, UT, USA

Background: In a previously reported, 12-week, international, double-blind, randomized trial (MEM-MD-71; NCT00469456) in moderate AD (MMSE 10-19), in which cholinesterase inhibitor treatment was permitted, memantine (20mg/day; ITT n=133) was superior to placebo (ITT n=124) at improving caregiver-recognized functional communication. Here we focus on patients from that trial who declined on one of two functional communication measures: the Functional Linguistic Communication Inventory (FLCI), and the combined Social Communication and Communication of Basic Needs subscales of the American Speech-Language-Hearing Association-Functional Assessment of Communication Skills of Adults scale (ASHA-FACS).
Methods: In this post hoc analysis (LOCF), we used Generalized Estimating Equations to compare treatment groups (at endpoint and overall) in terms of patients whose changes on the FLCI or the ASHA-FACS subscales indicated any worsening, (<0, both measures), greater-than-mild worsening (decline of more than 0.5 standard deviations: FLCI, < -3; ASHA-FACS, < -10), or greater-than-moderate worsening (decline of more than 1.0 standard deviation: FLCI, < -6; ASHA-FACS, < -20).
Results: On the FLCI, treatment groups did not differ significantly in the proportion of patients who experienced any decline (endpoint and overall); however, a significantly greater percentage of placebo-treated patients experienced greater-than-mild worsening at endpoint ($p=0.032$) and overall ($p=0.013$), and greater-than-moderate worsening at endpoint ($p=0.039$). On the ASHA-FACS, significantly more caregivers of placebo-treated patients reported any worsening overall ($p=0.013$), greater-than-mild worsening at endpoint ($p=0.012$) and overall ($p=0.018$), and greater-than-moderate worsening at endpoint ($p=0.011$).
Conclusion: Memantine treatment of patients with moderate AD may be associated with a prevention of worsening in functional communication.

P2011

Neuropsychological staging of Alzheimer's disease (AD)

G. Gainotti, D. Quaranta, M.G. Vita, C. Marra
Department of Neuroscience, Catholic University, Rome, Italy

Objectives: To define the steps of neuropsychological AD progression.
Material and methods: 405 subjects with probable AD were evaluated using a neuropsychological battery including: MMSE, Rey's Auditory Verbal Learning Test (RAVLT), MFTC, Raven's Matrices (PM'47), phonological and semantic fluency, copy of figures, digit span forward/backward, Stroop test. According to MMSE, subjects were stratified for severity into four groups: Group A (MMSE>23); Group B (19<MMSE<22); Group C (15<MMSE<18); Group D (MMSE<15). For any patient the number of pathological tests (PP) was computed after age and education correction. Frequencies were compared by chi-square, with Bonferroni's correction (significance level: p=0.001). Tests displaying a significant difference of PP incidence between contiguous groups were considered as markers of progression.
Results: In Group A pathological scores were obtained only on the RAVLT delayed recall. The following markers of progress were identified: – a higher incidence of PP on PM'47 (chi2=20.864, p<0.001) and semantic verbal fluency (chi2=10.395 p<0.001) in Group B ; – a higher incidence of PP on copy of figures with landmarks (chi2=16.865, p<0.001) and RAVLT-immediate recall (chi2=10.586, p=0.001) in Group C; – a higher incidence of PP on phonological fluency (chi2=10.101, p<0.001) and digit span backward (chi2=16.375, p<0.001) in Group D.
Discussion and conclusion: Specific neuropsychological steps could define the progression of AD. After the initial defects of episodic memory, deficits in semantic knowledge and abstract reasoning, then deficits in simple constructive abilities and finally deficits in working memory and verbal initiation are sequentially observed.

P2012

Impact of memantine initiation on the Alzheimer's disease course: experience from the REAL.FR cohort

S. Andrieu[1,2,3,4], S. Bineau[5], C. Cantet[1,2,3], C. Guilhaume[5], B. Vellas[1,2,3], and the REAL.fr Group
[1]Gérontopôle, [2]Inserm U558, [3]University of Toulouse III, [4]Department of Epidemiology and Public Health, Toulouse University Hospital, Toulouse, [5]Global Outcomes Research Division, Lundbeck SAS, Issy-les-Moulineaux, France

Background and purpose: Memantine efficacy in moderate to severe Alzheimer's disease (AD) has been demonstrated in the experimental setting of clinical trials. Objective of this study was to assess its real-life effectiveness.
Methods: The REAL.FR study is a multicenter prospective cohort of AD-community-living patients recruited between 2000 and 2002 and followed every 6 months up to 4 years. Patients starting memantine were selected for a before/after comparison. Cognitive status (MMSE), functional abilities (basic and instrumentals ADLs), behaviour disturbances (NPI), caregiver burden (Zarit) and drug intake were compared between the 6-month periods before and after memantine initiation. Statistics used were MacNemar test for categorical variables and Wilcoxon-signed-rank test for continuous variables.
Results: 100 AD patients initiated memantine, 2/3 female, mean age 78 (SD 6.5). Average time since AD diagnosis was 4 years (SD 1.4) and mean MMSE score 12.1 (SD 5.5). Selected study sample comprised 37 patients seen 6 months before and after memantine initiation, stable under AChEI (89% before, 81% after). Comparisons of clinical evolutions showed a significant slowing of cognitive decline (ΔMMSE score before=-3.3 points and after=-0.97, p<0.001) and a significant stabilization of caregiver burden (ΔZarit score before=+5.8 points and after=-1.5, p=0.03). NPI and ADL scores were also improved, yet not significantly.
Conclusions: This observational study shows that in routine clinical practice memantine initiation seems to be effective in slowing clinical progression in patients suffering from AD. Further analysis with a larger study population is needed to support these findings.

P2013

Effects of memantine treatment on language abilities and functional communication in patients with moderate to severe Alzheimer's disease: a review of data

M. Tocco, S.M. Graham
Forest Research Institute, Jersey City, NJ, USA

Background: This review summarizes data from memantine trials in moderate to severe Alzheimer's disease (AD), in which language and functional communication (FC) were examined.
Methods: Protocol-based and post-hoc analyses of double-blind, placebo-controlled trials measuring the effects of memantine treatment on language and FC in patients with moderate to severe AD were reviewed. Post-hoc analyses measured language abilities using the Severe Impairment Battery (SIB) language domain and individual SIB items, while caregiver ratings of patients' FC were examined by combining communication-related items from the AD Cooperative Study-Activities of Daily Living scale (ADCS-ADL19) and the Behavioural Rating Scale for Geriatric Patients (BGP). Prospectively, language was assessed using the Functional Linguistic Communication Inventory (FLCI) and the Verbal Fluency Test (VFT). Caregiver assessment of FC employed the combined subscales of Social Communication and Communication of Basic Needs, from the American Speech-Language-Hearing Association Functional Assessment of Communications Skills for Adults (ASHA-FACS). For each measure, change from baseline at study endpoint (week 12 or 24) and overall was compared between treatment groups using ANCOVA models (LOCF, OC, or MMRM).
Results: In the post-hoc analyses, memantine-treated patients significantly outperformed placebo-treated patients on the SIB language domain and items, and on the ADCS-ADL19/BGP items. These findings were consistent with protocol-based endpoints: memantine-treated patients outperformed placebo-treated patients on both patient (FLCI and VFT) and caregiver-informed FC measures (ASHA-FACS subscales).
Conclusions: Evidence from multiple trials suggests that, in patients with moderate to severe AD, memantine treatment is associated with improvements in language and functional communication, compared with placebo treatment.

P2014

Memantine treatment benefits the language function in patients with moderate to severe Alzheimer's disease

S. Ferris[1], R. Ihl[2], P. Robert[3], B. Winblad[4], S. Gauthier[5], F. Tennigkeit[6]
[1]New York University Langone Medical Center, New York, NY, USA, [2]Maria-Hilf Hospital, Krefeld, Germany, [3]Memory Center, CHU-Université de Nice Sophia Antipolis, Nice, France, [4]Karolinska Institutet, Alzheimer Center, Stockholm, Sweden, [5]McGill Centre for Studies in Aging, Verdun, QC, Canada, [6]Merz Pharmaceuticals GmbH, Frankfurt/Main, Germany

Introduction: Language impairment is one of the most striking and distressing manifestations of Alzheimer's disease (AD). In this study, the post-hoc analysis of the Severe Impairment Battery – Language (SIB-L) data aimed to assess memantine efficacy for reducing language worsening in patients with moderate to severe AD.
Methods: A combined database from three placebo-controlled memantine clinical trials (IE2101, MD-01, MRZ9605) was established, including 560 patients with moderate to severe AD (baseline MMSE <15, SIB-L score ≤37). The patients were treated with 20mg memantine or placebo for 24/28 weeks. Clinically relevant worsening (a change from baseline on SIB-L ≤ -3.7) was assessed for the overall population (baseline SIB-L ≤37), for the subgroup with slight-to-substantial language impairment (baseline SIB-L >20) and for the subgroup with marked language impairment (baseline SIB-L ≤20). Single items responder analysis was performed in which any change from baseline on an SIB-L item <0 was considered worsening.
Results: After 24/28 weeks of treatment, a significantly higher number of memantine treated patients experienced improvement (a change from baseline on SIB-L ≥3.7) compared to placebo. Respectively, lower number of memantine vs. placebo treated patients experienced worsening. A beneficial memantine effect for preventing worsening of language abilities was demonstrated only for the SIB-L ≤20 subgroup. Two SIB-L items, repetition (item 11a) and confrontational naming (item 20), demonstrated a significant effect of memantine on reducing language worsening.
Conclusion: Memantine benefits language improvement and prevents worsening of language abilities in patients with moderate to severe AD.

P2015

Treating dementia in Hungary

T. Kovács[1], A. Ajtay[2], D. Bereczki[1]
[1]Department of Neurology, Semmelweis University, [2]National Health Insurance Fund Administration, Budapest, Hungary

Introduction: The disease burden of dementia is an important health policy issue in the developed world. In Hungary, the lack of data on the epidemiology and disease burden of dementia makes it difficult to create a sustainable long-term health strategy. In our previous study (Érsek et al, 2010) we found that the estimated cost of dementia is approximately 6,400 Euros/year/patient.
Objective: To estimate the burden of dementia on the in-patient system and to define the number of patients taking specific anti-dementia drugs.
Methods: We used data from the National Health Insurance Fund Administration (the only health insurance provider in Hungary) covering 2008.
Results: 19,504 patients were hospitalized because of dementia for 127,453 acute and 191,528 chronic care days; among them 2,733 died in hospital (14%). In addition, 48,439 patients with dementia as an accompanying disease were hospitalized for 283,492 acute and for 273,666 chronic care days; among them, 8,815 patients died in hospital (17.5%). 47.2% of the patients were treated in psychiatric, 21.4% in general medical and 14.1% in neurological wards. Specific anti-dementia drugs (cholinesterase inhibitors and memantine, in the recommended minimal therapeutic dose, in patient years) were prescribed for 1,448 and 1,174 patients with Alzheimer's disease (AD), respectively, covering only about 1.5% of the AD patients (estimation based on EuroCoDe data).
Conclusion: Our data show that dementia in Hungary is a major health issue with several unmet needs and the proportion of the treated AD patients is the lowest in the European Union.

P2016

The polymorphism of the ATP-binding cassette transporter 1 gene modulates Alzheimer's disease risk in Chinese Han ethnic population

Z.-Y. Wu[1], Y.-M. Sun[2], Q.-H. Guo[2]
[1]Neurology, [2]Huashan Hospital/Fudan University, Shanghai, China

Recent studies highlight a potential role of cholesterol metabolic disturbance in the pathophysiology of Alzheimer's disease (AD). The adenosine triphosphate (ATP)-binding cassette transporter 1 (ABCA1) gene resides within proximity of linkage peaks on chromosome 9q influence AD and plays a key role in cellular cholesterol efflux in the brain. Here, we studied the role of R219K and V825I polymorphisms of ABCA1 in modulating the risk of AD in 321 AD patients and 350 controls of Chinese Han. Genotyping of R219K and V825I were performed by PCR-restriction fragment length polymorphism (RFLP) analysis. The genotype distribution of R219K was different with more RK in total AD group ($\chi 2=8.478$, $p=0.014$), late-onset AD (LOAD) group ($\chi 2=10.636$, $p=0.005$), female AD group ($\chi 2=8.098$, $p=0.017$) and APOE non-$\epsilon 4\epsilon 4$ group ($\chi 2=9.664$, $p=0.008$). Logistic regression manifested the risk of AD increased in RK carriers in total AD group ($p=0.015$, OR=1.536, CI=1.087-2.170), LOAD group ($p=0.005$, OR=1.921, CI=1.213-3.041), female AD group ($p=0.007$, OR=1.836, CI=1.179-2.859) and APOE non-$\epsilon 4\epsilon 4$ group ($p=0.013$, OR=1.576, CI=1.103-2.252). K allele (RK+KK) also increased the risk of AD compared with RR allele in LOAD group ($p=0.029$, OR=1.619, CI=1.050-2.497) and female AD group ($p=0.021$, OR=1.641, CI=1.078-2.498). However, no discrepancy was found in V825I. The results indicated the RK genotype or K allele (RK+KK) of R219K may relate to the development of AD in the east of China.

P2017

Functional activity in the diagnosis of mild cognitive impairment

K.W. Kim[1], J.W. Han[2], S.B. Lee[3], T.H. Kim[1], J.H. Park[4], J.J. Lee[5], Y. Huh[1], J.Y. Choe[1], Y.J. Do[1]
[1]Neuropsychiatry, [2]Seoul National University Bundang Hospital, Seongnamsi, [3]Psychiatry, Dankook University Hospital, Cheonan, [4]Neuropsychiatry, Jeju National University Hospital, Jeju, [5]Psychiatry, Kyungbook National University Hospital, Daegu, Republic of Korea

Background: The criterion on functional activity in the revised diagnostic criteria for mild cognitive impairment (MCI) seems to be conceptually and operationally problematic.
Aims: We investigated the predictive validity for dementia of the criterion on functional activity in the diagnostic criteria for MCI.
Method: 140 MCI patients who participated in the baseline study of the Korean Longitudinal Study on Health and Aging were followed for 1.57±0.24 years, and annual conversion rates to dementia (ACRD) were compared between the patients who fulfilled the criterion on functional activity of the revised diagnostic criteria for MCI proposed by the International Working Group on MCI and those who did not.
Results: The annual conversion rate to dementia (ACRD) of the MCI patients who satisfied the third criterion of the revised diagnostic criteria for MCI (4.76%, n=122) was lower than ACRD of those who did not (ACRD=33.07%, n=18). The ACRD of overall MCI patients were 8.64% (n=140). The third criterion on functional activity was a significant negative predictor of dementia after adjusting for age, gender, education, follow-up duration and the presence of the APOE ϵ4 allele (adjusted OR=0.08, 95% CI=0.02-0.31, -2 Log likelihood=82.599, df =6).
Conclusion: Re-revision of the criterion on functional activity may be warranted to solve its' conceptual and operational ambiguities.
Keywords: Mild Cognitive Impairment, Functional activity, Diagnostic criteria, Predictive Validity, Dementia.

P2018

Cognitive screening tests: can they really discriminate between individuals with and without dementia?

I. Uttner, S. Schulz, C.A.F. von Arnim
Universität Ulm, Ulm, Germany

Introduction: Increasing prevalence of Alzheimer's dementia (AD) and limited resources in outpatient care have encouraged the distribution of cognitive screening tests. Especially general practitioners tend towards an – often exclusive – usage of these instruments, in spite of its frequently unsatisfying accuracy regarding the differentiation between incipient AD, depression (MD) and age-associated memory impairment (AAMI).
Methods: 25 individuals – eight of them with probable AD – completed a neuropsychological follow-up two years after initial examination. Beside the cognitive part of the Alzheimer's Disease Assessment Scale (ADAScog), a 15-item version of the Boston Naming Test (BNT), a verbal fluency test, and the Clock Drawing Test (CDT) a memory based Testing-the-Limits (TtL) paradigm consisting of one pre-test (baseline) and two post-test conditions (reserve capacity) as well as the California Verbal Learning Test (CVLT) were administered. To evaluate if AD patients can be correctly identified on the basis of their present test performance, participants were classified by means of a hierarchical cluster analysis which was computed for each of the test procedures.
Results: The highest consistence with the original group affiliation was found for the TtL post-test 1 (7 correct and 0 false positive classified AD patients) and the CVLT recall (8:1). For the screening tests, relations of 4:18 (ADAScog), 5:8 (BNT), 5:2 (CDT), and 5:5 (fluency test) were found.
Conclusion: The findings confirm the limited accuracy of cognitive screening procedures in detecting dementia. Moreover, they suggest that a plasticity based TtL paradigm offers a powerful diagnostic alternative to traditional status-oriented tests.

P2019

Primary-process affective and intentional consciousness: new evidence for critical mesencephalic link to motor rather than sensory cortices in Alzheimer's patients with anosognosia

M. de Leonni Stanonik[1], M. Kofler[2], C. Licata[3]
[1]Neurology, George Washington University, Washington, DC, USA, [2]Neurology, Hochzirl Hospital, Zirl, Austria, [3]Cole Neuroscience Center, University of Tennessee, Knoxville, TN, USA

Anosognosia, the inability to recognize illness in one's self, can affect patients with Alzheimer's disease (AD) and complicate their management. Anosognosia can occur in the earliest stages of AD, and can affect more than 40% of patients. It is usually manifested in patients with AD as an unawareness of cognitive, especially memory deficits. Significant relationship between BOLD response during self-appraisal and self-awareness of deficit in MCI has also been reported which highlights the level of anosognosia as an important predictor of response to self-appraisal in cortical midline structures, brain regions vulnerable to changes in early AD. Moreover, correlation between the right prosubiculum amyloid plaque density and degree of anosognosia in AD patients is identified. The purpose of this study was to examine the relationship between the regional cerebral glucose uptake and the biological substrates, which underlie impairments in anosognosia in early AD patients. This report using 18FDG PET adds new evidence to identify focal reduction of glucose utilization in MCI and early AD patients exhibiting anosognosia. Glucose hypoactivity of the superior inferior ACC, thalamus, and superior colliculi was indicative of the inability to recognize the patients' own memory deficit. Given the role of the anterior cingulate cortex, thalamus in awareness and attention, anosognosia may represent a deficit in the ability of focusing selective attention on one's self. Identification of the subcortical areas of focal hypoactivity adds to the evidence that the deep tectal layers and adjacent PAG may be the neuroanatomical substrates of the intrinsic motor SELF.

P2020

EEG maps of resting state functional connectivity reveal a severe disruption of cortical networks in Alzheimer's disease

A. Guggisberg[1], L. Nahum[1], A. Wahlen[1], G. Gold[2], A. Schnider[1]
[1]Department of Clinical Neurosciences, [2]Department of Rehabilitation and Geriatrics, University Hospital of Geneva, Geneva, Switzerland

Introduction: The neural correlates of cognitive deficits in Alzheimer's disease (AD) are only partly understood. Since cognitive functions are mediated by spatially distributed neural networks, it seems necessary to take a global network approach to understand the phenomenology of the disease. This study aims to characterize changes in functional connectivity among brain regions.
Methods: 5 patients with probable AD according to the NINCDS-ADRDA criteria have been included so far in this ongoing project (age 77-83, Mini Mental Score 17-26). Spontaneous high-resolution EEG activity during rest was recorded. Neural activity in the brain was reconstructed with an adaptive spatial filtering technique. The imaginary component of the complex valued coherence was then calculated for pairs of brain voxels and used as an index of their functional connectivity. The results were compared to a young healthy control group (n=10, age 22-39) and to patients with unilateral territorial ischemic stroke (n=11, age 48-80).
Results: Patients with AD showed a profound decrease in functional connectivity as compared to both healthy controls and patients with focal ischemic lesions ($p<0.001$). This decrease was observed in the entire spectrum of oscillations between 1 and 20 Hz and concerned diffuse brain regions in the temporal, parietal and frontal lobes. In contrast, ischemic lesions produced a more focal decrease in functional connectivity that concerned only alpha frequencies.
Conclusions: AD patients have disturbed functional connectivity maps that markedly differ from healthy controls and stroke patients. They may help to understand the neural basis of cognitive deficits in AD.

P2021

P-300 wave potential as an electrophysiological marker of dementia

S. Jha, M.K. Ansari
Neurology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India

Background: P-300 wave is a long latency event related potential whose variability in dementia has been extensively documented. This study was conducted to observe changes in P-300 wave potential in dementia.
Material and method: We selected 125 patients having dementia from different aetiologies in age range of 54-67 years (mean 59.4±13.7). P-300 wave was measured using auditory stimulus as task relevant stimulus. Results were compared with 30 age matched control patients of neurological illness having no dementia, like minor psychiatric disorders, headaches and back aches of different variety. All patients were included using established standard clinical criteria.
Results: The P-300 wave could not be recorded in 15 patients and there was significant increase (more than 20ms) in latency and diminution in amplitude of P-300 potentials in 25 patients of dementia. Thus P-300 wave was significantly altered in 40 (32%) patients having dementia. There was no alteration observed in P-300 wave in any control.
Conclusion: We conclude that P-300 wave is significantly altered in patients with dementia and may establish itself as an electrophysiological marker of dementia.

P2022

A linkage between Alzheimer's disease and a common genetic polymorphism that is related to emotional memory

M. Tsolaki[1], M. Daniilidou[2], M. Koutroumani[2], E. Nikolakaki[2], N. Vlaikidis[1]
[1]3rd University Neurological Department, G. Papanikolaou Hospital, School of Medicine, Aristotelian University, [2]Laboratory of Biochemistry, Chemistry Department, Aristotelian University, Thessaloníki, Greece

It has been reported that the activation of noradrenergic transmission in the brain is responsible for memory-enhancing effect of emotional arousal. It has also been shown that a common variant of a2b-adrenergic receptor (ADRA2B) which consists of an inframe deletion of three glutamic acids (301-303) is accompanied by increase of enhanced emotional memory.
Objective: The aim of this study is to investigate the correlation between this polymorphism and Alzheimer's disease.
Methods: Memory testing and genotyping (PCR analysis) was performed in AD patients and healthy elderly people.
Results: The polymorphism was tested in 117 patients diagnosed with sporadic AD (34.4% males, 65.6% females, mean age: 70.84±5.52) and 85 normal controls (41.4% males, 58.6% females, mean age: 70.46±6.36). The two groups were age and sex matched. A significant correlation was found between the deletion and the two groups (AD carriers of the deletion: 28.2%, control carriers of the deletion: 42.35%, p: 0.036).
Conclusion: The ADRA2B deletion frequency is greater in healthy elderly than in sporadic AD patients. Given that the deletion affects the properties of the receptor and thereby increases the ADRA2B-dependent emotional memory, we suggest that this polymorphism may contribute to the protection of developing AD by continuous stimulation of the emotional memory mechanisms.

P2023

Dementia screening project in a population of elderly people attending municipal recreation centres

P. Sakka, E. Margioti, P. Zoi, M. Nikaki, V. Kamtsiadeli, M. Katsari, A. Vlachogianni, D. Potamianou, E. Danasi, C. Nikolaou
Athens Association of Alzheimer's Disease and Related Disorders, Athens, Greece

Objective: Athens Association of Alzheimer's Disease in collaboration with Athens Municipal Recreation Centres for the Elderly organized a project aiming to increase awareness and promote prevention of dementia. It included on site presentations about memory and dementia followed by memory testing offered to those interested.
Methods: Neurologists and cognitive psychologists visited 20 municipal centres in Athens and interviewed those elderly interested in memory evaluation. The objective was to explore memory problems in a population of 1,800 urban dwelling elderly people and to identify undiagnosed patients. Cognitive tests performed were Mini Mental State Examination (MMSE), Clock Drawing Test (CDT) and Geriatric Depression Scale – short version (GDS).
Results: 286 people were evaluable (250 women and 36 men). The average age was 73 (±6.7) years. The majority (57%) had completed 6 years of primary education. Although 70.1% reported memory dysfunction as the reason for taking the examination, mean MMSE score was 26.5/30 (±3.5) and 82% scored 25 and over. Mean CDT score was 5/10 (±3.3). According to the GDS scores, 66% of the participants had no depression, 22% had mild depressive symptoms while 11% showed severe depression.
Conclusion: Memory complaints of the elderly participants were not related to memory deficits confirmed by cognitive tests. The high percentage of the MMSE scores below the cut off value may be explained by the fact that many of the participants had already been facing memory problems. Regression analysis confirmed the detrimental effect of aging and low educational level on cognitive tests performance.

P2024

Cognitive-emotional stimulation in mild cognitive impairment

V. Kholin
Physiology and Pathology of CNS, SI 'Institute of Gerontology AMS of Ukraine', Kiev, Ukraine

Until now effectiveness of therapeutic intervention of mild cognitive impairment has limited effect. On the other hand, alternative non pharmacologic treatment strategies showed promising results. Purpose of this study was to estimate new training paradigm in elderly patients with mild cognitive impairment (MCI). Patients with MCI, (n=60) were randomly allocated to a treatment group (n=30) or control group (n=30). The program consisted of 30 days consecutive 1.5 hours training session. Each session started with positive emotion induction with subsequent cognitive function training (reaction time, frequency of events, time sequence, spatial memory, associative memory, working memory, maze navigation). At the end of the study cognitive function, emotional state and biological age of CNS was estimated. Compared to the control group, those who received the intervention reported significant improvement in all cognitive tasks that were trained. The main group showed significant improvement in MMSE total score (from 26.09±0.46 to 27.8±0.41, $p<0.05$). Positive dynamics were found in „attention and calculation" , "short term memory" and "language and praxis" subtests, $p<0.05$. Improvement was also found in depressive and anxiety symptoms in training group patients. The parameter of CNS biological age after training was significantly reduced in the main group, moreover were found significant negative correlation between the last one and MMSE total score. Results suggest that cognitive emotional stimulation is a quite effective intervention for improving the cognitive and emotional function in MCI patients and can be used as an instrument to increase brain reserve.

P2025

Mini mental state examination (MMSE) correlates with serum calcitonin gene related peptide (CGRP) levels in patients with cognitive dysfunctions

V. Papantoniou[1], A. Tsaroucha[1], A. Fothiadaki[1], T. Karianos[1], A. Archontaki[1], P. Valsamaki[1], G. Gerostergios[2], A. Rizoulis[3], N. Sifakis[1], A. Stipsanelli[1], A. Papadimitriou[3]
[1]*Nuclear Medicine, Alexandra University Hospital, Athens,* [2]*Psychiatric Clinic, Hospital of Tripoli, Tripoli,* [3]*Neurological Clinic, University of Thessaly, Larisa, Greece*

Aim: To assess the variation of CGRP neuropeptide expression between patients with different status of cognitive impairment and in healthy normal individuals in relation to age.
Materials and methods: 11 patients (mean age±sd: 79.5±19.2) were submitted to mini mental state examination (MMSE). Serum CGRP levels were measured with RIA method and compared (t-test) with normal controls (group c1, n=5) matched for age (mean age±sd: 72±15) and younger normal volunteers (group c2, n=5) (mean age±sd: 31.8±12) in order to evaluate change in CGRP expression with ageing. CGRP expression was correlated (linear regression analysis) with MMSE.
Results: MMSE evaluation for patients with cognitive dysfunction was (mean score±sd) 14±7.2 (range 12-24). CGRP in patients, group c1 and group c2 was (mean value±sd) 190±46.76, 128.8±24 and 89.7±33 respectively. CGRP levels in patients with dementia were significantly higher as compared to group c1 and c2 ($p=0.009$ and $p=0.0008$ respectively). Linear regression analysis revealed a significant coefficient of correlation between CGRP serum value and MMSE score in patients group ($r=0.854$, $p<0.0001$).
Conclusion: Serum CGRP is over expressed in patients with cognitive diseases. Its correlation with MMSE shows a decrease of CGRP along with the severity of the disease. CGRP seems to increase with age in the normal healthy population.

P2026

Measurement of the quality of life in Alzheimer's disease: factors influencing agreement between patients' reports and family-carers' reports

M. Gomez-Gallego[1], J. Gómez[2], M. Ato[2]
[1]*Catholic University of Murcia,* [2]*University of Murcia, Murcia, Spain*

Therapies and healthcare resources aimed at Alzheimer's disease (AD) patients are intended to improve their quality of life (QOL). Usually the ratings of QOL given by proxies are taken into consideration, although these may differ from patients' views. This study is intended to measure the agreement between patients' and proxies' views and to decipher meaningful factors that influence these views.
Methods: 102 community dwelling patients with mild-to-moderate AD and 102 carers were recruited. Patients' QOL was rated by the patients (QOL-ADp) and their carers (QOL-ADc). Additional measures included the Mini-Mental State Examination (MMSE), Neuropsychiatric Inventory (NPI), Clinical Insight Rating Scale (CIR) and Caregiver Burden Interview (CBI). Regression analyses were conducted with QOL-ADpc as the dependent variable and QOL-ADc as the independent variable, using the standardized residuals as a measure of concordance. Then multiple regression analyses were conducted with the residuals as dependent variable and MMSE, CIR, NPI, NPI-distress and CBI as independent variables.
Results: 17.6% of the QOL-ADpc variance was explained by QOL-ADp. NPI-lability and CBI were significant predictors of concordance ($p<0.05$) and there was a trend for NPI-anxiety to act as a predictor ($p=0.071$). NPI-lability was the most important predictor ($R2=0.23$; $\beta=-0.37$). Greater CBI was associated with more negative residuals ($R2=0.06$; $\beta=-0.226$). MMSE, CIR and NPI-distress did not predict significantly ($p>0.05$) the agreement.
Conclusions: Agreement between patients' and carers' ratings was poor. Care should be taken when using ratings of QOL made by proxies of patients with high levels of irritability as agreement was lower.

P2027

A retrospective chart review of course of hypertension in Alzheimer's disease patients

G. Devi[1,2], E. Shin[2], V. Lo[2], K. Doumlele[2]
[1]Department of Neurology and Psychiatry, New York University School of Medicine, [2]The New York Memory and Healthy Aging Services, New York, NY, USA

Introduction: Higher blood pressure (BP) levels have been associated with dementia, particularly for Alzheimer's disease. Therefore, a significant proportion of patients with AD are on antihypertensive medications. However, during the course of AD, BP levels decline due to a number of factors, including degeneration of brain stem autonomic neurons. Such changes appear to reduce and possibly eliminate need for antihypertensive drugs. Continued maintenance on antihypertensive medications in these situations may predispose patients to falls, fractures and episodes of confusion.
Objective: To determine the relationship between the progressions of Alzheimer's disease (AD) and pre-existing hypertension.
Methods: We retrospectively reviewed the charts of all patients diagnosed of possible or probable Alzheimer's disease using National Institute of Neurological and Communicative Disorders and Stroke and the Alzheimer's disease and Related Disorders Association (NINCDS-ADRDA) criteria from our own private clinical practice who had antihypertensive medications discontinued subsequent to being diagnosed.
Results: There were 16 patients with probable or possible AD who demonstrated a significant decrease in their BP requiring discontinuation of their antihypertensive drugs as their condition progressed. None of these patients experienced an increase in BP requiring reinstitution of their anti-hypertensives.
Conclusions: From a review of the literature and based on our small exploratory study, clinicians may do well to periodically reassess need for antihypertensive medications in patients with Alzheimer's disease.

P2028

Transcranial magnetic stimulation of deep brain regions in Alzheimer's disease

V. Vakhapova[1], A.D. Korczyn[2], A. Zangen[3]
[1]TAU, Petach Tikva, [2]Sieratzki Chair of Neurology, Tel Aviv University, Ramat Aviv, [3]Weizmann Institute of Science, Rehovot, Israel

Transcranial magnetic stimulation of deep brain regions (db TMS) is a novel method, able to either excite or inhibit selected regions of the brain, which may be effective in treating various brain disorders. We report here the results of a double-blind examination of bilateral stimulation of prefrontal and parietotemporal areas. 10 patients were included and treated for 16 weeks each, 1-3 times per week, at frequency 10Hz and intensity 10% above the motor threshold. Efficacy measured by changes of ADAScog and MMSE, showed a trend to clinical improvement. 2 patients reported significant clinical improvements. No significant adverse events were recorded. These preliminary data support continuation of the study.

P2029

Isolated bulbar paralysis in a patient with medullar tau pathology: a case report

J. Pretnar-Oblak[1], M. Zaletel[1], B. Meglič[1], T. Mohar Hajnšek[2], I. Hočevar Boltežar[3], M. Popović[2]
[1]Department of Neurology, Clinical Center Ljubljana, [2]Institute for Pathology, Medical University Ljubljana, [3]Department of Otorinolaryngology, Clinical Center Ljubljana, Ljubljana, Slovenia

Objective: We report a 77-year-old female patient who presented with a 6 year history of dyspnoea, stridor and dysphagia. Other than that her neurological status was normal. Contrast radiographical examination of swallowing showed retention of the contrast and weak peristaltic activity of the oesophagus. Extensive diagnostics including EMG, micro-EMG, ANCA were normal. MRI of the head showed atrophy of the temporoparietal region. Paralysis of both vocal folds was found and from time to time she needed mechanical ventilation. Tracheotomy was performed. Gradually dysphagia worsened and she became cachectic. In December 2007 the patient was admitted to the Intensive Care Unit of our Neurological Department because of another sudden respiratory failure. On admission she was mechanically ventilated, awake, cooperative, afebrile. CT scan of the head was interpreted as normal. Chest X-ray and a positive aspirate were diagnostic of pneumonia. After antibiotic treatment her clinical status improved. She was breathing unaided, talking and walking. The following day she unexpectedly died in her sleep. Histopathological examination disclosed extensive degeneration of the medulla by tau pathology. The majority of symptoms and signs could be explained by the medullary tau pathology.
Conclusion: This is the first case report of a patient with bulbar symptoms and signs, which could be explained by prominent tau pathology of the medulla. Whether medullary tau pathology in this case was a rare aberrant progression of Alzheimer's disease or a new presentation of tauopathy concomitant with subclinical Alzheimer's disease should be elucidated by additional studies.

P2030

Paraoxonase1 gene P.Q192r polymorphism and insulin resistance in dementia

M. Bednarska-Makaruk[1], T. Krzywkowski[2], M. Rodo[1], A. Graban[3], A. Bochynska[3], W. Lojkowska[3], W. Socha-Czechyra[1], D. Ryglewicz[3], H. Wehr[1]
[1]Department of Genetics, Institute of Psychiatry and Neurology, [2]Department of Biotechnology, Warsaw University of Life Sciences, [3]First Department of Neurology, Institute of Psychiatry and Neurology, Warsaw, Poland

An association of insulin resistance and dementia was observed by several authors. The activity of paraoxonase1 (PON1), the enzyme playing a protective role against oxidative stress, was decreased in demented patients. The aim of this study was to investigate relationship of PON1 Q192R polymorphism and insulin resistance in dementia. From 83 demented patients (40 with probable AD, 25 MD and 18 VaD) and 41 controls DNA was isolated and Q and R alleles of PON1 polymorphism were identified basing on Humbert et al. PCR-RFLP method (1993) with minor modifications. In the same subjects the following determinations were performed: serum fasting glucose, glucose 2 hours after 75g glucose load and fasting insulin using DRG ELISA kit. HOMA index was calculated. In the patients with dementia 40 QQ, 35 QR and 8 RR genotypes were identified. Statistically significant higher glucose after glucose load level, insulin level and HOMA index in carriers of the RR genotype in comparison with non-carriers were stated. The results show the association of p.Q192R PON1 polymorphism with insulin resistance. However due to the small sample size the results should be considered as preliminary.

P2031

Treating Alzheimer's disease beyond clinical trials: results from the Argentinean Cerebrolysin Registry (ACeR)

I. Previgliano[1], J. Kremer[2], G. Tiezzi[3], M. Tozzola[4], M. Bukler[5], A. Anderson[6], G. Rojas[7], M. Bosch[8], G. Albanese[9], M. Torres[10], R. Klein[10], C. Ponteville[11], Argentinean Cerebrolysin Registry
[1]Neurology, Maimonides University, Buenos Aires, [2]Neurology, Kremer Institute, Cordoba, [3]Neurology, ACeR, Rosario, [4]Neuropsychiatry, Tozzola Neuroscience Institute, [5]Psychiatry, ACeR, [6]Buenos Aires Neurological Institute, [7]Pharmacology, University of Buenos Aires School of Medicine, Buenos Aires, [8]Psychiatry, ACeR, Rosario, [9]Neurology, Hospital Argerich, [10]ACeR, Buenos Aires, [11]Mathematics, Biochemistry School University of Buenos Aires, Buenos Aries, Argentina

Background: Cerebrolysin (Ce) is a compound with neurotrophic activity. It has been shown to be effective in the treatment of AD in 7 Randomized Controlled Trials (RCT) and it is approved for clinical use in the country since April 2008. The aim of the study was to register patients' outcome before and after one month Ce treatment.

Methods:

Design : Observation study. Clinicians that treated at least 5 patients with the drug were invited to voluntarily participate. Inclusion criteria: AD or mixed dementia (MD) diagnosis. Data collected: age, sex, comorbidities, general and specific medication, MRI findings, MMS after and before, clinician's global impression (CGI) and adverse reactions. Statistical analysis: Wilcoxon test for paired samples.

Results: 11 clinicians sent information of 226 patients, 24 were excluded. Age 75.13±7.40, 50% females, AD 68%, MD 32%. AD major comorbidities: arterial hypertension (53%), diabetes (15%), myocardial infarction (14%), stroke (10%). AD medications: memantine (49%), donepecil (37%), rivastigmine (34%), galantamine (9%), associations (67%). MMS preCe 18.54±5.28 postCe 21.30±5.55 (Wilcoxon $p<0.001$). CGI: improvement (76%; cognition 53%, daily living activities 39%, behaviour 8%), no change (18%), worsening (3%). Adverse effects: 3% (bacteriemia and phlebitis in 2 patients, phlebitis in 2, asthenia post infusion in 1).

Conclusions: In this population Cerebrolysin treated patients showed a significant upgrading of 3 points in MMS ($p<0.001$) as well as a 79% improvement according clinician's global impression, mainly in cognition and daily living activities. Adverse effects were minor and did not lead to suspend Ce administration. These results are in accordance with RCT findings.

P2032

Argentinean Cerebrolysin Registry: relatives' and caregivers' opinion

I. Previgliano[1], J. Kremer[2], G. Tiezzi[3], M. Tozzola[4], M. Bukler[5], A. Anderson[6], G. Rojas[7], M. Bosch[8], G. Albanese[9], M. Torres[10], R. Klein[10], C. Ponteville[11], Argentinean Cerebrolysin Registry

[1]Neurology, Maimonides University, Buenos Aires, [2]Neurology, Kremer Institute, Cordoba, [3]Neurology, ACeR, Rosario, [4]Neuropsychiatry, Tozzola Neuroscience Institute, [5]Psychiatry, ACeR, [6]Neurology, Buenos Aires Neurological Institute, [7]Pharmacology, University of Buenos Aires School of Medicine, Buenos Aires, [8]Psychiatry, ACeR, Rosario, [9]Neurology, Hospital Argerich, [10]ACeR, [11]Mathematics, Biochemistry School University of Buenos Aires, Buenos Aires, Argentina

Background: Cerebrolysin (Ce) is a compound with neurotrophic activity. It has been shown to be effective in the treatment of AD in 7 Randomized Controlled Trials (RCT) and it is approved for clinical use in the country since April 2008. The aim of the study was to register patients' relatives and caregivers' opinion before and after one month Ce treatment.

Methods: Observation study. Before Ce administration a nurse determined Barthel Index (BI) (ADL) and Delta Score (DS) (ADL and cognitive evaluation). Three month after Ce a telephone interview was performed determining these scores again plus a subjective evaluation as bad, fair, good and very good.

Inclusion criteria: AD or mixed dementia diagnosis.

Data collected: age, sex, comorbidities, general and specific medication, MRI findings, MMS after and before, clinician's global impression (CGI) and adverse reactions. Barthel Index, Delta Score and family/caregiver impression.

Statistical analysis: Wilcoxon test for paired samples. Chi squared test.

Results: Data of 228 patients were initially collected, 31 were excluded, 22 for relatives' negative to bring information and 9 that did not answer. Age 75.13±7.40 y.o., 50% females. Mean BI preCe: 64.50±12.7 posCe: 72.81±13.50 (Wilcoxon $p<0.001$). Mean DS preCe: 37.99±5.32 posCe : 46.66±7.19 (Wilcoxon $p<0.001$). Family/Caregiver impression: bad 1%, fair 24%, good 59% and very good 16%. Grouping Good and Very Good results as positive it reached 77% (Chi Squared $p<0.01$).

Conclusions: Cerebrolysin treated patients showed a significant improvement in two different scales assessing activities of daily living and cognitive impairment. Family and caregivers impression were positive in 77% of cases.

P2033

The involvement of some central angiotensins in cognitive processes and oxidative stress in rats

A. Ciobica[1], I. Haulica[2], L. Hritcu[1], R. Popescu[2], W. Bild[2]

[1]Alexandru Ioan Cuza University, [2]Romanian Academy, Iasi, Romania

Background: Recent studies suggested that pharmacological manipulation of angiotensin ligands may be of clinical importance. Although angiotensin II is the major effector of the renin-angiotensin system (RAS), various other angiotensins are now recognized as being biologically active. Angiotensin (1-7) is considered to be an important peptide fragment of the RAS, because it has important actions which are often opposite to those of angiotensin II.

Methods: Losartan, PD 123177 (AT1 and AT2 antagonist), captopril (ACE inhibitor), angiotensin II and angiotensin 1-7 were administered in the left cerebral ventricle. Behavioural tasks included Y-maze task, passive avoidance and radial-arm-maze. We also assessed the levels of some enzymatic antioxidant defences like superoxide dismutase (SOD) and glutathione peroxidase (GPX), as well as lipid oxidation makers like MDA (malondialdehyde), from the temporal lobe.

Results: In Y maze, radial arm-maze and passive avoidance task the inhibition of Ang II and the administration of angiotensin 1-7 resulted in an increase of both short-term and long-term memory.

Alterations in the specific activity of the antioxidant enzymes were found in the temporal lobe of angiotensin II-treated rats. Also, the level of MDA was increased in angiotensin II treated rats. On the contrary, blocking of angiotensin II or administration of angiotensin 1-7 exerted antioxidant effects.

Conclusions: Manipulation of the central angiotensins might be considered as a therapeutic target in the treatment of cognitive dysfunctions. A better understanding of the interactions between the various angiotensins, memory processes and neuronal oxidative stress is necessary and may lead to new therapeutic treatments.

P2034

Anti-aging and neuroprotective role of curcumin in normal, aluminium accelerated and epileptic rat brains

D. Sharma, P. Sethi, A. Jyoti
School of Life Sciences, Jawaharlal Nehru University, New Delhi, India

Objective: To investigate the effect of dietary curcumin supplement on electrophysiological alterations normal aged brain, AlC3-acclerated aging parameters in the brain as well as experimental model of FeCl3-induced post-traumatic epilepsy in the CA1 and CA3 subfield neurons of hippocampal region of the rat brain known to involve in learning and memory functions.
Material and methods: Electrical activity in ageing rats and seizures in epileptic rats were monitored electrophysiologically by taking multiple unit activity. Oxidative products [Malonaldialdehyde, Carbonyl compound] cellular antioxidants (Superoxide dismuatse, Glutahione, Glutathione peroxidase, Glutathione-s-transferase), Na+, K+ ATPAse, and Protein kinase C were measured in all the experimental groups and their age-matched controls.
Results and discussion: Dietary curcumin treatment showed significant restoration in the age-related and Al-induced increased MUA along with its associated enzyme Na+,K+ ATPAse and PKC. In Curcumin fed post-traumatic rats both generation and progression of the epileptic seizures were inhibited and found to correlate positively with learning behavioural parameters assessed through Moris water Maze and Open Field test. Decline in MDA and Carbonyl compounds after curcumin treatment in all the three experimental models and increase in glutathione, GPx and GST activity.
Conclusion: Anti oxidative potential could be one of the potent mechanisms behind restoring the membrane electrical potential in normal and Al accelerated aged rats as well as suppressing the post-traumatic seizures in epileptic rats. Hence, curcumin could be one of the alternative and safe therapies for people suffering from age-related or post injury seizures.

P2035

Oral health behaviour in cognitive impairment patients (CIP) evaluated in the cognition and behaviour unit (BCU) of Clinico San Carlos Hospital (HCSC), Madrid, Spain

B. Santiago Perez[1], J. Rosado Olaran[1], A.M. Gonzalez Sanz[1], J.M. Guiu Guia[2], S. Manzano Palomo[3]
[1]Stomatology, Anatomy and Human Embryology Department, Rey Juan Carlos University, [2]Neuroscience Institute, Behaviour and Cognition Unit, [3]Behaviour and Cognition Unit, Neurology Department, Universitary Clinico San Carlos Hospital, Madrid, Spain

Background: Oral problems become more prevalent in demented people. From a socio-economic point of view, we need to implement educative strategies.
Methods: A cross-sectional epidemiological study was carried out to assess the oral health status in CIP. We recruited 127 patients in BCU-HCSC from June 2009 to January 2010. We selected Alzheimer's disease (AD) (NINCS-ADRDA criteria), mild cognitive impairment (MCI) (Petersen criteria), mixed and other dementias. We analysed age, sex, MMSE, GDS, oral hygienic behaviour, xerostomy and subjective self-perception of oral state. An informant consent was obtained. The study was approved by the Ethics Committee of HCSC.
Results: The mean age was 77.39 (63% females). We evaluated 40.9% AD (GDS4: 42.5%%); MCI: 27.6%, mixed: 20.5%, others: 9.4%. The mean of MMSE was 26.28 (MCI), 18.32 (AD), 20.15 (mixed). 84.8% did the hygienic behaviour themselves (GDS4: 29.2%, MCI 29.2%). All did it three or more times per day. The majority of the caregivers did it twice or less (p=0.000). The more severity of AD, the less hygiene behaviour frequency (p=0.04).The frequency of xerostomy is 38.4% (39.6% AD, 31.3% MCI) (p=0.43).The majority of the patients have a good subjective self-perception of oral state 48.5% of AD has bad self-perception (p=0.63).
Conclusions: When the oral health behaviour of cognitive impairment patients depends on the caregiver, its quality is worst (frequency). We must implement oral therapeutic and preventive strategies to improve the quality of life of the demented patients.

P2036

Hemodynamic correlates of vascular risk factors in patients with Alzheimer's disease

T. Yamazaki
Neurology, Institute for Brain and Blood Vessels, Akita, Japan

Background and objective: To clarify the hemodynamic correlates of vascular risk factors in patients with Alzheimer's disease (AD), the SPECT images were analyzed statistically according to the LDL-cholesterol/HDL-cholesterol (L/H) ratio, HOMA-R, brain natriuretic peptide (BNP).
Methods: The present study was based on 59 patients who were diagnosed as having a probable AD according to the NINCDS-ADRDA criteria. All patients underwent laboratory testings, neuropsychological evaluation including Min-Mental Exam (MMSE), MRI and 99mTc ECD SPECT. All patients were classified into 2 categories: those without cerebral vascular lesions (Group A) and those with cerebral vascular lesions (Group B). The statistical parametric mapping (SPM) was used in comparison of the hypoperfusion patterns of the SPECT images.
Results: The MMSE scores negatively correlated with L/H ratio ($p<0.01$) as well as with BNP ($p<0.01$), but not with HOMA-R. In Group B, MMSE score negatively correlated with L/H ratio ($p<0.01$) and HOMA-R ($p<0.05$). As compared with Group A, Group B showed a significant hypoperfusion in the inferior frontal and anterior cingulate gyri on SPM ($p<0.01$). Those with greater L/H ratio showed a significant hypoperfusion in the left anterior cingulate gyrus and the right frontal lobe on SPM as compared with those with smaller L/H ratio ($p<0.01$).
Conclusion: The frontal hypoperfusion which was associated with the increase in L/H ratio might modify the hemodynamic pathophysiology in elderly AD patients. The increase in BNP and L/H ratio that correlated with frontal hypoperfusion strongly indicates a possible participation of vascular factors in AD.

P2037

Study research on pharmacotherapy and psychosocial care for treatment of stress and depression in ageing

H.A. Rabbani
Mental Health, Former Prof. Univ. Iran, Paris, France

This paper is based on our clinical research in the psychogeriatric department, then on our experiences in elderly people housing and finally our theoretical studies on "Brain's ageing" (1998 – 2008) at Lariboisiere and Sainte-Anne Hospital Universities. The outcome of different events: wars, acts of terrorism, natural catastrophes, etc… have been widely studied (Rabbani H. 2007). This paper investigated the pharmacotherapy and psycho-social treatment of stress and depression in older people, following stressful life events and during their "normal and pathological" ageing. Our observations have shown that many of these people are suffering from depression and stress. The therapy and care of these patients, in some extreme cases, is not so easy. The prevalence of stress and depression is estimated to be about 55 to 60% higher in aged women than in men; they suffer, in some cases, from psychiatric and psychosomatic disorders. The use of antidepressants such as: Imipramine, Fluoxetin, etc… is well established. However, their side effects should be examined during treatment. The researches have shown that parallel to these antidepressants, we should also use, in many cases, psychosocial treatments. Family care, music and occupational therapy etc. are also recommended. The psychotherapy method, as noted by several authors (Rabbani H. et al. 1987), jointly used with pharmacotherapy, can play a role. Recently, innovative therapeutics have also been initiated, like pet therapy, which is wide-spread in some families. In conclusion certain forms of psychotherapy are also needed for treatment and reduction of stress and depression in the ageing.

P2038

Multi-voxel MR spectroscopic study of cingulate gyrus in patients with mild cognitive impairment

Z. Yang, R. Wu
Department of Medical Imaging, 2nd Affiliated Hospital of Shantou University Medical College, Shantou, China

Objective: The objective of this pilot study was to assess brain metabolites in the cingulate gyrus of patients with mild cognitive impairment (MCI) using multi-voxel MR spectroscopy.
Methods: The cognitive ability of the subjects were firstly assessed by Unified Alzheimer Disease Rating Scale (UADRS) in the department of Neurology. 5 MCI patients and 3 control subjects matched in age and education, were performed in the experiment. All data were acquired on a 1.5T GE signa HDx MR scanner, and then were processed using the SAGE analysis package on the ADW4.3 workstation. The peaks area and ratios to creatine (Cr) of N-acetyl aspartate (NAA), myoinositol (MI), and choline-compound (Cho) were measured in the cingulate gyrus.
Results: In MCI patients, NAA and NAA/Cr were decreased, and MI, MI/Cr, Cho/Cr were increased. The value of metabolites in MCI group vs. control group were as follows: NAA: 9,973.60±795.64 vs. 27,533.33±11,696.77 ($p<0.05$), MI: 5,804.00±3,773.98 vs. 34,540.00±5,544.92 ($p<0.05$), NAA/Cr: 1.42±0.40 vs. 2.25±0.42 ($p<0.05$), MI/Cr: 0.53±0.01 vs. 0.66±0.20 ($p<0.05$) and Cho/Cr: 0.66±0.20 Vs 0.85±0.50 ($p>0.05$).
Conclusion: The variation of the metabolites in the cingulate gyrus of patients with MCI were able to be detected. A decrease in NAA, NAA/Cr and an increase in mI/Cr may be observed in the early stages of dementia. Ratio measurements of these metabolites are contributed to MCI diagnosis.

P2039

The late first presentation of dementia patients to the neurologist in Romania

D. Reisz, M. Simu, D. Chirileanu
Department of Neurology, Victor Babes University of Medicine and Pharmacy Timisoara, Timisoara, Romania

The aim of the study is to evaluate the behaviour of Romanian patients with cognitive dysfunctions related to their first contact with the neurologist. In many rural areas it is considered that normal aging is correlated with cognitive decline and as such early signs of dementia are not recognised or are underestimated. Despite the fact that in the last decades, efforts to educate the population to recognise first signs of dementia have been made, we still assist to a very late presentation of patients with demential syndrome. The study is a retrospective analysis of the patients first taken to record in the last four years in Timisoara, Romania in a policlinic. All available data were analyzed statistically. In the studied sample, 62% were women and 38% men, the average age was 76 years, with a very tight distribution (var=7); 56% of patients were 70-79 y.o. There is a overrepresentation of the urban population (69% of the sample). At the first testing, 9% of patients had an MMSE of less than 10 points, 50% were between 10 and 19 points and 40% above 20 points. The late presentation is correlated positively with age, negatively with education and is more often in patients from rural areas. The correlations are not very high but significant. Comorbidities and their relation to late presentation were recorded. It is as such needed to increase efforts to educate the general population to recognise the early signs of dementia.

P2040

Mini-mental state examination in frontal dysfunction disorders: comparison between Parkinson's disease (PD) and normal pressure hydrocephalus (NPH) patients

P. Bugalho, L. Alves, O. Ribeiro
Centro Hospitalar de Lisboa Ocidental, Hospital Egas Moniz, Lisboa, Portugal

Objectives: PD is a degenerative disorder, whose symptoms are not exclusively caused by fronto-striatal dysfunction. NPH is a frontal disorder caused by mechanical disruption of fronto-subcortical fibres. Previously, we reported deficits on MMSE memory and visuo-constructive tasks on non-demented PD patients, which could be due either to early temporo-parietal or executive dysfunction. By comparing PD and NPH patients' performance on the MMSE, we tried to differentiate between both mechanisms.
Methods: 52 non-demented PD patients were compared to 20 non-demented NPH patients and a control group of 45 healthy controls (matched for age, education and disease duration) on MMSE performance. We tested differences in MMSE total and partial scores (ANOVA with post-hoc bonferroni analysis). $p<0.05$ was considered significant.
Results: NPH patients had significantly lower total and partial MMSE scores compared to PD and control groups. PD scored significantly lower than controls on recall and visuo-constructive ability tasks. Using the percentage of the total MMSE score represented by each of the five tasks, NPH and PD patients performed similarly, presenting significantly lower scores than the controls on language, recall and visuoconstructive tasks, with no significant differences between them.
Conclusion: Although NPH presented with lower global cognitive function than PD patients, both groups presented a comparable pattern of performance on the MMSE tasks. As NPH does not involve degeneration of cortical structures, these findings suggest that impairment on memory and visuo spatial tasks found on PD patients are also probably due to executive rather than temporo-parietal dysfunction.

P2041

Neuropsychological and neurophysiological aspects of MCI syndrome in arterial hypertension patients

N. Bachinskaya, E. Demchenko, K. Polyetayeva, V. Kholin
Institute of Gerontology AMS of Ukraine, Kiev, Ukraine

P2042

Postural responses in elderly with balance impairment to vestibular and proprioceptive stimulation

M. Šaling, M. Cingelova
University Hospital Bratislava, Bratislava, Slovak Republic

P2043

Study of the effects of ketamine on learning and memory in rats

D.P. Getova, N.D. Doncheva
Pharmacology and Clinical Pharmacology, Medical University of Plovdiv, Plovdiv, Bulgaria

P2044

Possible implications of nicotine in Parkinson's disease therapy

PA. Ciobica[1], L. Hritcu[1], M. Padurariu[2], Z. Olteanu[1], V. Artenie[1]
[1]Alexandru Ioan Cuza University, [2]Socola Hospital, Iasi, Romania

P2045

Frontal lobe function in individuals with AVIM [asymptomatic ventriculomegaly with features of idiopathic normal pressure hydrocephalus (iNPH) on MRI]

C. Iseki, Y. Takahashi, M. Wada, T. Kawanami, T. Kato
Department of Neurology, Hematology, Metabolism, Endocrinology and Diabetology (DNHMED), Yamagata University School of Medicine, Yamagata-City, Japan

P2046

Effect of donepezil on clinical and EEG spectral analysis improvement in Alzheimer's disease patients

I.T. Barbov
Dementia & Cerebrovascular Disease, Clinic for Neurology, Skopje, FYRO Macedonia

P2047

Clinical structure of dementia syndrome in Armenia

A. Avetisyan, R. Sargsyan, H. Manvelyan
Yerevan State Medical University, Yerevan, Armenia

P2048

Pyramidal-extrapyramidal syndrome in CADASIL

A. Graban[1], E. Lewandowska[2], M. Gugala-Iwaniuk[1], G. Witkowski[1], M. Bednarska-Makaruk[3], A. Rudnicka[1], T. Wierzba-Bobrowicz[2]
[1]First Department of Neurology, [2]Department of Pathomorphology, [3]Department of Genetics, Institute of Psychiatry and Neurology, Warsaw, Poland

P2049

Semantic dementia, parkinsonism and seizures – a case report

C. Nóbrega, C. Capela, R. Almeida, R. Pedrosa
Centro Hospitalar de Lisboa Central, EPE, Lisbon, Portugal

P2050

What explains discrepancies between Alzheimer's disease patients and professional carers on patients' quality of life?

M. Gómez-Gallego[1], J. Gomez-Amor[2], J. Gómez-Garcia[2]
[1]Catholic University of Murcia, [2]University of Murcia, Murcia, Spain

P2051

Identification of sphingolipids disorders by mass-spectrometry method in mice brain sections induced by TNF-alpha

A.V. Alessenko
Lab. of Neurolipidology, Institute of Biochemical Physics, Moscow, Russia

P2052

The great imitator

M. Michel, F. Bernasconi, H. Mekideche, J.-M. Annoni, T. Landis, M.-D. Martory
HUG, University Hospital and Medical Faculty of Geneva, Geneva, Switzerland

P2053

Metabolic changes in animal models of Alzheimer's disease measured by 9.4T magnetic resonance spectroscopy

J. Yao, X. Cheng, R. Wu
Department of Medical Imaging, 2nd Affiliated Hospital of Shantou University Medical College, Shantou, China

P2054

L-dopa responsive suspected dementia

R. Ali, A.J. Larner, M. Doran
Walton Centre for Neurology and Neurosurgery, Liverpool, UK

P2055

Abstract cancelled

P2056

Long-term therapeutical efficacy after Cerebrolysin treatment interruption in a transgenic model of Alzheimer's disease

E. Rockenstein[1], E. Pham[1], S. Micheal[1], E. Doppler[2], C. Inglis[1], M. Mante[1], A. Adame[1], H. Moessler[2], E. Masliah[1,3]
[1]Neurosciences, University of California San Diego, La Jolla, CA, USA, [2]EVER Neuro Pharma GmbH, Unterach, Austria, [3]Pathology, University of California San Diego, La Jolla, CA, USA

Movement disorders 2

P2057

Behavioural and cognitive profiles in early Parkinson's disease: evidence of a network between depression and apathy with different cognitive domains

M. Bianchi, A. Alberici, I. Delrio, E. Premi, E. Cottini, M. Cosseddu, B. Borroni, A. Padovani
Neurology Department, University of Brescia, Brescia, Italy

Background: In addition to extrapyramidal signs, Parkinson's disease is characterized by non-motor symptoms including behavioural abnormalities and cognitive decline, the latter being associated to dementia during disease progression.

Objectives: This study aimed to investigate which behavioural disturbances are most associated with PD in early stage of the disease, and how they can influence cognitive performances.

Methods: The study included a sample of 179 patients with Parkinson's disease. Neuropsychiatric symptoms were determined using neuropsychiatric inventory (NPI); Cognitive functions were accomplished by an extensive neuropsychological battery; the activities of daily living using BADL and the extrapyramidal aspects using the UPDRSIII scale. The data were analyzed using SPSS-PC.

Results: The patients showed few behavioural disturbances mainly characterised by apathy and depression. 114 of the 179 PD patients (63.7%) were neither apathetic nor depressed; 16 (8.9%) were apathetic but not depressed; 30 (16.8%) were depressed but not apathetic, 19 (10.6%) were both depressed and apathetic. The depressed patients were significantly impaired on tasks assessing verbal memory, while depressed/apathetic patients showed deficits on the Trail-Making Test part A. UPDRS-III score did not influence performance on cognitive tests.

Conclusions: This study suggests the existence of different cognitive networks in PD patients at an early stage of the disease, associated with specific behavioural disturbances, and independent of dopamine related circuits. Further longitudinal studies will demonstrate if patients with a single domain impaired in early stages of disease will develop dementia.

P2058

Do Parkinson's disease patients spontaneously disclose adverse drug reactions?

M.V. Rey[1], S. Perez-Lloret[1], N. Fabre[2], F. Ory[2], U. Spampinato[3], J.-L. Montastruc[1], O. Rascol[1]
[1]Clinical Pharmacology, [2]Neurology, CHU Toulouse, Toulouse, [3]Neurology, CHU Bordeaux, Bordeaux, France

Introduction: Underreporting of adverse drug reactions (ADRs) to the Pharmacovigilance system is generally >90%, which may be related to the lack of insight of patients about their presence.

Objective: To explore the gap in the frequency of ADRs to antiparkinsonians when explored by means of a full exhaustive questionnaire or by the patients' spontaneous disclosure.

Methods: Non-demented, non-operated Parkinson's disease outpatients of the Toulouse Movement Disorder Clinic were initially asked to disclose any "unpleasant effect in connection with their medication" during the last week. Afterwards, they were systematically questioned about the presence of a predefined list of common ADRs to antiparkinsonian. Only ADRs starting within 6 months after causative agent introduction were further analyzed. ADR severity was assessed by the usual pharmacovigilance scale (mild/moderate/severe) or by a patient's auto-administered 10-cm VAS scale. A complete medical and medication history was conducted and a full UPDRS was performed.

Results: 98 subjects were recruited (mean age was 67±10 years; 61% were males; mean PD duration was 10±6 years; UPDRS III was 24±9; they were on antimuscarinics [7%], MAOB-I [10%], amantadine [15%], COMT-I [21%], agonists [80%] or levodopa [90%]). 69 out of the 98 subjects (70%) had at least one ADR, but only 25 of them (36%) disclosed it spontaneously. Patients' failure to spontaneously disclose the ADRs was related to shorter disease duration ($p<0.05$) but not to severity of ADRs.

Conclusion: The gap between ADRs identified by the full questionnaire or by spontaneous patients' report was high. Longer disease duration predicted patients' failure to spontaneously disclose ADR.

P2059

Proteome analysis of the substantia nigra in patients with Parkinson's disease

V. Licker[1], L. Dayon[1,2], N. Turck[1], M. Côte[1], N. Rodrigo[1], D.F. Hochstrasser[1,3], P. Burkhard[1,4]
[1]Strutural Biology and Bioinformatics, University of Geneva, Geneva, Switzerland, [2]Proteome Sciences plc, London, UK, [3]Genetics and Laboratory Medicine, [4]Clinical Neurosciences, Geneva University Hospitals, Geneva, Switzerland

Background and aims: Neuropathological hallmarks of Parkinson's disease (PD) involve the massive degeneration of dopaminergic neurons in the substantia nigra (SN) coupled with the occurrence of Lewy bodies and neurites in surviving neurons. These inclusion bodies, composed of a large variety of proteins, are thought to play a key role in neurodegeneration. Proteomic technologies offer powerful tools to systematically characterise thousands of proteins (identity, amount, post translational modifications) in complex mixtures. To gain new insights into PD pathogenesis, we conducted an extensive proteomic investigation of nigral tissue in patients with PD.
Material and methods: Human SN samples were obtained at autopsy (post mortem delay <24h) from PD patients (n=5) and age-matched controls (n=5). Protein profiles of the two groups were analysed by two-dimensional gel electrophoresis and a novel tandem mass spectrometry (MS/MS)-based quantitative proteomic technique termed tandem mass tags (TMT), followed by MS/MS analysis.
Results: About 600 proteins were identified and quantified. Their functional classification reveals that 25% are involved in cellular processes thought to be critical to PD pathogenesis (protein folding, oxidative stress, protein degradation and intracellular signalling). Interestingly, our data show that PD cases present alterations in the expression pattern of a subset of proteins compared with control cases. Some of these proteins might be important players in PD pathogenesis, including CNDP2 involved in the catabolism of the antioxidant carnosine.
Conclusion: Further characterisation of selected candidate proteins should provide new clues on the molecular mechanisms at the basis of neurodegeneration in PD.

P2060

Predictors of impulse control disorders in MMPI-2 in patients suffering from Parkinson's disease: a pilot study

K. Farnikova, R. Obereigneru, P. Kanovsky
Department of Neurology, Palacky University, Medical School Olomouc, Olomouc, Czech Republic

Objective: To evaluate the specific scales of MMPI 2 questionnaire as detectors and predictors of the impulse control disorders (ICD) in patients with Parkinson's disease (PD).
Methods: 46 patients suffering from PD (13 with ICD and 33 without ICD) and 56 patients from a control group were studied with the Minnesota Multiphasic Personality Inventory MMPI-2. The domains with expected high sensitivity for apparent addictive behaviour were compared between these three groups. The mean disease duration and mean dose of levodopa in the PD group were recorded.
Results: There were 46 patients with PD and 56 patients from control group. ICD were identified in 13 patients. The mean age was 64.7 years in ICD group, 63.6 years in PD group without ICD and 58.0 years in control group. The mean disease duration was 11.2 years in ICD group and 5.5 years in PD group without ICD. The mean dose of levodopa was 853.8mg in ICD group and 501.1mg in PD group without ICD. Among scales with expected high sensitivity for apparent addictive behaviour we evaluated the scale predicative about self-control insufficient (DISC), social responsibility (Re), alienation self and others (Si3, AAS) and antisocial practises (APS). We found significantly higher scores in Si3 and AAS scales and a significantly lower score in Re scale in ICD group as compared to the other two groups. There were no significant differences in DISC and APS scales.
Conclusion: The MMSE-2 might be a good tool for detection and prediction of ICD in Parkinson's disease.

P2061

The influence of the renal excretion of anti-parkinsonian drugs in patients with Parkinson's disease associated with chronic kidney disease

M. Ryo[1], K. Akiyama[2], H. Mochizuki[1], F. Yoshii[3]
[1]Department of Neurology, Kitasato University School of Medicine, Sagamihara, [2]Department of Neurology, Shin-Totsuka Hospital, Yokohama, [3]Department of Neurology, Tokai University School of Medicine, Isehara, Japan

Background: Chronic kidney disease (CKD) is increasing in patients with Parkinson's disease (PD) in the recent aging society. Therefore we need to pay close attention when we prescribe the renal excretion type of non-ergot agonists for elderly patients with PD associated with CKD.
Objective: We investigated the frequency of CKD in patients with PD and also the relationship between CKD and daytime sleepiness which was often observed in PD patients prescribed non-ergot agonists.
Subject and methods: We enrolled 184 PD patients, 100 male and 84 female, with the age of 41-94 (average 68±10 ys). CKD was defined as eGFR below 60ml/min/1.73m^2. Daytime sleepiness was scored using the Japanese version of the Epworth sleepiness scale (JESS). We investigated the relationship between eGFR value and score of the JESS, in consideration for the medication, especially non-ergot agonist of anti-parkinsonian drugs.
Result: There was an inverse correlation between eGFR and age, but there were no CKD patients below 60 years old. However there were 12 CKD patients in their sixties, 13 CKD patients in their seventies and 12 CKD patients with the age of 80 and over. The JESS score showed statistically inverse correlation in patients taking Pramipexole. However, there was no relationship in patients taking Ropinirole. There is no significant relationship between the JESS score and doses of both Pramipexole and Ropinirole.
Conclusion: CKD is a common complication in elderly patients with PD. Caution should be paid in the use of non-ergot agonists in these patients.

P2062

Comparisons among responses to pramipexole extended-release as adjunctive treatment in Japanese and non-Japanese studies of advanced Parkinson's disease

A.H.V. Schapira[1], P. Barone[2], R.A. Hauser[3], Y. Mizuno[4], O. Rascol[5], M. Busse[6], C. Debieuvre[7], T. Kagimura[8], M. Sohr[6], K. Yoshikawa[8], W. Poewe[9], in the name of the Pramipexole ER Studies Group
[1]The Institute of Neurology, University College London, London, UK, [2]Università di Napoli Federico II-IDC Hermitage Capodimonte, Napoli, Italy, [3]University of South Florida College of Medicine, Tampa, FL, USA, [4]Juntendo University School of Medicine, Tokyo, Japan, [5]Clinical Investigation Center INSERM 9302 and UMR 825, Toulouse University Hospital, Toulouse, France, [6]Boehringer Ingelheim Pharma GmbH & Co. KG, Ingelheim am Rhein, Germany, [7]Boehringer Ingelheim France S.A.S., Reims, France, [8]Nippon Boehringer Ingelheim Co., Ltd., Tokyo, Japan, [9]Innsbruck Medical University, Innsbruck, Austria

Objective: To compare advanced Parkinson's disease (PD) and its response to pramipexole extended- or immediate-release (ER or IR) in Japanese and non-Japanese trials.
Methods: Japanese patients taking levodopa for advanced PD (with treatment problems, e.g., on-off phenomena, wearing-off) were randomized to adjunctive ER or IR for 12 DB weeks, titrated, if tolerated, to 4.5mg/day, then switched overnight to OL ER, followed by 4-week optimization. The trial resembled a study in Europe, India, the Philippines, and South Korea, involving optimized ER or IR for ≥18 DB weeks, and then an overnight switch assessed at 1 week.
Results: The Japanese 112 subjects differed from the non-Japanese 333 in being older (mean 67.5 vs. 61.8 years), preponderantly females (67.5% vs. 44.1%), and more recently diagnosed (mean 3.0 vs. 6.4 years). Baseline UPDRS II+III scores were lower (mean 32.5 vs. 41.3). The Japanese adjusted mean UPDRS II+III response to DB pramipexole was -13.6 for ER and -13.3 for IR. The non-Japanese responses were -11.0 and -12.8. Among 50 (of 56) Japanese DB ER patients who stayed on ER, the further response was -2.2. Among 53 (of 56) IR patients switched to ER, it was -0.2. Among 122 (of 161) non-Japanese ER patients who stayed on ER, the further 1-week change was 0.4. Among 138 (of 172) IR patients switched to ER, it was -0.1.
Conclusions: Despite differences in trial populations, responses to ER in advanced PD had comparable magnitudes in Japanese and non-Japanese studies and resembled those for IR.

P2063

Neuropsychiatric symptoms and associated caregiver stress in geriatric patients with Parkinson's disease dementia

M. Martínez[1], M. Menendez Gonzalez[2], R. Ribacoba[2], A. López-Muñiz[3]
[1]Geriatrics, Hospital Álvarez-Buylla, [2]Neurology, Hospital Alvarez-Buylla, Mieres, [3]Universidad de Oviedo, Oviedo, Spain

Objective: To explore the presence of neuropsychiatric symptoms in geriatric patients with Parkinson's disease dementia (PDD).
Methods: 100 geriatric patients (age 75 years old or more) with PDD were assessed using the 10-item Neuropsychiatric Inventory (NPI). Associations between the profiles and demographic and clinical variables were analysed.
Results: 81% of the patients presented at least one symptom on the NPI, 70% had two or more symptoms and 56% had at least one symptom with a score ≥4. The most common symptoms were apathy (50%), anxiety (46%) depression (54%) and hallucinations (32%). Patients with more severe dementia and advanced Parkinson's disease had more neuropsychiatric symptoms. Nearly 52% of the care givers reported at least one NPI symptom to be of at least moderate severe stress.
Conclusion: Neuropsychiatric symptoms are common in geriatric patients with PDD. The profile of these symptoms differs from that in other types of dementia but is similar with youngest PDD patients.

P2064

Cognitive frontal dysfunction is a common reason of progressive gait disorders in advanced Parkinson's disease

R.R. Khalimov, I.V. Litvinenko, A.A. Sakharovskaya
Neurology, Military Medical Academy, Saint Petersburg, Russia

Introduction: Freezing of gait (FOG), postural instability and gait difficulty (PIGD) are highly disturbing symptoms in advanced Parkinson's disease (PD). They are mostly unresponsive to dopaminergic therapy.
Aim: To evaluate influence of cortical dysfunction in progressive gait disorders in PD.
Materials and methods: 82 patients (36 women, mean age 68.8 years) assessed by UK Brain Bank criteria for PD (53 – non demented PD group, 29 – demented PD group with onset of dementia at least two years after parkinsonism), participated in the study. Motor, cognitive symptoms were analysed using clinical assessment and rating scales including the Hoehn&Yahr stage, the UPDRS, FOG scale, MMSE, clock drawing test (CDT), Frontal Assessment Battery (FAB). Statistical analysis was tested using multiple regression and Spearman correlation analysis.
Results: Positive correlation between FOG scores and following scales has been revealed: FAB (r=-0.41: p=0.008), CDT (r=-0.55: p=0.001) and MMSE («serial 7s subtraction») (r=-0.38: p=0.016), with HY stage disease (r=0.73: p=0.001) and L-dopa dose (r=0.46: p=0.003). Negative correlation between testing of FOG scale and MMSE (p>0.05) is revealed. UPDRS (part III) has revealed positive correlation with FAB (r=-0.34: p=0.37), CDT (r=-0.5386: p=0.001) and total MMSE scores (r=-0.53: p=0.001).
Conclusion: These findings indicate that therapy of gait disorders in advanced PD should include principles improving attention, frontal executive functions.

P2065

From the change of muscular pattern to the change of cortical activation: evidence of the central mechanism of idiopathic dystonia

P. Kanovsky[1], R. Opavsky[1], P. Hlustik[1], P. Otruba[1], M. Bares[2]
[1]*Palacky University, Medical School Olomouc, Olomouc,* [2]*Masaryk University and St. Anne's Hospital Brno, Brno, Czech Republic*

The central mechanism of idiopathic dystonia is presumed within the brain albeit no direct evidence of any brain structures involvement in the development of dystonic dyskinesia exists. We have consecutively done a series of experiments in which we aimed to describe the potential central mechanisms more precisely. There were four studies performed which used botulinum toxin A (BTX-A) injections in previously untreated patients to study the processes at different levels of the central nervous system. In the first study we recorded the changes of muscular pattern of dystonia following the injections. Then we studied the changes in the cortical activation, represented by the cortical components of somatosensory evoked potentials. Consequently we employed paired magnetic stimulation to assess the changes of intracortical inhibition, and finally we studied the changes of cortical activation using fMRI. The muscular pattern changed following the injections, and the phenomenon of "calling of the new muscles" was present. The abnormal cortical activation and intracortical inhibition have been "normalised" with respect to the side of dystonic symptomatology. The cortical activation also has changed or "normalised". We have concluded that the successful treatment with BTX-A can change the characteristics of dystonia by the affection of its generating structures. It seems that these are localized not only at subcortical, but also at cortical level. Supported by the grant IGA MZ CR NS9920.

P2066

Hemifacial spasm and reinnervation synkinesias: long-term treatment with two botulinum toxin A-preparations

K. Kollewe, B. Mohammadi, R. Dengler, D. Dressler
Neurology, Medical School Hannover, Hannover, Germany

Introduction: Botulinum toxin (BT) is considered the treatment of choice for hemifacial spasm (HFS) and reinnervation synkinesias (RS). We present 133 patients with HFS (n=97) and RS (n= 36) who have been treated with either Botox® (n=78) or Dysport® (n=55) exclusively for 6 years (range 2 to 12 years).
Methods: Dysport® was diluted in 2.5ml 0.9% sodium chloride solution to produce a concentration of 200 units/ml and Botox® in 4ml 0.9% sodium chloride solution to give a concentration of 25 units/ml. BoNT dose per treatment and per treated muscle, global clinical improvement (GCI; 0 to 3; 0=no effect, 3=marked improvement), side effects, latency and duration of response were recalled from our database. Statistical analysis was carried out using SPSS v 14.0 (SPSS, Chicago, IL).
Results: The Botox® dose was 21±8MU, the Dysport® dose 46±22MU. The therapeutic effect started after 7.1±2.3 days and lasted for 12.5±3.9 weeks. It was stable throughout the observation period in 85% of all patients. Adverse effects occurred in 5.4% of injection series. No patient terminated treatment because of unsatisfactory results. Secondary therapy failure did not occur.
Conclusion: With an effective conversion ratio of Botox®:Dysport®=1:2.56 there were no differences between both drugs with respect to therapeutic efficacy and adverse effects thus confirming the hypothesis that there may not be intrinsic differences between both products.

P2067

Prevalence and awareness of non-motor symptoms in de-novo Parkinson's disease patients

M. Relja, V. Miletić
Department of Neurology, School of Medicine, University of Zagreb, Zagreb, Croatia

Objective: The aim of this study was to investigate the prevalence and awareness of non-motor symptoms in de-novo Parkinsonian patients.
Background: The non-motor symptoms cause problems in the daily life of Parkinsonian patients and have a great impact on the quality of life (QoL). However, these symptoms are neglected by both patients and their doctors compared to motor symptoms.
Patients and methods: We evaluated 56 consecutive de-novo Parkinsonian patients. The diagnosis of Parkinson's disease (PD) was made under the diagnostic criteria of Gelb. We evaluated Hoehn and Yahr stage (HY), mini mental status examination (MMSE), Becks depression inventory (BDI) and duration of PD non-motor and motor symptoms. A survey of non-motor symptoms using NonMotor Symptoms Questionnaire (NMSQust) was performed in all patients.
Results and discussion: 56 de-novo PD patients were included in this study (30 males and 26 females, mean age 60.9+9.1 years). HY stage of the patients was from 1 to 3. The most frequent non-motor symptom was depression (45.3%). It was followed by constipation (35.3%), unexplained pain (29.3%) and sleep disturbances (23.2%). As many as 75% of patients did not recognize the connection between non-motor and motor symptoms. Results of this study indicate that non-motor symptoms were present in de-novo PD patients even prior the onset of motor symptoms. These symptoms are usually under-diagnosed and not adequately treated because they are not obvious as motor symptoms. To improve the treatment of PD patients, non-motor symptoms should be comprehensively assessed.

P2068

G2019S mutation is a very important cause of Parkinson's disease in Portugal

A. Morgadinho[1], M.R. Almeida[2], P. Coutinho[3]
[1]Neuology Department, Centro Hospitalar de Coimbra and Centro Hospitalar entre Douro e Vouga E.P.E., Coimbra and Santa Maria da Feira, [2]Centro de Neurociências e Biologia Celular, Faculdade de Medicina da Universidade de Coimbra, Coimbra, [3]Neurology Department, Centro Hospitalar entre Douro e Vouga, E.P.E., Santa Maria da Feira, Portugal

Introduction: Mutations in LRRK2 gene were initially identified in large families with autosomal dominant Parkinson's Disease (PD). The p.G2019S mutation was found to be a frequent cause of both autosomal dominant and "sporadic" PD, particularly in populations in the Middle East, southern Europe and Ashkenazi Jewish populations.
Objectives: To identify the p.G2019S mutation in a series of Portuguese PD patients with a positive family history and to make a clinical characterization of these patients.
Methods: We determined to test for G2019S mutation in a clinic case series of PD patients with a positive family history followed in the Movement Disorders Clinic at Centro Hospitalar entre o Douro e Vouga, E.P.E. during one year. After obtaining informed consent, a 10ml sample was taken, DNA extracted by standard procedures and afterwards we sequenced all 50 exons of the gene.
Results: In our series of 18 patients, 4 had the G2019S mutation. The age of the patients varied between 71 and 86 the age at onset of PD between 52 and 76. The first PD symptom was akinesia in one and tremor in 3. Two patients had dyskinesias, none had dementia. The UPDRS (in on) varies between 22 and 33.
Conclusions: Our results confirm that G2019S mutation is a frequent cause of PD in Portugal, with relevant implications for genetic counselling. We also have tried to prove that it is important to ask for a genetic test when PD patients have at least one relative with the disease.

P2069

Impulse control disorders associated with dopaminergic medication in pituitary adenomas: a case control study

J. Martinkova[1], L. Trejbalova[2], P. Valkovic[1], M. Sasikova[2], J. Benetin[1]
[1]2nd. Department of Neurology, Comenius University, [2]1st. Department of Internal Medicine, Slovak Medical University, Bratislava, Slovak Republic

Objective: The impulse control disorders (ICDs) associated with dopaminergic medication have recorded increasing interest during the past years, particularly in Parkinson's disease. Recently it has been reported the association between ICDs and other disorders treated with dopaminergic drugs (dopamine agonists) such as restless legs syndrome, multiple system atrophy, multiple sclerosis and fibromyalgia. This is the first study focused on incidence of ICDs in pituitary adenoma on dopamine agonists (DAs)
Methods: 20 consecutive patients with pituitary adenomas taking DAs have been investigated. All of them underwent short structured interview performed by "PD specialist" focused on ICDs (especially on pathological gambling, hypersexuality, impulsive shopping, impulsive eating).
Results: We detected one unique case of ICDs in a 35-year-old man with giant macroprolactinoma (49x42mm), who had developed abnormal behaviour after the onset of dopamine agonist treatment. He was alternately treated by different type of DAs (cabergoline, bromocryptine, quinagolid). During the cabergoline medication (5mg per week) he developed pathological gambling and impulsive eating as well, which disappeared after reduction of dosing and switching to another type of DA.
Conclusions: We report a unique case of ICDs associated with DAs therapy in pituitary adenomas. Our study demonstrates, that it is important to systematically screen patients treated with dopaminergic drugs for ICDs.

P2070

Impaired insulin sensitivity and secretion in normoglycemic patients with cerebellar ataxia type 1

N. Dragasevic[1], N. Lalic[2], E. Stefanova[1], A. Jotic[2], K. Lalic[2], T. Milicic[2], I. Petrovic[1], M. Macesic[2], V.S. Kostic[1]
[1]Department of Neurodegenerative Disorders, National Institute of Neurology, [2]National Institute of Endocrinology and Diabetology, Belgrade, Serbia

Objectives: We have recently shown an impairment in insulin sensitivity and insulin secretion in normoglycemic patients with Huntington's disease (HD). In order to investigate whether such observations are HD-specific or may be common to other polyglutamine diseases, we wanted to investigate glucose homeostasis in patients with spinocerebellar ataxia type 1 (SCA 1), another entity from the family of polyglutamine diseases.
Methods: Glucose homeostasis was studied in 12 unrelated, untreated normoglycemic patients with SCA 1 and in 24 healthy, matched controls. Metabolic investigations included
(a) glucose tolerance assessment based on glucose curve during oral glucose challenge;
(b) insulin sensitivity assessment by the homeostasis model assessment (HOMA) and the euglycemic insulin clamp (M value); and
(c) insulin secretion by acute insulin response (AIR) and insulinogenic index.
Results: The evaluation of insulin sensitivity demonstrated higher HOMA-insulin resistance indices, and lower M values ($p<0.001$ and $p<0.05$, respectively), while both the AIR and the insulinogenic index were lower in patients with SCA 1 compared to controls ($p<0.001$ and $p<0.05$), respectively).
Conclusions: Our data suggested an impairment in insulin secretion capacity, as well as simultaneous decrease in insulin sensitivity, with an increase in insulin resistance level in patients with SCA1.

P2071

A case of Huntington's disease phenocopy characterised by pallido-nigro-luysian degeneration with brain-iron accumulation and p62-positive glial inclusions

Z. Ahmed[1], S. Tabrizi[2], A. Li[1], H. Houlden[1], A. Sailer[1], A.J. Lees[1], T. Revesz[1], J.L. Holton[1]
[1]Molecular Neuroscience, [2]MRC Prion Unit, University College London, London, UK

Introduction: We present a 57-year-old male patient with an 8-year disease history, characterised by choreiform movements, postural instability, vertical gaze palsy and cognitive impairment. Genetic testing during life ruled out Huntington's disease and associated genetic disorders, resulting in a clinical diagnosis of Huntington's disease phenocopy.
Methods: Standard histological stains along with immunohistochemistry using a wide range of protein markers and confocal microscopy were utilised.
Results: Pathological examination revealed subthalamic nucleus atrophy associated with severe neuronal loss and gliosis. Although milder in severity, these latter features were also observed in the substantia nigra and globus pallidus, together with significant iron accumulation and axonal spheroids. Immunohistochemistry revealed sparse tau, α-synuclein and Aβ pathology consistent with ageing; however, we identified novel p62-positive glial inclusions (PGI), which were occasionally positive for ubiquitin and were argyrophilic as determined using Gallyas silver impregnation. These inclusions were consistently negative for tau, α-synuclein and other protein markers. Confocal microscopy indicated that p62-positive material was accumulating specifically in oligodendroglia. The density and distribution of PGIs appeared to mirror that of neurodegeneration, with the highest density found in the subthalamic nucleus. Other cortical, sub-cortical, brainstem and cerebellar nuclei were less severely affected.
Conclusion: A descriptive pathological diagnosis of pallido-nigro-luysian degeneration with brain iron accumulation and p62-positive glial inclusions was given. A more specific diagnosis awaits identification of the (currently unknown) protein inclusion. This study highlights the utility of p62-immunohistochemistry in the neuropathological investigation of HD phenocopies and pallido-nigro-luysian degeneration, especially when the aetiology is uncertain.

P2072

Non-motor features in Parkinson's disease associated with glucocerebrosidase mutations

A.E. Elia, B. Garavaglia, F. Del Sorbo, A. Albanese
Istituto Neurologico C. Besta, Milan, Italy

Background and aims: A recent finding is that carriers of a single heterozygous glucocerebrosidase (GBA) mutation present a significantly increased risk of developing Parkinson's disease (PD). Clinical data of PD patients who carry GBA mutations are scarce, particularly with regard to non-motor features. Objective of this study is to investigate autonomic and cognitive features in a large series of PD patients who carry GBA mutations.
Patients and methods: A series of 27 PD patients who carry GBA mutations in the heterozygous state (the L444P mutation in 17 patients and the N370S mutation in 10) were evaluated. Symptoms related to autonomic dysfunction were collected by structured interviews and cardiovascular autonomic tests, cognitive assessment was carried out by a neuropsychological battery.
Results: The mean age at onset of all carriers was 47.5±9.6 years and the mean disease duration was 9.5±7.5 years. Among carriers of the L444P mutation 11 patients presented a moderate to severe cognitive dysfunction and 9 developed behavioural symptoms. 6 patients complained of autonomic insufficiency, with orthostatic hypotension in 5 and urge incontinence in 6. Among carriers of the N370S mutation 4 patients presented behavioural symptoms consisting in a dopamine dysregulation syndrome with gambling in 1 patient, autonomic failure was present in 2 patients who complained both of orthostatic hypotension and urge incontinence.
Conclusions: These data confirm that PD associated with GBA mutations present a variable phenotype that deserves further analysis and classification. In heterozygous carriers non-motor symptoms are very common, particularly cognitive and behavioural symptoms.

P2073

Decreased cortical thickness on MRI in patients with fragile X premutation: preliminary experience

O. López-Mourelo[1], J. Pagonabarraga[1], L. Rodriguez-Revenga[2], M. Milà[2], Y. Vives[3], M. Delfino[3], E. Granell[1], J. Kulisevsky[1], B. Gómez-Ansón[1]
[1]Hospital Sant Pau, [2]Hospital Clinic, [3]PIC, Barcelona, Spain

Purpose: This study was conducted to explore differences in cortical thickness between Fragile X Premutation carriers (Fxpre) with or without the fragile X tremor ataxia syndrome (FXTAS) and healthy comparison subjects using cortical surface-based analysis.
Material and methods: Morphometric magnetic resonance imaging (MRI) methods were used to measure regional cortical thickness in 45 subjects, (31 with FX premutation and 14 healthy comparison subjects) matched for age and sex. MRI data were obtained on 3T Philips Intera 2.1. Cortical thickness was quantified using an MRI automatic software package (FreeSurfer), running on a GRID facility in a parallel environment. The results of the cortical thickness were verified by experts, and in some cases manual modifications were applied to obtain more accurate results. The FreeSurfer statistical package (QDEC tool) was used to perform the comparisons between groups. Significance was defined at $p<0.01$.
Results: Subjects with FXpre exhibited significantly decreased cortical thickness in right and left supramarginal cortex, right superior temporal cortex, right postcentral cortex, right superior frontal cortex, left lingual cortex and left rostral anterior cingulate cortex, relative to healthy comparison subjects (all $p<0.01$) (Table 1)

Brain Regions	Right hemisphere	Left hemisphere
Supramarginal	p<0.0062	p<0.0019
Superior temporal	p<0.0054	
Postcentral gyros	p<0.0077	
Superior frontal	p<0.0083	
Lingual		p<0.0066
Rostral anterior cingulate	p<0.0087	

Table1: Areas of significant cortical thinning in patients with FXpre relative to healtchy controls

Conclusions: Cortical thinning was present in multiple prefrontal cortices in Fragile X premutation carriers. These findings observed in the current study may be related to impairment of cognitive and emotional processing in FXpre but longitudinal studies will be necessary to test this hypothesis.

P2074

A randomized, placebo-controlled clinical trial to assess the effects of rasagiline in patients with multiple system atrophy of the parkinsonian subtype (MSA-P)

W. Poewe[1], S. Gilman[2], P.A. Low[3], O. Rascol[4], C. Sampaio[5], Y. Weiss[6], G.K. Wenning[7], K. Seppi[1], for the Rasagiline-for-MSA investigators.
[1]Department of Neurology, Medical University Innsbruck, Innsbruck, Austria, [2]Department of Neurology, University of Michigan, Ann Arbor, MI, [3]Department of Neurology, Mayo Clinic College of Medicine, Rochester, MN, USA, [4]Departments of Clinical Pharmacology and Neurosciences, CIC9302/UMR825, Faculty of Medicine, UPS Toulouse III, Toulouse, France, [5]Laboratório de Farmacologia Clínica e Terapêutica, Faculdade de Medicina de Lisboa, Lisbon, Portugal, [6]IR&D department, TEVA Pharmaceutical Industries, Netania, Israel, [7]Division of Clinical Neurobiology, Medical University Innsbruck, Austria

Background: MSA is a neurodegenerative disorder characterized by a combination of Parkinsonian, autonomic, cerebellar and pyramidal symptoms. Currently, treatment of MSA-P is limited to partially effective symptomatic therapies. Rasagiline is an MAO-B inhibitor indicated for the treatment of Parkinson's disease (PD). Preclinical studies in multiple models (including a transgenic mouse model of MSA) have demonstrated neuroprotective properties of rasagiline. The ADAGIO delayed-start study showed that early treatment with rasagiline 1mg/day slowed the clinical progression of PD.
Methods: Phase IIb, multi-centered (39 sites, 12 countries), randomized, double-blind study assessing the efficacy of rasagiline in ~140 subjects with possible or probable MSA-P. Subjects were randomized (1:1) to rasagiline 1mg/day or placebo for 48 weeks. Participation in an imaging sub-study using MRI-based indices of disease progression is on-going for approximately 25% of subjects. Primary endpoint is change from baseline to study end in the validated Unified Multiple System Atrophy Rating Scale. Other assessments include: Clinical Global Impression of Improvement, Composite Autonomic Symptom Scale-Select, Beck Depression Inventory, MSA Quality of Life scale, Montreal Cognitive Assessment Scale, orthostatic vitals and a weekly falls diary. Safety and tolerability will be assessed through AEs, ECG, labs, and percentage of subjects who discontinue.
Conclusions: This will be one of the largest placebo-controlled trials conducted to date in MSA-P and will be the first to use both clinical and imaging outcomes to assess the efficacy and impact of rasagiline on disease progression in this understudied condition. As of mid-March 2010, 41 patients have been enrolled.

P2075

Health-related quality of life in Huntington's disease

F. Januário[1], F. Júlio[2], C. Januário[3]
[1]Department of Physical Medicine and Rehabilitation, Coimbra University Hospital, [2]Institute of Biomedical Research in Light and Image, [3]Department of Neurology, Coimbra University Hospital, Coimbra, Portugal

Objective: Huntington's disease is a neurodegenerative disorder characterized by motor, psychological and cognitive symptoms, interfering in quality of life. The purpose of this study was to assess the health-related quality of life (HrQOL) in Huntington's disease outpatients of our Neurology Department.
Methods: Non-randomized clinical study with 23 consecutive outpatients having a diagnosis of Huntington's disease confirmed genetically in different stages of the disease. It included 10 women and 13 men, mean age 42.43±12.67 years who had a normal Mini-Mental State Examination. We used the Short-Form (SF)-36 and Unified Huntington's Disease Rating Scale (UHDRS).
Results: Comparing both SF-36 scores of the sample with the scores of normal Portuguese population there is a decrease in both mental and physical dimensions. UHDRS scores: motor 28.64±24.87; verbal-fluency 14.95±10.10 and symbol-digit 20.77±16.30; behavioural 17.22±11.86 and total functional capacity 9.52±4.38. UHDRS behavioural did not significantly correlate with any of the SF-36 sub-dimensions, but 70% of the patients have depression symptoms and 78% use anti-depressive therapies. The Partial Least Square Regression showed that the motor capacities influence mostly the physical dimension and the social functioning, but it is the functional ability that influences most the HrQOL.
Conclusions: These patients' perceptions of HrQOL are decreased, particularly by functional ability, justifying a global intervention (pharmacological, kinesiology and psycho-social).

P2076

Exclusion of linkage to chromosome 14q in Serbian family with idiopathic basal ganglia calcification

M. Jecmenica Lukic, I. Petrovic, V. Dobricic, I. Novakovic, V.S. Kostic
Movement Disorders Department, National Institute of Neurology, Belgrade, Serbia

Background: Fahr disease or IBGC is a very rare neurodegenerative syndrome that is associated with a variety of movement disorders and neurobehavioral and cognitive manifestations. Despite numerous clinical, pathological, and biochemical investigations, its etiology remains unknown. Familial IBGC usually follows an autosomal dominant pattern of inheritance. Despite mapping to chromosome 14q of a susceptibility locus for IBGC (IBGC1) in one family, this locus has been excluded in several others, demonstrating genetic heterogeneity in this disorder.
Methods: We have identified 6 members of one family in three generation with probable autosomal dominantly inherited IBGC. The diagnosis of IBGC was based on CT scans and we excluded all secondary causes of calcification in probands. We performed neurological, neuropsychological and psychiatric assessment in all patients in order to show heterogeneity in clinical presentation in the same family. Our genetic analysis was focused on testing the evidence for linkage to the IBGC1 locus on chromosome 14q, previously reported to be associated with familial IBGC, using the set of microsatellite markers (D14S596, D14S1014, D14S75, D14S306, D14S288, D14S259).
Results: We observed marked differences in clinical and radiological findings in three generations. 4 patients were presented with almost similar distributions of calcifications on CT scan, but 3 with mild hyperkinetic movements, and the others with severe gait disturbances. 3 of them were asymptomatic, with less prominent and different distribution of calcification on CT scans. In our genetic analysis, the IBGC1 locus was excluded in all 6 members of this family.

P2077

Risk factors for abnormal posture in Parkinson's disease

T. Oeda[1,2], A. Umemura[1,2], S. Tomita[1,2], R. Hayashi[1,2], M. Kousaka[2], K. Yamamoto[1,2], H. Sawada[1,2]
[1]Clinical Research Center, [2]Neurology, Utano National Hospital, Kyoto, Japan

Objective: Patients with Parkinson's disease (PD) often show abnormal postures which appear to be related to the progression of PD on the one hand, and they seem to be related to anti-Parkinson medication, especially dopamine agonists on the other hand. The purpose of this study was to identify risk factors for axial dystonia in patients with PD in the light of clinical back grounds and drugs.
Methods:
a) Posture was evaluated according to the UPDRS-III item 28 in consecutive 165 patients with PD. To identify clinical features associated abnormal posture, a multiple regression model incorporating sex, age, disease duration, Hoehn & Yahr stage (H&Y), Mini-mental state examination and agonist and L-DOPA dosage was adapted.
b) In 10 patients abnormal posture was caused by dopamine agonists and relieved by ceasing or reduction of them. Assigning these 10 patients to cases and 50 patients who were matched in sex, age, H&Y and PD duration to the controls, L-DOPA and agonist doses were compared between the cases and the controls.
Results: 22 patients (13.3%) showed severe abnormal posture (item 28>3).
a) A multiple regression model revealed that higher H&Y ($R=0.44$, $p<0.01$) and longer disease duration ($R=0.18$, $p=0.026$) significantly increased the risk of abnormal posture.
b) Between the cases and the controls, no significant differences in dosages of agonists or L-DOPA were found.
Conclusion: Posture abnormality of PD patients was significantly related to the disease severity. There was no difference in agonist dosage between patients with agonist-induced abnormal posture and those without agonist-induced abnormal posture.

P2078

Brain MRI apparent diffusion coefficient (ADC) in Parkinson's disease and related disorders

A. Umemura[1,2], T. Oeda[1,2], M. Kousaka[2], S. Tomita[1,2], R. Hayashi[1,2], K. Yamamoto[1,2], H. Sawada[1,2]
[1]Clinical Research Center, [2]Neurology, Utano National Hospital, Kyoto, Japan

Purpose: To clarify the relationship MRI-ADC between pathological changes in Parkinson's disease (PD), dementia with Lewy bodies (DLB), multiple system atrophy (MSA) and progressive supranuclear palsy (PSP).
Methods: ADC in the region of interests (ROIs) which were set in the superior cerebellar peduncle decussation, middle cerebellar peduncle, and putamen were determined in 70 patients (PD (n=23), DLB (n=10), MSA-P (n=18), MSA-C (n=7) and PSP (n=12)).
Results: The ADC was elevated in the disease-specific ROIs (the putamen in MSA-P, the middle cerebellar peduncle in MSA-C, and in the superior cerebellar peduncle decussation in PSP) compared to PD. The ADC in these ROIs was positively correlated to the duration of the disease.
Discussion: ADC elevation may reflect reduction of limited diffusion of hydrogen which is possibly caused by neuronal loss and secondary gliosis.
Conclusion: Brain MRI ADC was elevated in the disease-specific ROIs.

P2079

Pedal oedema in Parkinson's disease patients using dopamine agonists

Ç. Türkmen[1], B. Özen[2], D. Ince Gunal[1]
[1]Marmara University Medical Faculty, Istanbul, [2]Karaelmas Universitesi Medical Faculty, Zonguldak, Turkey

Objective: Oedema in Parkinson's disease (PD) is an important problem that causes impairment in PD patients' quality of life and dopamine agonists (DA) are the commonly accused group of medicine for this complication. In this study we aimed to determine pedal oedema rate and risk factors in PD patients using DAs.
Method: 75 outpatients with the diagnoses of PD who receive levodopa and/or DA therapy were recruited to the study. 50 patients were using DAs including pramipexola, pribedile, cabergoline and ropinirole whereas 25 patients were using only levodopa regimen. The study evaluated age, sex, disease period, medication type, medication dose and duration and also comorbidities. Oedema examination was done in all PD patients.
Results: 64% of the patients in the DA group and 40% in the levodopa group had pedal oedema. Pedal oedema in DA group were significantly higher than in the levodopa group. No significant difference has been found among the DA subtypes (pramipexole, pribedile, cabergoline and ropinirole). Leg oedema did not cause discontinuation of treatment. No relationship between pedal oedema and age, sex, disease period, medication type, medication dose, medication duration and comorbidities has been determined in PD patients related with leg oedema.
Conclusion: Pedal oedema was a more common adverse event with DA compared to levodopa. But this complication was subtle and did not cause discontinuation of the treatment. Oedema with DA is thought as a class effect which was not related to drug dosage and interpreted as an idiosyncratic reaction.

P2080

Study of sociodemographic, environmental and dietary factors of Parkinson's disease: a study from Sri Lanka

R. De Silva[1], R. Gamage[2], D. Guruge[2], A. Keshavaraj[2], D. Sirisena[2], C. Wider[3]
[1]Genetic Diagnostic & Research Laboratory, Dept. of Anatomy, Faculty of Medical Sciences, University of Sri Jayewardenepura, Nugegoda, [2]National Hospital of Sri Lanka, Colombo, Sri Lanka, [3]Chef de Clinique, Lausanne, Switzerland

Background: Sri Lanka is an agricultural based country that has the highest suicide rate in South East Asia. The majority of suicides are related to toxic exposure to herbicides and pesticides, particularly paraquat which has been implicated in the pathogenesis of Parkinson's disease (PD), dietary habits and history of smoking have also been implicated as environmental factors.
Objective: To examine etiologic and risk factors in a Sri Lankan cohort of PD patients.
Methods: 108 patients (70 males and 38 female) diagnosed with PD at an urban medical clinic in Colombo were administered a structured interview focusing on sociodemographic characteristics, family history of PD, dietary habits, use of tobacco and alcohol and exposure to herbicides or pesticides.
Results: In 4 (3.7%) and 14 (13%) of cases the first symptoms of PD appeared under 40 yrs and between 40-50 years respectively. One (0.9%) male patient worked in the agricultural industry had been exposed to pesticides for 25 years, 10 (9%) had a family history of PD, 3 (2.7%) were born in consanguineous families, 11 (10%) were vegetarians, 56 (52%) and 3 (2.7%) were not coffee or tea drinkers, respectively, 3 (2.7%) males had never smoked, and 37 (34%) males used alcohol on a regular basis.
Conclusion: The finding that one PD case was exposed to pesticides as well as the extremely high proportion of smokers clearly warrant a large case-control study including medical clinics from urban and rural areas to ascertain the effect of these factors in the Sri Lankan population.

P2081

The role of carnosine administration in a transgenic mouse model of Huntington's disease

I. Plangár, D. Zádori, P. Klivényi, L. Vécsei
Department of Neurology, University of Szeged, Szeged, Hungary

The naturally-occurring dipeptide carnosine improves neurological outcome and has potential therapeutic benefit in Alzheimer's disease (AD), Parkinson's disease (PD) and cerebral ischemia. Huntington's disease (HD) is an autosomal dominantly inherited disorder caused by expansion of CAG repeat. The aim of this experiment was to determine whether carnosine exerts neuroprotective effect in a transgenic mouse model of HD. 14 N171-82Q transgenic HD mice received intraperitoneal injections of carnosine at a dose of 200mg/kg five days a week for 16 weeks, and 14 huntingtin positive mice received injections of vehicle, while 12 wild type mice also received carnosine and another 12 wild type mice received vehicle. The survival time was examined and Conducta system was used to observe spontaneous locomotor activity and explorative behaviour in an open-field test. The lifespan of treated and untreated mice was not improved significantly by carnosine treatment. The decrease in ambulation distance, the increase in immobility time and the alteration in the number of rearings caused by presence of the transgene was also not ameliorated by the treatment. We could not demonstrate any neuroprotective effect of carnosine in this model. The neuroprotective effect of carnosine in cerebral ischemia was dose dependent. The dose we used might not be sufficient to exert neuroprotection, or the basic pathomechanisms are different in these two models. In HD, the pathomechanism is slower and seemingly inhibition of oxidative stress is not sufficient to alter the phenotype. Protective effect can be achieved by using higher doses of carnosine or cocktails of different drugs.

P2082

Atypical parkinsonism in a patient with LRRK2 R1441c mutation

P. Solla, A. Cannas, G. Floris, L. Polizzi, E. Costantino, F. Marrosu, M.G. Marrosu
University of Cagliari, Cagliari, Italy

Background: Several recent articles in literature describe mutations in the leucine-rich repeat kinase 2 (LRRK2) gene and their relevance to Parkinson's disease (PD). The pleomorphic pathology of post-mortem LRRK2-positive patients suggests that LRRK2 mutations might also play a role in atypical parkinsonism. We describe a patient with atypical parkinsonism and detection of LRRK2 R1441C mutation.
Case report: A right-handed man was diagnosed as having parkinsonism at age of 61 years, after developing left arm stiffness and bradykinesia. The patient was initially treated with rasagiline 1mg daily. Subsequently, he experienced significant deterioration of motor functions, mainly severe bradykinesia and rigidity, with dystonic posture at the left arm, shuffling gait and imbalance with two falls and loss of facial expression with hypophonia. Additional treatment with ropinirole (16mg daily) and levodopa (400mg/d) was unsuccessful. Parkinsonism progressed rapidly and cognitive impairment with slow vertical saccades were also observed. [123I]FP-CIT SPECT (DatSCAN) revealed bilateral severe putaminal loss of uptake, more marked in the right putamen. Brain MRI did not show significant abnormalities.
Discussion: Although previous articles described that the clinical presentation of R1441C LRRK2 carriers was similar to sporadic PD and G2019S LRRK2 parkinsonism, our patient showed features of atypical parkinsonism resembling those described in tauopathies such as progressive supranuclear palsy (PSP). This observation suggests that LRRK2 R1441C mutation might, in some cases, underlie also atypical parkinsonism, although previous studies have failed to detect LRRK2 mutations in patients with PSP or other atypical parkinsonism.

P2083

Compulsive original artistic creativity in Parkinson's disease: a new dimension of the spectrum of reward-seeking behaviours

P. Solla, A. Cannas, E. Costantino, G. Floris, F. Marrosu, M.G. Marrosu
University of Cagliari, Cagliari, Italy

Background: In the last years, great attention has been focused on reward-seeking behaviours associated with dopaminergic replacement therapy in patients with Parkinson's disease (PD). We have identified a subset of PD patients with new-onset of reward-seeking behaviours characterized by the enhancement or emergence of compulsive original artistic creativity (COAC). Our goal is to report on this under-reported behavioural activity in PD patients and evaluate the correlation with dopaminergic therapy and the association with other reward-seeking behaviours.
Methods: 6 patients who developed, after PD diagnosis, enhancement of original pre-existing artistic talent as well as the emergence of a new original artistic tendency accompanied by an intense fascination related to the ongoing activities were identified and clinically assessed. Presence of impulse control disorders, repetitive behaviours, dopamine dysregulation syndrome, neuropsychiatric and cognitive symptoms were carefully investigated.
Results: All patients were taking dopaminergic drugs. Mean age of COAC onset±standard deviation was of 56.8±11.3 years. Only one of the patients has been previously engaged in a creative and artistic profession before PD onset. The analysis of the COAC in these patients has documented production of sculptures, paintings, songs, poems, tapestry, photographs. Two patients developed concomitantly a dopamine dysregulation syndrome and impulse control disorders such as hypersexuality, whilst a single patient presented punding. All the patients showed presence of dyskinesias.
Conclusions: The concomitant observation of other reward-seeking behaviours in PD patients with COAC and the crucial role played by dopaminergic therapy clearly suggests a continuum in the spectrum of these behaviours.

P2084

Motor fluctuations in post-traumatic hemiparkinsonism

P. Pita Lobo, M. Coelho, T. Mestre, M.M. Rosa, J.J. Ferreira
Hospital de Santa Maria, Centro Hospitalar Lisboa Norte, EPE, Lisbon, Portugal

Introduction: Motor fluctuations in Parkinson's disease have been extensively studied however, controversy still exists concerning the relative contribution of the neurodegenerative process and levodopa exposition. Post-traumatic parkinsonism is a rare condition that is usually static and can respond to antiparkinsonian treatment. We report a patient with post-traumatic hemiparkinsonism that developed motor fluctuations after levodopa treatment.
Clinical case: A 74-year-old man with a history of head trauma after a car accident at age 37 that resulted in a coma for 20 days, noticed a left hand tremor and difficulty in moving his left limbs one month after recovering consciousness. He started levodopa 1 year later and after 10 years of treatment he began noticing a progressive shortening in the duration of the benefit of each levodopa dose (wearing-off phenomena). He never developed chorea or symptoms involving his right limbs. He is nowadays autonomous for activities of daily life, without impaired balance or cognitive deterioration. Neurological examination during on time disclosed left hemiparkinsonism with slight bradykinesia and rigidity of the left limbs, a mobile dystonia of the left foot, and proximal paresis of the left upper limb without tremor or chorea. His current medication is levodopa/carbidopa 750mg/day (6 times/day) and trihexyphenidyl 6mg/day. Brain CT scan showed an old hypodense lesion involving the right substantia nigra.
Conclusion: This case suggests that chronic exposure to levodopa in the presence of a non-progressive pre-synaptic lesion involving the substantia nigra, in opposition to neurodegeneration, is sufficient to develop motor fluctuations but not enough to cause dyskinesias.

P2085

Mirtazapine in the treatment of depression and tremor in essential tremor patients

S. Telarovic[1,2]
[1]*Department of Neurology, University Hospital Center,*
[2]*School of Medicine, University of Zagreb, Zagreb, Croatia*

Objective: The purpose of the study was to determine the incidence of depression in essential tremor (ET) patients and the effect of mirtazapine in the treatment of depression and tremor.
Background: ET is one of the most prevalent movement disorders worldwide with a high incidence of anxiety and depression due to tremor in ET patients.
Patients and methods: 68 ET patients (by the Consensus Statement of the Movement Disorders Society, 1998) were included into the study. Both the examiner and the patients completed a detailed questionnaire – Tremor Assessment Form (severity of tremor, ADL interference by tremor, Archimedes spiral, etc.) with special emphasis on depression and anxiety due to tremor. Patients with the symptoms of depression were asked to complete the Beck Depression Inventory (BDI). The patients with moderate and severe depression (BDI≥20) had taken mirtazapine and were retested after 60 days.
Results: The mean age of the patients (F=37, M=31) was 51.2±1.4 yrs, while the mean duration of ET was 6.4±3.2 yrs. 31 patients had positive family history of tremor, 43 patients had symptoms of depression, but 28 of them had moderate and severe depression, thus requiring antidepressants. After 60 days of mirtazapine therapy, the majority of patients ($p<0.05$) showed decreased BDI and diminished severity of tremor (tremor score).
Conclusion: Many ET patients have different degree symptoms of anxiety and depression due to tremor. Mirtazapine reduced depression and the severity of tremor in the majority of depressive ET patients.

P2086

The value of NO-system and dopamine in the pathogenesis of Parkinson's disease

R.J. Matmuradov, R.J. Matmuradov, Kh. Khalimova, M. Raimova
Tashkent Medical Academy, Tashkent, Uzbekistan

In recent years, among the possible pathogenetic factors in the development of neurodegenerative diseases the metabolic nitrogen oxide is considered.
Aim: To evaluate the functional activity of NO-system and parameters of its relationship to the level of dopamine in patients with various forms of Parkinson's disease (PD).
Methods: The study involved 57 patients, average age 61.8±5.71 years. At the same time in the daily urine there was determined the level of dopamine by Matlina.
Results: In the akinetic-rigid form of PD the NO level was higher by 16.0% than the reference data, in shaking and mixed form of PD – by 43.4 and 216.9%. Increased levels of NO associated with significant depression in the groups studied of eNOS – by 28.6, 40.4 and 61.3%, respectively, the activation of NADPH-NR – by 31.4, 37.2 and 75.5% and the hyperexpression of ONOO level – by 112.5, 187.5 and 337.5%, respectively, compared with the control. At the same time there was found decrease in daily urine of patients with PD of catecholamine – dopamine, which was below the reference data in patients with akinetic-rigid form – by 15.8%, in shaking and mixed form of PD – by 20.0 and 31.8%.
Conclusion: The revealed dependence of the growth of clinical symptoms in patients with various forms of PD on an imbalance in the NO-system of red blood cells and decrease in daily urine dopamine justifies their importance in the pathogenesis of PD.

P2087

Polymorphism LRRK2 of Parkinson's disease in a Uzbek population

R.J. Matmurodov, K.M. Khalimova, M.M. Raimova
Tashkent Medical Academy, Tashkent, Uzbekistan

Most times Parkinson's disease (PD) is a multifactorial disease. However, in 10% of the cases described in monogenic forms of the disease. The last of the number of genes of monogenic forms of Parkinson's disease was identified LRRK2 gene, which encodes a protein dardarin. At the same time it revealed missense mutation G2019S. It is found in patients from different ethnic groups.
Objective: To study the role of the LRRK2 gene polymorphism in the development of Parkinson's disease, as well as holding geno-phenotypic comparisons with those of Uzbek nationality.
Methods: G2019S mutations were screened in 105 PD patients and 100 control Uzbek individuals.
Results: The average age of manifestation of first symptoms BP was 56.4±10.6 years. The examination of patients with BP were identified cases of heterozygous carriers of mutation G2019S in the gene LRRK2. Total 10 cases were identified G2019S mutation in the gene LRRK2. Thus, the total frequency of this mutation was 9.5% in the total group of examined patients with BP, 0.9% among patients with the sporadic form of BP and 7.1% among the autosomal dominant cases. None of the individuals of the control group had mutation G2019S in the LRRK2 gene. All patients with LRRK2-G2019S mutation developed typical levodopa-sensitive asymmetric parkinsonism with the start of symptoms. In all the patients the marked and early symptom was tremor.
Conclusion: Mutations in the gene LRRK2 may be regarded as a genetic factor in the development of Parkinson's disease in Uzbek individuals.

P2088

Effects of ropinirole prolonged release on sleep duration in patients with advanced Parkinson's disease (PD) with significant nocturnal symptoms

P. Martinez-Martin[1], H. Reichmann[2], J. Cooper[3], K. Rolfe[4], A. Lipschitz[5]
[1]Area of Applied Epidemiology, National Centre for Epidemiology and CIBERNED, Carlos III Institute of Health, Madrid, Spain, [2]Department of Neurology, University of Dresden, Dresden, Germany, [3]GlaxoSmithKline, Brentford, [4]GlaxoSmithKline, Uxbridge, UK, [5]GlaxoSmithKline, King of Prussia, PA, USA

Objective: To explore the effects of ropinirole prolonged release on sleep duration in patients with advanced Parkinson's disease (PD) and significant nocturnal symptoms.
Methods: Patients were randomized to adjunctive ropinirole prolonged release (2-24mg/day) or placebo for 24 weeks (study 101468/169). Diary cards recorded whether patients were awake/asleep, and, if awake, whether "on"/"off" for each 0.5-hour period during two 24-hour intervals before each visit. Post-hoc analyses assessed sleep duration during different periods (night-time [10pm-8am], daytime [8am-10pm], morning [8am-1pm], afternoon [1pm-6pm], evening [6pm-10pm]). A subgroup of patients with significant nocturnal symptoms at baseline (PD Sleep Scale [PDSS] total score ≤100) was analysed.
Results: For patients with baseline PDSS≤100, sleep duration during the night increased from baseline with ropinirole prolonged release versus placebo at week 24 last observation carried forward (LOCF), but this difference was not significant (adjusted mean treatment difference [AMTD]: 0.32, p=0.1110). Changes in daytime sleep duration were similar between groups at week 24 LOCF (AMTD: -0.00, p=0.9751) and for all periods of the day (AMTDs: morning, -0.06, p=0.8460; afternoon, 0.06, p=0.4294; evening, -0.03, p=0.5363).
Conclusions: Patients receiving ropinirole prolonged release had a non-significant increase in night-time sleep duration of almost 20 minutes relative to placebo, with no evidence of increased daytime sleep duration. These results support previous findings from a study with a broad population of patients with advanced PD who were not selected for significant baseline nocturnal disturbance.
Study sponsored by: GlaxoSmithKline R&D and SkyePharma.

P2089

New treatment strategy with botulinum toxin of cervical dystonia

A. Stenner, G. Reichel
Movement Disorders, Paracelsus Clinic, Zwickau, Germany

Background: Cervical dystonia is the most common form of focal dystonia. Most cases of cervical dystonia are idiopathic and generally it is a life-long disorder. In recent years, Botulinum toxin type A (BtA) has become the first line therapy. However, some patients are resistant to it.
Patients and methods: 78 patients with diagnosed primary cervical dystonia were examined. All underwent CT of the soft tissues of the neck. The cervical spine and the soft tissues of the neck were examined using magnetic resonance tomography. For comparison the MRI image data of 50 patients who had no cervical dystonia was analysed.
Results: It was shown that in lateral flexion and in rotation, in 1/5 patients the disorder affected only muscles which work on atlanto-occipital joints, and in a further 1/5 it affected only muscles which work on the cervical spine. 3/5 showed both disorders, but with a different degree of caput and collis involvement. Thus a ration of 1:1:3 was obtained in relation to this.
Conclusions:
1. Differentiation between laterocollis and laterocaput is clinically possible.
2. In rotation, clinical differentiation between torticollis and torticaput is not always possible. In this case CT sections at levels C3 and C7 are recommended.
3. Anteflexion – differentiation between anterocollis and anterocaput – and retroflexion – differentiation between retrocollis and retrocaput – are analysed by lateral inspection of the angle between the cervical spine and the thoracic spine or between the cervical spine and the base of the skull.

P2090

Diagnostic agreement is not satisfactory in psychogenic movement disorders

F. Morgante[1], M. Edwards[2], A. Espay[3], P. Mir[4], D. Martino[5], on behalf of the Italian Psychogenic Movement Disorders Study Group
[1]*Department of Neuroscience, Università di Messina, Italy,* [2]*Institute of Neurology, Queen Square, London, UK,* [3]*University of Cincinnati, Cincinnati, OH, USA,* [4]*Hospital Universitario Virgen del Rocío, Sevilla, Spain,* [5]*Università di Bari, Italy*

Background: Despite improved imaging and neurophysiological techniques, the diagnosis of psychogenic movement disorders (PMD) is still challenging.
Objective: To measure the inter-observer agreement among specialists in movement disorders (MDS) and general neurologists on the clinical diagnosis and on the clinical certainty judgment of PMD, relying on the phenomenology of MDS, Fahn/Williams (FW) and Shill/Gerber (SG) SG criteria.
Methods: 29 patients (15 with PMD, 14 with organic MDS) were enrolled consecutively and underwent standardized clinical interview and videotaped clinical examination, separately rated by 12 experts in MDS and 5 general neurologists, all unaware of the diagnosis. Diagnosis was given according to a binary judgment (psychogenic or organic) and according to the FW and the SG criteria.
Results: For binary judgment based just on video examination, the agreement was fair in both groups of raters and was improved by adding data of clinical history. For the FW criteria, agreement was moderate for both groups of raters (non experts weighted κ=0.55; experts weighted κ=0.59) whereas for the SG criteria agreement was fair for the non experts (weighted κ=0.39) and moderate for the experts (weighted κ=0.46).
Conclusions: Our data show a low level of agreement for both experts and non experts in MDS when judgment of PMD is based only on phenomenology. Moreover, diagnostic agreement according to clinical available criteria for PMD is not satisfactory. Diagnostic criteria with higher level of agreement among neurologists are needed to be developed in order to avoid misdiagnoses in PMD.

P2091

Increasing alertness in neuroleptic malignant syndrome (NMS)

C. Mihailescu[1], G. Mihailescu[2]
[1]*Internal Medicine, Psychiatry Clinical Hospital "Prof. Dr. Alexandru Obregia",* [2]*Neurology Department, Colentina Hospital, UMF Carol Davila, Bucharest, Romania*

Objective: NMS represents a rare, life-threatening condition occurring mainly in patients under treatment with neuroleptics, including lower-risk atypical neuroleptics. The manifestations are heterogeneous, including severe complications that account for its poor prognosis. Assessing the serum level of the creatinekinase (CK) is of central importance, increasing significantly even before all classical clinical manifestations set in. Since little is known about risk factors and susceptibility for NMS, early diagnosis and treatment could prove most useful. We aimed to prospectively evaluate the efficacy of an increased level of alertness regarding diagnosis and early treatment of the neuroleptic malignant syndrome (NMS).
Methods: We present 3 cases of NMS initially suspected based mainly on a typical significant and progressive increase of the CK levels, otherwise not accounted for, together with the progressive occurrence of the clinical features of NMS but only of mild severity and before any complication.
Results: The changes occurred in the psychiatric condition of the patients together with signs and symptoms paralleling the increasing levels of CK triggered specific treatment. Confirming the initial suspicion, the introduction of the specific treatment produced the reversal of the clinical and laboratory features in all 3 patients. Each case is discussed with regard to presentation, treatment and evolution of the clinical and laboratory parameters.
Conclusion: NMS signs and symptoms can develop insidiously and, if not treated early, can lead to life-threatening complications. Increasing the level of clinical and laboratory alertness can ensure an earlier diagnosis and treatment thus improving the prognosis in NMS patients.

P2092

An epidemiology of movement disorders in Yaroslavl district by materials of our register

A.U. Kovalchuk[1], M.A. Bykanova[2], N.V. Pizova[2], I.P. Kuznetcova[2]
[1]Department of Neurology, Neurosurgery and Child Neurology, [2]Yaroslavl State Medical Academy, Yaroslavl, Russia

Objective: To evaluate an epidemiology of movement disorders in Yaroslavl district.
Materials and methods: 1000 patients, who attended the movement disorders outpatient room during a 3-year period (2007-2010). Assessment included a personal interview, an interview of family members, a neurological examination, characterization of demographics, disease duration, UPDRS, the Hoehn and Yahr Scale, MMSE, FAB, use of anti-parkinsonian medications.
Results: Among 1000 patients with movement disorders 53% were from Yaroslavl, 37% were from Yaroslavl district. 474 patients (47.4%) patients had Parkinson's disease, 62 (6.2%) patients – Vascular parkinsonism, 17 (1.7%) patients had Parkinson-plus syndromes, 8 (0.8%) patients – iatrogenic parkinsonism, 1 (0.1%) patient – after encephalitis parkinsonism, 1 (0.1%) patient – cerebral growth parkinsonism, 415 (41.5%) – essential tremor, 7 (0.7%) patients – cervical dystonia, 8 (0.8%) patients – cranial dystonia, 5 (0.5%) patients – drug dystonia,1 patient (0.1%) – tics. 1 man with Huntington's chorea accordingly.
Conclusions: A prevalence of PD is 67.7 on 100,000 of population. Essential tremor – 59, Parkinson-plus syndrome – 2.4, vascular parkinsonism – 8.8, dystonia – 2.4 accordingly. These results are lower than in Europe; that shows bad diagnostic in out-patients departments. Working in the movement disorders room improved diagnostic, treatment, personal quality of life.

P2093

Liver toxicity possibly related with ropinirole use

F. Navacerrada[1], M.R. González-Alonso[2], H. Alonso-Navarro[3], B. Pilo-de-la-Fuente[1], P.-N. José Francisco[1], F.J. Jiménez-Jiménez[1]
[1]Neurology, [2]Gastroenterology and Hepathology, Hospital del Sureste, Arganda del Rey, [3]Neurology, Hospital La Mancha-Centro, Alcázar de San Juan, Spain

Objective: To report a patient who developed acute liver toxicity related to ropinirole as a therapy for restless legs syndrome.
Case report: A 68-year-old woman with previous history of hypothyroidism in treatment with thyroid hormones was evaluated because of a typical idiopathic familial restless legs syndrome which had begun 5 years before. She started a treatment with ropinirole 0.25mg three times per day. Three months later she was admitted to the Emergency Service because of marked asthenia, nausea, jaundice, acholic stools and choluria. She did not report fever, abdominal pain or diarrhoea. Blood cell count and routine coagulation values were normal. Biochemistry showed SGPT 2399 U/l, SGOT 1242 U/l, total bilirubin 11.1mg/dl (conjugated fraction 7.6mg/dl), alkaline phosphatase 2020 U/l, LDH 516 U/l, and ferritin 4,131ng/ml. Serological studies for hepatitis A, B and C viruses, cytomegalovirus and Epstein-Barr virus were negative. Antinuclear, antimitochondrial, anti-smooth muscle and anti-liver kidney (LKM) antibodies were also negative. Abdominal ultrasound and CT scan showed no abnormalities. Withdrawal of ropinirole led to disappearance of the clinical symptoms and normalization of all biochemical parameters within 2 months. Restless legs syndrome was successfully treated with gabapentine 800mg at night.
Conclusions: Our patient developed a cholestatic injury associated with hepatic cytolisis which was related to ropinirole use for restless legs syndrome. The exclusion of other possible causes of hepatitis and the temporal relationship with the use of ropinirole suggests that liver toxicity was possibly induced by this drug.

P2094

The clinical spectrum of wearing off in non-motor symptoms of Parkinson's disease: a Japanese multicenter study – Keio PD database

M. Seki[1], N. Suzuki[1], K. Takahashi[1], Y. Nihei[1], K. Ohta[2], J. Gotoh[3], K. Yamaguchi[4], Keio PD Database
[1]Department of Neurology, Keio University School of Medicine, [2]Department of Neurology, Tachikawa Hospital, [3]Department of Neurology, Tokyo Saiseikai Central Hospital, Tokyo, [4]Department of Neurology, Japanese Red Cross Mito Hospital, Mito, Japan

Objective: This study aimed to investigate the frequency and clinical spectrum of non-motor fluctuation (NMF) in Parkinson's disease (PD).
Methods: We evaluated 610 PD patients at 13 participating hospitals. We examined their clinical details by collecting clinical individual survey sheets for PD. Our investigation employed the wearing-off questionnaire of 19 symptoms (Stacy M, 2007), which was designed to identify motor fluctuation (MF) and NMF. We compared the patients manifesting both MF and NMF to those manifesting only MF. We classified NMF into psychiatric, autonomic, and sensory categories to evaluate the NMF spectrum.
Results: The total number of participating patients was 464. Their average age was 70.8±8.4 years (mean±SD), and disease duration was 6.6±5.0 years. 370 patients had non-motor symptoms (79.7%). 322 patients showed MF (69.4%) and 184 patients presented with NMF (39.7%). Compared to patients with only MF, patients with both MF and NMF had more severe motor symptoms, higher levodopa daily dose, higher frequencies of depression, and higher scores of Epworth Sleepiness Scale ($p<0.05$). The symptoms in psychiatric and sensory categories showed significantly higher fluctuation rates (48.6% and 45.1%, respectively) compared to the symptoms in the autonomic category (32.3%, $p<0.01$). 48.4% of the patients with NMF exhibited several categories of NMF.
Conclusion: In this study, 39.7% of patients presented with NMF. About half of the patients with NMF had several categories of NMF. The symptoms in the autonomic category showed lower frequencies of levodopa-related fluctuation compared to those in psychiatric and sensory categories.

P2095

In vivo MR and PET brain imaging confirmed striatal involvement in Cra1/+ mice carrying a dynein mutantion

K. Róna-Vörös[1], H.-P. Müller[1], S. Bucher[2], D. Kind[2], T. Kaulisch[2], H.G. Niessen[2], J. Tillmanns[2], K. Braunstein[1], B. Schwalenstöcker[1], J. Kassubek[1], D. Stiller[2], A.C. Ludolph[1]
[1]Department of Neurology, University of Ulm, Ulm, [2]In-vivo Imaging, Department of Drug Discovery Support, Boehringer Ingelheim Pharma GmbH & Co. KG, Biberach, Germany

Introduction: Dyneins belong to motor proteins and mediate intracellular movement of vesicles and retrograde axonal transport. Cramping1 (Cra1/+) mice carry a point mutation in the dynein cytoplasmic heavy chain 1 gene causing disturbed dynein function with typical clinical phenotype: twisting of the body, hind limb clasping, and progressive loss of muscle tone. This phenotype is partially explained by neonatal sensory neuropathy.
Aim: Because of the clinical features, we tested the hypothesis that Cra1/+ mice have extrapyramidal involvement. We performed longitudinal in vivo magnetic resonance imaging (MRI) and positron emission tomography (PET) using the Dopamine D2/3 receptor ligand [18F]-Fallypride to investigate structural and functional alterations in the striatum.
Methods: Gender-matched Cra1/+ and wild-type animals were used. MRI was performed at 5 and 10 months of age (n=20), PET scanning at 10 months of age. MRI data were acquired on a Bruker Biospec 47/40 scanner at 4.7 Tesla. Data were analyzed by volumetry. PET imaging was performed using a Siemens Inveon PET/CT scanner and data analyzed using a simplified reference tissue model (SRTM).
Results: We found significant reduction of the striatal volume and an expansion of lateral ventricles in the Cra1/+ mice compared to controls at 5 and 10 months of age. Furthermore, a significantly reduced binding of [18F]-Fallypride was revealed, showing an affected striatal dopaminergic system.
Conclusion: Our results support a striatal involvement in mice carrying a dynein mutation. This finding highlights the link between motor proteins and striatal pathology.
Acknowledgements: K. Róna-Vörös holds an EFNS Scientific Fellowship.

P2096

Prevalence of tremor in Nizhny Novgorod (Russia)

N.N. Shyndryaeva[1,2], O.S. Levin[2], V.N. Grigoryeva[3]
[1]Hospital #7, Niznii Novgorod, [2]Russian Med. Academy Postgraduate Education, Moscow, [3]N.Novgorod Med.Academy, N.Novgorod, Russia

Introduction: Tremor is the most common type of movement disorder. However prevalence of tremor and its main nosological forms in different population remains poorly investigated.
The aim of the study was to estimate the prevalence of tremor and its main nosological forms with the method of continuous epidemiological investigation in the city of Nizhny Novgorod in Russia.
Method: At first stage adult population of the Nizhny Novgorod's district (33,580) was screened for tremor with a special questionnaire. At second stage the persons who answered positively on the questionnaire were examined by the neurologist specialised on movement disorders.
Result: Tremor was diagnosed in 887 (10.4%) persons (6.5% of the general population). Essential tremor (ET) was diagnosed in 152 (17.1%) cases (prevalence of ET in general population was 1.1%), drug-induced tremor was found in 117 (13.2%) cases, alcoholic encephalopathy – in 35 (3.9%) cases, hyperthyroidism – in 29 (3.3%), posttraumatic tremor – in 23 (2.4%) cases, Parkinson's disease – in 11 (1.2%) cases, multiple sclerosis – in 8 (0.9%), peripheral neuropathy – in 5 (0.6%), idiopathic dystonia – in 7 (0.8%), hepatolenticular degeneration – in 2 (0.2%) cases.
Conclusion: The prevalence rate of tremor in Nizhny Novgorod amounted to 6.5%, while the prevalence rate of the ET was 1.1% as results of a population-based study. These prevalence rates are similar to the data of other population-based studies in European countries.

P2097

A study on the prevalence and predictors of levodopa induced dyskinesias in Parkinson's disease

N. Mi[1], Z.H. Hasnur[2], W.Y.W. Nurnafisah[2], H.J. Tan[2], A.A. Raymond[2]
[1]Department of Medicine, UKM Medical Center, [2]Universiti Kebangsaan Malaysia Medical Center, Kuala Lumpur, Malaysia

Introduction: Chronic levodopa therapy in patients with Parkinson's disease (PD) leads to motor fluctuations and dyskinesias.
Objective: This study aimed to determine the prevalence and predictors of levodopa-induced dyskinesia (LID) effect on the quality of life
Methods: This was a cross-sectional study involving PD patients on levodopa therapy for at least 6 months. The UPDRS score and Hoehn &Yahr staging was used to assess the severity of PD. The PDQ-39 questionnaire was used to determine the QoL.
Results: 95 patients were recruited. The prevalence of LID was 44%. The ethnic distribution was as follows: Chinese (64.3%); Malays (31%); Indian and others (3.7%). Peak dose dyskinesias were present in 60%, diphasic dyskinesia in 26% and early morning dystonia in 14%. 81% of patients with dyskinesia had clinical motor fluctuations. Patients with dyskinesia had significantly lower age of onset ($p<0.0001$), longer duration of levodopa therapy ($p=0.0005$), longer duration of illness ($p=0.0005$), higher total levodopa dosage/day ($p=0.0005$) and higher UPDRS scores ($p=0.005$) compared to those without dyskinesia. The significant predictors of dyskinesia were duration of levodopa therapy, age of onset and levodopa dose. Patients with dyskinesia had lower total PDQ39 scores ($p=0.006$) and mobility ($p=0.015$), activities of daily living ($p=0.039$), emotional well being ($p=0.039$), communication ($p=0.035$) and bodily discomfort ($p=0.023$) subscores of PDQ39 compared to those without dyskinesia.
Conclusions: The prevalence of LID was 44%. The important predictors of LID were duration of levodopa therapy, levodopa dose and age of onset. The QoL of our patients was significantly affected by dyskinesia.

P2098

Biological feedback in the therapy of parkinsonian tremor

A.V. Boika
2nd Neurological, 5 City Clinic, Minsk, Belarus

Parkinson's Disease (PD) is one of the most frequent causes of tremor. It is generally accepted that generator of PD tremor may be under motor cortex control. Biofeedback (BFB) therapy may be a perspective method of non-drug therapy. Goal – to determine the efficacy of BFB therapy in PD tremor. 44 PD patients (1M:1,5F; mean age 63.0±SD 12 years, disease duration 9.2±SD 7.6 years) were divided into main (drug therapy and BFB therapy, n=22) and control (only drug therapy, n=22) groups comparable to the duration of the disorder. Audio and video biofeedback was provided by self-made device for changes in acceleration of tremor. Each session lasted from 5 till 20 minutes. Each patient got 10 sessions. Spielberger's test, mini-mental state examination, clinical rating for tremor (0–10 scale) were done twice: in the beginning and at the end of the research. The dynamics of the value of postural tremor of the main group was 5.6±SD2 points and 5.3±SD1.8 points ($p<0.05$). For the control group – 5.5±SD2.1 points and 5.4 5±SD2 points ($p>0.1$). There was a statistically proved decrease of anxiety in the main group: 38±SD11 points and 30±SD10 points ($p<0.05$). For control group – 36±SD7 points and 34±SD7 points ($p>0.1$). The dynamics of the cognitive status was not statistically proved ($p>0.1$).
Conclusion: BFB therapy improves efficacy of PD tremor in complex therapy and may be used for the reduction of tremor.

P2099

The relationship between olfactory function with the volume of olfactory bulbus, disease duration and UPDRS scores in patients with early stage of idiopathic Parkinson's disease

H.A. Hakyemez[1], B. Veyseller[2], F. Ozer[1], G. Ivgin Bayraktar[2], D. Gurbuz[3], S. Cetin[1], Y.S. Yıldırım[2]
[1]Neurology Department, [2]Otolaryngology – Neck Surgery Department, [3]Radiology Department, Haseki Training and Research Hospital, Istanbul, Turkey

Non-motor symptoms, such as cognitive, sleep, autonomic and sensory disturbances were shown in the studies about Idiopathic Parkinson's Disease (IPD) from the 1960s. Many non-motor symptoms appeared before motor symptoms have been reported. Olfactory dysfunctions claimed to be present in more than 80% of IPD patients. During pre-symptomatic period according to the braak stages 1-2, inclusion body pathology confined to the medulla oblongata/pontine tegmentum and olfactory bulb (OB) /anterior olfactory nucleus. This study was performed at the Department of Neurology, Otolaryngology – Head – Neck Surgery and Radiology in our hospital. 28 IPD who were according to the Hoehn-Yahr scale stage 1&2 and 19 healthy people as controls were evaluated. We used Unified Parkinson's disease rating scale (UPDRS), University of Pennsylvania Smell Identification Test (UPSIT) for each individual. We calculated OB volumes by using MRI. We found UPSIT scores were lower in the patient group and no relation between olfactory function with OB volume, disease duration and UPDRS in IPD. As a result, olfactory dysfunction in IPD is not depended on the olfactory epithelial damage, it depends on the pathology in central nervous system pathology. Due to one of the early symptoms of the diseases olfactory dysfunction, we can use UPSIT to search the population at risk for early diagnose. But OB volumes are not useful to diagnose pre-symptomatic patient because of the decrease by aging.

P2100

HDAC6 regulates autophagy pathway essential for α-synuclein clearance process

M. Su[1], J.-J. Shi[1], J. Chen[1], H.-F. Zheng[1], Y.-P. Yang[1,2], C.-F. Liu[1,2]
[1]Department of Neurology, Second Affiliated Hospital of Soochow University, [2]Institute of Neuroscience, Soochow University, Suzhou, China

Background and aims: Histone deacetylase-6 (HDAC6) has the capacity to bind and recruit misfolded protein cargo to dynein motors for transport to aggresomes, the MTOC (microtubule-organizing centre)-localized inclusion body where excess protein aggregates are deposited. Recent evidence suggests that HDAC6 is a novel component that controls the fusion of autophagosomes and lysosomes. In order to provide a new target for drug intervention of Parkinson's disease, we studied the role of HDAC6 in the autophagic degradation process of α-synuclein.
Methods: With MPP+ treatment, PC12 was detected by western blot to observe the change of HDAC6, α-synuclein and autophagic proteins LC3-II and P62. Furthermore, colocalization of HDAC6 or LC3 respectively with α-synuclein and lamp1 were also detected by immuno-fluorescence and colocalization technology.
Results: After treatment with MPP+ for 12h, HDAC6, LC3-II, P62 and α-synuclein expression in protein levels significantly increased compared with control group ($p<0.05$). Fluorescence signal of HDAC6, LC3, α-synuclein obviously enhanced compared with control group ($p<0.05$). HDAC6 and LC3 mainly aggregated at the periphery of nucleolus and colocalization with α-synuclein. The colocalization signals of lamp1 and HDAC6 were decreased ($p<0.05$), and lamp1 aggregated at the periphery compared with untreated cells.
Conclusions: MPP+-induced HDAC6 expression increased in PC12 cells, which will help the aggregated α-synuclein form aggresome around nuclear and recruit autophagic vesicles to the nuclear. But this stress process could not completely remove the aggregated α-synuclein and then raised autophagic stress.

P2101

Gait disorder: a new marker of frontotemporal dementia

G. Allali[1], B. Dubois[2], F. Assal[3], E. Lallart[4], L.C. de Souza[2], M. Bertoux[5], C. Annweiler[6], F.R. Herrmann[3], R. Levy[7], O. Beauchet[6]
[1]Neurology, Geneva University Hospitals and University of Geneva, Geneva, Switzerland, [2]Federation of Neurology, Salpêtrière Hospitals, Paris, France, [3]Geneva University Hospitals and University of Geneva, Geneva, Switzerland, [4]CNRS UMR 7593, [5]Salpêtrière Hospitals, [6]Angers University Hospital, [7]Neurology, Hopital Saint-Antoine, Paris, France

Background: Gait was considered as an automated motor activity independent of cognition, but recent studies underscored that gait and higher-level cognitive function seem to be closely related in demented subjects. Patients with frontotemporal dementia (DFT) present a neurobehavioural syndrome usually associated with a dysexecutive syndrome, but gait disorders was not described although strong relationship exists between the gait and prefrontal functions. We tested the hypothesis that FTD patients would present with more gait changes than older healthy controls and demented patients with Alzheimer's disease (AD).
Methods: 19 with FTD, 19 with AD and 22 healthy controls were included in the study. Mean values and coefficients of variation (CV) of stride time while only walking and while walking and backward counting from 50 to 1 (dual tasking) were measured using the SMTEC®-footswitch system.
Results: Mean value and CV of stride time, were significantly increased in both patient groups compared to healthy controls during single task and during dual tasking ($p<0.001$). After adjusting for age, Mini-Mental State Examination, psychoactive drugs, sex and previous fall, only the FTD patient group was associated with CV of stride time during single walking ($p<0.001$) and dual tasking ($p=0.005$).
Conclusions: Patients with FTD present gait instability in comparison with AD patients and healthy controls. This association can be related to the dysexecutive syndrome present in FTD patients. Gait during single and dual-tasking could represent a supportive argument for the diagnosis of FTD and we would advocate gait assessment in the work-up of dementia.

P2102

PANK2 mutation without the eye-of-the-tiger sign. Successful treatment of a dystonic storm with pallidal stimulation

F. Grandas[1], C. Fernandez-Carballal[1], J. Guzmán de Villoria[1], A. Contreras[1], J.M. Velazquez[1], I. Ampuero[2]
[1]Hospital General Universitario Gregorio Marañón, [2]Banco de Tejidos para Investigaciones Neurologicas, Madrid, Spain

Background: Pantothenate kinase-associated neurodegeneration is an autosomal recessive progressive neurological disorder, usually including severe generalized dystonia, linked to PANK2 gene mutations. It is associated with the eye-of-the-tiger sign on MRI. There is no effective pharmacological treatment for this disorder.
Objective: To report on a patient with PANK2 mutation without the eye-of-the-tiger sign and the therapeutic effect of pallidal deep brain stimulation.
Case report: An 18-year-old male, born from a consanguineous marriage, began to experience tremor in both hands at the age of 13. Two years later left foot dystonia appeared followed by athetoid movements of the left hand fingers. Dystonia generalized within 6 months with prominent extensor trunk spasms. The left foot adopted a permanent varus position and the patient was unable to walk. Neither cognitive nor visual impairment were reported. Bilateral globus pallidus hypointensity was found on T2-weighted MRI sequences without the central hyperintensity of the classical eye-of-the-tiger sign. Aceruloplasminemia, neuroferritinopathy and neuroaxonal dystrophy were ruled out. A homozygous 1021C-->T mutation (p. T237M) in exon 6 of the PANK2 gene was found. Treatment with clonacepan, baclofen, anticholinergics, tetrabenazine and botulinum toxin was ineffective. Dystonia worsened leading to a status dystonicus with continuous repetitive violent opisthotonic axial spasms which required the induction of barbiturate coma. Bilateral globus pallidus deep brain stimulation caused a rapid improvement of dystonia which persists four months after surgery.
Conclusions: PANK2 mutations are not always associated with the eye-of-the-tiger sign on MRI. Pallidal deep brain stimulation is an effective treatment of dystonic storm in these patients.

P2103

Function and quality-of-life of fluctuating PD patients on DBS, intraduodenal levodopa and per-oral medication

E.C. Egebakken[1], S. Vilming[2], M. Toft[3], C. Lundqvist[2,4]
[1]Neurology, Akershus University Hospital, Lørenskog, [2]Neurology, Oslo University Hospital, Ullevål, [3]Neurology, Oslo University Hospital, National Hospital, Oslo, [4]HØKH, Research Centre, Akershus University Hospital, Lørenskog, Norway

Objectives: To evaluate physical function and quality-of-life (QoL) in patients with advanced Parkinson's disease (PD) treated per-orally, with intraduodenal levodopa infusion (IDL) or deep-brain stimulation (DBS).
Materials and methods: This is a cross-sectional study. Disease-related function and QoL was measured by Short-Form 36 (SF36) and PD Questionnaire 39 (PDQ39) in 57 patients with fluctuating disease. Disease related function was by UPDRS and Hoehn and Yahr staging.
Results: Patients on DBS or IDL had better disease related function than per-orally treated patients. SF-36 showed a tendency towards better QoL scores in dimensions related to physical functioning for the same groups, which reached significance for DBS. PDQ-39 showed no significant differences. PD patients had worse SF-36 scores for social functioning and pain, better for vitality and role-physical than the general population. Per-oral patients were worse on mental health and pain, DBS worse on pain and better on role-emotional with IDL similar to the general population on these dimensions.
Conclusions: PD patients may benefit from IDL and DBS both in terms of function and QoL. Further prospective and randomised studies are needed.

P2104

Distal to proximal biomechanical changes of gait in Parkinson's disease in function of disease severity: a trunk-pelvis hypothesis of freezing

G. Albani, V. Cimolin, C. Trotti, M. Comi, M. Galli, A. Mauro
Neurosciences, Istituto Auxologico Italiano, IRCCS, Piancavallo, Italy

Gait disturbances are the most relevant of motor symptoms in terms of disability and morbidity in Parkinson's disease (PD). In order to set up the aims of a recovery program, it is crucial to identify the biomechanical features of gait correlated to each stage of the disease, so that it would be possible to focus the rehabilitative effort on the specific functional deficit. We studied 40 PD patients divided in GROUP A: patients without any clinical gait abnormalities; GROUP B: patients without freezing but with gait hypokinesia; GROUP C: patients with freezing. All the subjects performed 3D gait analysis with these findings: GROUP A: low peak of ankle plantarflexion moment during terminal stance; GROUP B: limited range of motion of hip joint; GROUP C: excessive hip and knee joint flexion during the whole gait cycle. Our findings indicate biomechanical changes of gait, according to a distal to proximal involvement of lower leg motility, in function of disease severity. Patients with freezing show a prevalent pelvic involvement suggesting a pathogenetic relationship with alteration of trunk-pelvis axis.

P2105

The impact of depression on sleep quality and excessive daytime sleepiness in Parkinson's disease patients

N. Klepac[1], T. Marina[2], D. Britvic[3], I. Lusic[2], S. Telarovic[1], L. Unusic[1]
[1]Neurology, Clinical University Hospital, Zagreb, [2]Neurology, [3]Psychiatry, Clinical University Hospital, Split, Croatia

Background: Sleep disorders occur commonly in PD, and may have a substantial impact on quality of life.
Aim of the study: To evaluate the sleep disorders in Parkinson's disease (PD) patients and their relationship with depression.
Patients and methods: A total of 195 outpatients, diagnosed as having idiopathic PD were evaluated by Pittsburgh sleep quality index (PSQI), Unified Parkinson's Disease Rating Scale (UPDRS), Hoehn &Yahr staging (H&Y), Epworth Sleepiness Scale (ESS) and Beck Depression Inventory (BDI). Patients were divided into two groups in terms of BDI score: depression and non-depression group. 172 patient who fulfilled the criteria for major depression matched for age, gender and disease duration were included as control group.
Results: Sleep quality on PSQI was significantly poorer in the group of depressed patients as compared to general PD patients. Depressed PD patients had poorer sleep quality than non-depressed ones but still better than patients with major depression. This was evident in several components of PSQI. In PD patients sleep quality correlated with duration of the disease, disease severity and depression excessive daytime somnolence was more pronounced in the group of PD patients as compared to patients with major depression. There was no correlation between sleep quality and excessive daytime somnolence, but strong correlation was found with disease severity and dopamine agonist.
Conclusions: Depression was the most important factor associated with the sleep disorder among patients with PD. As contrary to sleep disorders during night daytime somnolence was independent of depression and was intrinsic to PD patients.

P2106

An unusual presentation of Pantothenate kinase associated neurodegeneration (PANK) – a case report

D. Apetauerova[1], P. Houska[2]
[1]*Lahey Clinic, Burlington, MA, USA,* [2]*Strakonice Hospital, Strakonice, Czech Republic*

Mutations in the PANK2 gene account for the majority of neurodegeneration with brain iron accumulation (NBIA) cases and cause an autosomal recessive inborn error of coenzyme A metabolism called pantothenate kinase-associated neurodegeneration (PKAN). PKAN is characterized by dystonia and pigmentary retinopathy in children or speech and neuropsychiatric disorders in adults. In addition, a specific pattern on brain MRI, called the eye-of-the-tiger sign, is virtually pathognomonic for the disease. We describe an unusual case of this disorder presenting in adulthood with gait abnormality and action foot dystonia.
Case report: A 31-year-old man with normal past medical history developed left foot pain at age 16 after prolonged walking. Exam was notable for tachylalia, brisker lower extremity reflexes without upper motor neuron signs and inversion left foot dystonic posturing while ambulating for a prolonged period of time. One brother reportedly had abnormal gait. Brain MRI showed "eye of the tiger sign" and genetic analysis confirmed homozygous mutation of exon 5 of the PANK2 gene.
Summary: Panthotenate-kinase deficiency is a rare autosomal recessive hereditary condition characterized by early onset of progressive movement alteration that includes dystonia, rigidity and choreoathetosis usually associated with pyramidal signs and mental deterioration. Adult onset with atypical presentation is rare. We report a case of an adult onset form where diagnosis was missed until MRI showed classic imaging findings. The need for clinical recognition of this entity and differentiation of this form from other static and progressive neurological illnesses is emphasized.

P2107

Benefit of DaTSCAN (123I-ioflupane) SPECT in differential diagnosis of Parkinson's disease: an interim analysis

Z. Kosutzka[1], P. Valkovic[1], P. Povinec[2], J. Benetin[1]
[1]*II. Neurological Department, Comenius University,* [2]*Biont, Bratislava, Slovak Republic*

Introduction: Diagnosis of Parkinson's disease (PD) is not simple especially when talking about the early stages. The most common mistake concerning differential diagnosis is an essential tremor (ET) and a group of diseases called Parkinson-plus syndromes (PPS). The aim of our pilot study is to summarize the benefit of examination of presynaptic dopamine transporter using single-photon emission tomography (SPECT) with ligand DaTSCAN (123I-ioflupane) in differential diagnosis of PD.
Patients and methods: This analysis included the cohort of 41 consecutive patients from our Movement Disorder Outpatients' Department with clinically uncertain parkinsonian syndrome. Doubts were based on clinical examination, course of the disease or an unsatisfactory compliance of the patient. Subjects were visiting neurologist before SPECT examination because of tremor or parkinsonism in average time of 3.6±3.0 years with following "working" diagnoses: PD (n=28), ET (n=2), PPS (n=5), coincidence of PD and ET (n=5) and vascular parkinsonism (n=1). In 23 patients, SPECT showed result consistent with PD, whereas in 18 cases a normal image was found. In 38 (92.7%) patients out of 41 cases, DaTSCAN SPECT contributed to conclusive clinical diagnosis. In 3 cases (7.3%), in spite of the result of SPECT that was pointing to PD (bilateral asymmetric reduction of radiopharmacum in basal ganglia especially in putamen), a follow-up and therapeutical response resulted to PPS – namely progressive supranuclear palsy.
Conclusion: The results of this study indicate that examination using DaTSCAN SPECT has significant contribution in management and differential diagnosis of PD.

P2108

Pain and night time sleep disturbances assessed by bedside questionnaires in Parkinson's disease patients

M.-L. Muntean, N. Tohanean, L. Perju-Dumbrava
Neurology Clinic 1, University of Medicine and Pharmacy 'I. Hateganu', Cluj-Napoca, Romania

Introduction: Pain is a frequent non-motor symptom of patients with PD. Pain affects many of the dimensions of the quality of life (QL) and interacts with sleep. Night-time sleep problems have various causes. Many factors may coexist in the same patient. It is important to determine these factors in order to establish specific treatments and thus to improve sleep and QL.
The aim of this study is to analyze the painful symptoms and night-time sleep problems in patients with PD and to determine the relation between pains and sleep disturbances.
Patients and methods: We included in the study 60 patients with mild to moderate PD. Pain was measured on the visual analogue scale (VAS) and using the Brief Pain Inventory (BPI). Nocturnal sleep was assessed using the Parkinson's Disease Sleep Scale (PDSS) and the quality of life was analyzed using the PDQ-39. The relationship between pain and night-time sleep problems was examined.
Results: Pain was present in 38 (63.33%) patients with a median severity of 6.5 on the VAS. Night-time sleep was impaired in approximately two thirds of the PD patients. We observed a correlation between higher scores on VAS and lower scores on PDSS, especially in the items assessing nocturnal motor symptoms (items 10-12).
Conclusion: Pain and night-time sleep problems are frequent in PD patients. The presence of pain affects the quality of sleep and influences the quality of life. Using the bedside questionnaires, pain and sleep can be easily assessed in all patients.

P2109

Imaging and transcortical magnetic stimulation studies of a case with mirror movements

T. Kasikci, S. Bek, E. Tokgoz, G. Yozgatli, Y. Kutukcu, Z. Odabasi
Gulhane Medical Academy, Ankara, Turkey

Introduction: Mirror movements are defined as non-voluntary movements in contralateral homologous extremities during voluntary movements of one side. It is usually observed in the distal parts of upper extremities and it is not a pathological finding within the first decade.
Case report: We present a 21-year-old male with left sided hemiparesis and mirror movements in his hands. In brain magnetic resonance imaging polymicrogyria was observed in right parietal lobe. With transcortical motor stimulation of left motor cortex, motor response was recorded from ipsilateral and contralateral abductor pollicis brevis muscle.
Conclusion: Congenital malformations are mostly responsible for mirror movements. The vast majority of cerebral malformations, depending on the migration abnormalities and are generally classified into four groups: Agyri / pachygyri, heterotopia, cortical dysplasia and polymicrogyria. Polymicrogyria is a neuronal migration defect. It is defined as thickening of gray matter, loss of gyral pattern and flattened border of gray and white matter. Clinical findings of polymicrogyria vary according to its location and width of lesion. Coincidence of polymicrogyria and mirror movements is seen rarely. According to transcranial magnetic stimulation we suggest that polymicrogyria may lead to a decrease in transcallosal inhibition in the affected side and an increased activity of ipsilateral corticospinal pathways in the opposite hemisphere, causing mirror movements.

P2110

Cognitive differences between the earliest stages of cognitive impairment and dementia in Parkinson's disease

M. Petrova, M. Raycheva, Y. Zhelev, L. Traykov
Department of Neurology, Medical University in Sofia, Sofia, Bulgaria

Objective: To determine the specific differences in the cognitive profile between Parkinson's disease patients with mild cognitive impairment (PD-MCI) and very mild dementia (vmPDD) in order to find the earliest neuropsychological markers for the development of PDD.
Methods: We investigated 33 PD-MCI patients and 23 vmPDD patients (MDS criteria; MMSE≥24) and 31 normal elderly controls. All subjects underwent a comprehensive neuropsychological assessment.
Results: Compared to controls, the PD-MCI group showed significant deficits in immediate and delayed free recall of the Free and Cued Selective Reminding Test (FCSRT), as well as in some tests measuring different aspects of attention/executive functions, such as digit span forward and backward, TMT B and MCST and phonemic fluency. Besides the deficits in above-mentioned tests, the vmPDD patients also demonstrated impairment on semantic fluency, Boston naming test, TMT A, Stroop test, and copy tests. However, there was not a significant difference between both PD groups in recognition and number of intrusions of the FCSRT.
Conclusions: Widespread deficits in attention/executive function and retrieval of the episodic memory are prominent features in the cognitive profile of PD-MCI patients, while deficits in psychomotor speed, language and visuospatial/constructional abilities are observed only in patients with vmPDD. The coding of episodic memory is still preserved in this early stage of dementia.

P2111

Knowledge of medical professionals in Thailand on antiparkinsonian drugs and usage

R.S. Tabucanon[1], R. Bhidayasiri[2]
[1]*Chulalongkorn Comprehensive Movement Disorders Center,* [2]*Neurology, Chulalongkorn Comprehensive Movement Disorders Center, Bangkok, Thailand*

Background: There are various antiparkinsonian medications with different mechanisms of action. Physicians who care for Parkinson's disease (PD) patients may not be aware of the various modes of therapy in different stages of PD.
Objective: To explore the level of knowledge of medical professionals in Thailand on antiparkinsonian drugs and usage.
Method: A set of questionnaires was distributed to medical professionals throughout the country between January and December 2009. The questionnaire consisted of three sections on general knowledge of antiparkinsonian medications, therapeutic indications based on recent guidelines developed by EFNS, AAN and MDS, and adverse events of medications.
Results: 470 medical professionals completed and returned the questionnaire. Of the total respondents, 40 (8.5%) were medical students (MS), 121 (26%) were general practitioners (GP), 198 (41%) were internal medicine residents (IMR), 33 (7%) were neurology residents (NR), 53 (11%) were board-certified internists (IM), and 31 (6.5%) were board-certified neurologists (N). Most respondents specialized selected levodopa as the initial choice of therapy for early PD(MS:85; GP:66; IMR: 71; IM: 47). In contrast, dopamine agonists are preferred by NR and N (81%, 80%). In advanced PD, all respondents preferred levodopa as the first choice of therapy. More information on therapeutic decisions in different clinical situation will be presented at the meeting.
Conclusion: Variety of opinions on the treatment of PD was collected from respondents with different training backgrounds. This information necessitates more educational programs and training for medical professionals in Thailand.

P2112

Prospective evaluation of the frequency and treatment of restless legs syndrome (RLS) at a palliative care unit

M. Hensler[1,2], J. Remi[1], S. Lorenzl[1,2]
[1]*Neurology,* [2]*Interdisziplinäres Zentrum für Palliativmedizin, LMU München, Munich, Germany*

Introduction: Common medical problems are often associated with sleep disturbances. Patients with chronic medical disorders often have shorter and less restorative sleep. This poor sleep may worsen the patient's subjective symptoms. Complaints are often due to insomnia, insufficient sleep or restless legs syndrome (RLS). The frequency of RLS in patients suffering from malignant diseases reaches from 20-46%. Since there are no data published related to the frequency of RLS in patients in end stage of malignant diseases, we aimed to document the frequency and treatment options of RLS at a palliative care unit.
Methods: Since January 2010 we have prospectively examined patients in our palliative care unit after the RLS diagnostic criteria of the consensus conference of the National Institute of Health.
Results: Until now (March 2010) we have examined 59 patients (30 men, 29 women) in our palliative care unit. 76.3% (45) with malignant and 23.7% (14) with non-malignant diseases. Only 2 (3.4%) of this patients fulfilled the diagnostic criteria for RLS. Both patients have been treated with transdermal rotigotine. Symptoms were effectively controlled after one day in both patients. However, the second patient needed additional palliative sedation since symptoms of general stress were evolving.
Conclusion: RLS might not be a common cause of sleep disturbances in patients at a palliative care unit. However, patients who fulfil diagnostic criteria are treated effectively with rotigotine. The reason for the low frequency of RLS might be treatment with opioids in a significant number of patients in advanced stages of their diseases.

P2113

Late onset severe progressive Mohr-Tranebjaerg syndrome in two female relatives

J. Klempir[1], O. Klempirova[1], J. Hadac[2], J. Roth[1]
[1]Dept of Neurology, Charles University, [2]Dept of Neurology, Thomayer Hospital, Prague, Czech Republic

The Mohr-Tranebjaerg syndrome (MTS) is a rare neurodegenerative X-linked recessive disorder due to mutations in the deafness-dystonia peptide-1gene. MTS is characterized by early onset progressive sensorineural deafness, dystonia, spasticity, ataxia, neuropathy, cognitive impairment, behavioural abnormalities, cortical blindness, agamaglobulinemia and fractures.

Previous studies report some carrier females showed signs of minor neuropathy and mild hearing impairment. We present late onset severe progressive MTS in two females (mother and daughter).

Case1: A 61-year-old woman with negative family history started to develop cervical dystonia at the age of 35. At the age of 44, the patient developed spastic dysphonia and one year later dystonia of the right hand. Currently she suffers from auditory and visual impairment, severe dysartria and dysphagia with loss of weight, generalized choreodystonia and postural instability. Neuropsychological assessment showed progressive subcortical dementia with prominent features of deficit in attention, executive functions, visuospatial functions and memory. In addition she has symptoms of anxiety, irritability and depression.

Case 2: Her 37-year-old daughter developed cervical dystonia at the age of 27, followed by hyperkinetic dysartria at the age of 35. In neuropsychological assessment we found mild deficit in verbal working memory, attentional fluctuation and moderate depression with irritability. In the son of case 2, agammaglobulinemia was diagnosed at the age of 8 months. He was delayed in speech development for sensorineural deafness, at the age of 4 years he developed dystonia and spasticity and died at the age of 6 years due to status dystonicus.

P2114

Quality of sleep in Parkinson's disease and other parkinsonian syndromes

Z. Garašević, D. Georgiev, S. Frol, I. Rigler, M. Trošt, Z.Pirtošek
Department of Neurology, University of Ljubljana, Slovenia

Introduction: Non-motor symptoms are often neglected and left untreated in Parkinson's disease (PD) patients. The aim of our study was to assess and compare quality of sleep and other non-motor symptoms (mood, anxiety) as well as quality of life in patients with PD and other parkinsonian syndromes (PS).

Patients & methods: 12 consecutive patients with PD (age 60±9.6 y, disease duration 9.9±5.5 y, 4 women; H&Y 2.75±0.9, UPDRS 39.9±11.2, MMSE 28.1±1.7) and 10 patients with PS (2 PSP, 8 MSA, age 64.1±9.4 y; disease duration 6.1±2.6 y; 3 women; H&Y 3.2±0.6, UPDRS 46.3±8.6, MMSE 27.7±1.8 were asked to fulfil four questionnaires on admission: Parkinson's Disease Sleeping Scale (PDSS), Beck Depression Inventory (DBI), Beck Anxiety Scale (BAS) and PD quality of life questionnaire (PDQ-39). Results were compared using 'Difference between means' test for small samples.

Results: PDSS score was significantly lower (worse) in PD compared to PS (87.3±26.8 vs. 98.5±25, $p<0.05$), although UPDRS and H&Y scores were higher in PS ($p=0.078$ and $p=0.094$). There was no difference between PD and PS in BDI (14.4±8.2 and 14.8±6.4), BAS (21.7±14.5 and 27.1±10.1) and in PDQ-39 scores (65.8±20.7 and 69.8±21.1).

Conclusion: PD patients experienced significantly worse sleep quality although their UPDRS score was lower. All other measures did not show statistically significant difference. These findings indicate a possible differentiation between parkinsonian syndromes regarding sleep quality.

P2115

Risk for psychosis in Parkinson's disease – part I: Drugs and psychosis

H. Sawada[1,2], T. Oeda[1,2], A. Umemura[1,2], S. Tomita[1,2], R. Hayashi[1,2], M. Kousaka[1,2], K. Yamamoto[1,2]
[1]Clinical Research Center, [2]Neurology, Utano National Hospital, Kyoto, Japan

Object: To clarify the relationship between dosage of anti-Parkinson drugs and the risk of psychosis in Parkinson's disease.

Method: A case-crossover study. Participants: 325 patients with Parkinson's disease between May 2004 and November 2007 were analyzed. Psychosis which requires prescription of anti-psychotic drugs was the endpoint. Main outcome measure: Prescription 1 month before psychosis was compared to those 3, 6, 12, and 18 months before psychosis. Dopaminergic drugs (L-Dopa + dopamine agonist (LDED)), use of anti-cholinergic drugs, and use of donepezil were analyzed using a conditional logistic model.

Result: Among the 325 participants 57 patients developed psychosis. In patients with H-Y I to III, dopaminergic drug dosage was significantly related to the risk (OR 2.5 /100mg LDED (95% CI 1.4-4.7), $p<0.003$). In contrast, no drugs were identified as significant risk for psychosis in patients with H-Y IV-V. Similarly it was related to the risk in patients with duration of 10 years or less (OR 2.9 (1.3-6.5), $p<0.009$).

Conclusion: Risk for psychosis was elevated by dopaminergic replacement therapy especially in patients with mild severity or shorter duration rather than in patients in advanced stages.

P2116

Assessment of autonomic dysfunction in Parkinson's disease patients by electrocardiogram (EKG)

A. Sanlı Turk, A. Koksal, F. Karademir, A. Dırıcan, S. Baybas
Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases, 2.Neurology Department, Istanbul, Turkey

Autonomic involvement may be seen depending on side effects of treatment or neuron degeneration in Parkinson's disease. Sudden death caused by autonomic dysfunction detected by QT interval has been reported in studies. The aim of this study is to evaluate the degree of OT interval prolongation, and its relationship between gender, duration of disease, and treatment. The patients were not using any drugs effecting QT interval prolongation. In EKG analyses, QT-c intervals were calculated according to Bazett's formula. 12 of 20 patients were female and 8 patients were male. There were 6 female and 12 male patients in the control group. The mean age of patients was 69.8 (±8.57), control group's was 64.8 (±8.71). The mean duration of disease was 6.1 (±3.1) years. QT, QT-c and RR intervals were not significantly correlated with duration of disease ($p>0.05$). Both groups were compared according to gender and there was not significant correlation between gender and those intervals ($x^2=2.70$, $p=0.10$). QT-c intervals were assessed and found significantly longer in patients (473.75) than in controls (404.16) ($p<0.001$). The patients were using L-Dopa, Dopa agonists, MAO-B inhibitory drugs in similar doses and combinations, and the effects of the drugs on QT intervals could not be compared. We believe that QT-c measurement is an important parameter in terms of determining the risk of sudden death in Parkinson patients whose autonomic symptoms are prominent. For this reason, we think that if there is an OT-c interval prolongation, these Parkinson patients must be followed by cardiology, too.

P2117

Frontal dysfunction in Parkinson's disease patients with pathological gambling

R. Ribacoba[1], M. Menendez Gonzalez[2], E. Herrera[3], M. Martinez-Rivera[4], F. Cuetos[3]
[1]Neurology, Hospital Universitario Central de Asturias, Oviedo, [2]Neurology, Hospital Alvarez-Buylla, Mieres, [3]Psychology, Universidad de Oviedo, Oviedo, [4]Geriatrics, Hospital Alvarez Buylla, Mieres, Spain

Introduction: Specific cognitive impairment has been described in individuals with substance abuse and pathological gambling. Pathological gambling also occurs in PD patients on dopaminergic therapy for several years. However, the incidence of pathological gambling in PD and cognitive function in this group of patients is poorly understood yet.
Method: We performed a neuropsychological assessment in 106 consecutive patients with PD without dementia. The neuropsychological battery included the MMSE, objects and actions naming, the Stroop test, the Hanoi tower test, visuographic attention, semantic, episodic and visual memory, verbal fluency and abstraction capacity.
Results: 3 patients out of 106 (3%) suffered from pathological gambling. One of these was on treatment with L-dopa-Carbidopa-Entacapone and the others on L-dopa-carbidopa associated to pramipexole or ropirinole.
In the three cases we observed high interference index in the Stroop test, actions naming difficulties and deficits in abstraction capacities when compared with the rest of the patients.
Conclusions: Patients with pathological gambling showed signs of frontal dysfunction with decreased mental flexibility and difficulties in taking decisions. Our sample is small but it suggests that the presence of frontal dysfunction in PD patients might have a role in the development of addictions.

P2118

The use of rasagiline in clinical practice in Greece

A. Kodounis[1], A.P. Galanopoulos[2], D. Galios[3], V. Kapitzoglou[4], G. Klados[5], E. Makri[6], N. Makris[7], D.D. Mitsikostas[8], G. Varelas[9], I.A. Parashos[2]
[1]Neurological Clinic, 251 Airforce General Hospital, [2]Lundbeck Hellas SA, Athens, [3]Outpatient Clinic, General Hospital 'Achillopouleio', Volos, [4]Neurological Department, Interbalcan Medical Center, Thessaloniki, [5]Neurological Department, General Hospital 'Venizeleio Pananeio', Heraklion, [6]Neurological Clinic, KAT General Hospital, Athens, [7]Neurological Department, General Hospital 'o Agios Andreas', Patras, [8]Neurological Clinic, Navy Hospital of Athens, [9]Neurological Department, General Hospital of Giannitsa, Greece

Objective: To assess the efficacy, safety, and tolerability of rasagiline in a Greek population with Parkinson's disease (PD).
Methods: This open-label six-month study was performed in PD outpatients, evaluated at baseline, 3 and 6 months. Motor function was assessed using 6 cardinal items of Motor-UPDRS: facial expression, tremor at rest, rigidity, gait, postural stability and body bradykinesia-hypokinesia. CGI-S Scale was used to define the severity of PD as follows: mild PD (1,2,3), moderate PD (4) and severe PD (5,6,7). Safety and tolerability was assessed as spontaneously reported adverse events.
Results: The population included 970 PD outpatients, (56.2% men and 43.8% women). The majority of patients were 65-75 years old and classified as mild to moderate PD. 673 patients (69.4%) were receiving concomitant anti-parkinsonian treatment, while 47.3% were taking medication for other diseases. In a sub-study, 425 patients were assessed for Motor-UPDRS items. All 6 UPDRS items studied improved significantly from baseline to last visit by an average of 0.5 points each. In addition, linear regression and univariate analysis showed that improvement was correlated with CGI-S (Kruskal Wallis Test p-value< 0.001) in five out of six UPDRS-items (excluding tremor); severe PD patients improved significantly more than patients with moderate symptoms; and the patients with moderate symptoms improved more than patients with mild symptoms. Mild adverse events were reported by 9.7% of patients.
Conclusions: Rasagiline showed significant efficacy and good tolerability in managing PD symptoms in a representative Greek population of PD patients. Improvement was more pronounced in patients with more severe symptoms.

P2119

The effect of botulinum toxin on auditory symptoms and signs in hemifacial spasm patients

M. Wójcik[1], M. Rudzinska[2], K. Zajdel[3], K. Hydzik-Sobocińska[3], M. Malec[2], N. Grabska[2], A. Szczudlik[2]
[1]Departament of Neurology, University Hospital, Medical College, Kraków, [2]Departament of Neurology, [3]Departament of Otolaryngology, University Hospital, Medical College, Kracow, Poland

Background: Apart from motor symptoms some hemifacial spasm (HFS) patients report the presence of auditory symptoms like hypoacusis, tinnitus or hearing of "clicking" sounds, which are related to the involuntary contractions of the stapedius muscle.
Objective: To evaluate the auditory symptoms and signs in patients with hemifacial spasm before and after botulinum toxin injection.
Material and methods: 20 patients with and 20 without auditory symptoms matched according to age (56±8.53 vs. 59±9.77years) and disease duration (9±6 vs. 9±7 years) were included to the study. The assessment of auditory symptoms was performed using audiometry, tympanometry, audiometric tinnitus measurement and stapedius reflex before and 2 weeks after botulinum toxin type A (BTX-A) injection in facial muscles.
Results: Before BTX-A injection auditory symptoms were reported by 20, and 2 weeks after by 8 patients (χ^2= 9.39, p=0.002). After BTX-A injection, the tinnitus level decreased in 15% of patients with auditory symptoms and increased in 10% of patients without auditory symptoms. There was significant difference in the occurrence of stapedius reflex during the stimulation of affected ear in the ipsilateral ear before and after BTX-A injection (χ^2= 10.47; p=0.001), which was not observed in the contralateral ear (χ^2=0; p-n. s.).During the stimulation of the ear of the other side to HFS there was significant difference in the occurrence of stapedius reflex in the ipsilateral ear before and after BTX-A injection (χ^2=8.73, p=0.031), which was not observed in the contralateral ear (χ^2=2.46, p-n.s.). In audiometry neurogenic type of hypoacusis was found in 95% of patients reported and 85% not reported (χ^2=0.3, p-n.s.) auditory symptoms. Tympanometry did not reveal any abnormalities in the medium ear in 75% patients with and 70% without auditory symptoms.
Conclusion: BTX-A injection influences the function of stapedius muscle of the affected side in HFS patients.

P2120

Trigemino-oculomotor synkinesis with oculo-oculomotor synkinesis caused diplopia

Ö. Karadaş, H. Akgün, Ü.H. Ulaş, Z. Odabaş
Department of Neurology, Gulhane Military Medical Academy, Ankara, Turkey

Marcus Gunn Jaw Winking, also known as Trigemino-Oculomotor Synkinesis was described initially in 1883 by the ophthalmologist Marcus Gunn. Trigemino-Oculomotor Synkineses is an autosomal-dominant condition that characterized by two or more muscles that is independently innervated have either simultaneous or coordinated movements.

Trigemino-oculomotor synkineses has two major groups: 1. External pterygoid-levator synkinesis: When jaw thrusts to opposite side (homolateral external pterygoid) or mouth is opened widely the eyelid raises upon. 2. Internal pterygoid-levator synkinesis: When teeth are clenching, the eyelid raises upwards. The most common group is the external pterygoid-levator synkinesis.

A 20-year-old man was referred to our clinic complaining of droopy left upper eyelid and double vision on looking to the left since birth. Ptosis of the left eye improved when the patient thrust his jaw to right side or opened his mouth widely. As the left eye on the endpoint, the right eye deviated inwards and then to the upward and inward side. It was thought that this case might be a new variant of oculo-ocumatuar synkinesis. There were no abnormal findings in biomicroscopic and funduscopic examinations. Pupillary examinations were also unremarkable. Brain magnetic resonance imaging, electrophysiological studies and laboratory investigations were normal.

Synkinetic aberrant innervation syndromes can involve abnormal movements of multiple extraocular and eyelid muscles. This case report represents a unique case of trigemino-oculomotor synkinesis with oculo-oculomotor synkinesis (medial rectus-superior rectus synkinesis) caused diplopia.

P2121

Evaluation of quality of life of patients with Parkinson's disease

N. Subasic, S. Hajric, J. Djelilović, A. Alajbegović, E. Suljic, D. Imamovic
Neurology Clinic, University Clinical Center, Sarajevo, Bosnia-Herzegovina

Objective of this research is to identify the factors determining the quality of life in patients with Parkinson's disease.

Methodology: Research included 100 patients with established diagnosis of Parkinson's disease. Disease-specific QoL questionnaire (PDQ-39) and Beck Scale of Depression were filled in by the examined persons after eliminatory Mini Mental State Examination (score >23) by the examiners. UPDRS, part III, Hoehn-Yahr Scale and Schwab& Englans Scale were used for evaluation of symptoms and signs of the PD.

Results: Average age of the patients was 62.9±10.03. Related to the age of the patients in time of examination, no statistically significant difference has been noted in the score of quality of life. Length of duration of the disease had significant correlation with the score of quality of life. These findings show worsening of quality of life of the patients with longer duration of disease, but not necessarily with ageing. 38% of examined patients had depressive disorder, and only 37% of the patients were treated. Depressive disorder was significantly more prevalent in patients in whom Parkinson's disease started as right-side hemiparkinsonism and in patients with higher stage of the disease (Hoehn-Yahr Scale stage III and IV).

By applying linear regression analysis, presence of depression, disability measured by Schwab & Englans Scale, stage of disease measured by Hoehn-Yahr Scale and clinical type of disease contributed to low quality of life.

Conclusion: Obtained results point to significance of recognising both motor and non-motor symptoms of disease.

P2122

Association of systemic hypertension with affective symptoms in patients with Parkinson's disease

Z. Tavadyan[1], S. Khachatryan[2], P. Zelveian[3]
[1]Parkinsonism and Movement Disorders Clinic, [2]Center for Neurology and Sleep Medicine, [3]Preventive Cardiology Center, Yerevan, Armenia

Objective: To evaluate relationship of affective symptoms (AS) and systemic hypertension (SH) in patients with Parkinson's disease (PD).
Methods: Three groups were enrolled: PD, PD+SH and SH. Hypertension was diagnosed based on blood pressure measurements ≥140/90mmHg. PD diagnosis was based on UKPDS Brain Bank, accepting Hoehn & Yahr stages 1-4. Hamilton Depression (HAMD) and Anxiety (HAMA) Rating Scales were used for assessment of AS in all groups. HAMD scores: mild (10-16), moderate (17-27), severe (>27). HAMA scores: mild (18-24), moderate (25-29), severe (>29). T-test and ANOVA were used.
Results: PD group: n=60, F=30 (50%), age 42-79 (mean-63). PD+SH group: n=32, F=17 (53.1%), age 53-80 (mean-66). SH group: n=30, F=17 (56.7%), age 28-57 (mean-54). Moderate-to-severe depressive and anxiety symptoms were distributed in groups as follows: PD – 29 (48%) and 7 (11.7%); PD+SH – 18 (56.3%) and 7 (21.9%); SH – 12 (40%) and 2 (6.7%). Comparison of means for three groups regarding AS did not show significant difference ($p>0.05$). Additionally gender analysis was performed. In PD group HAMD means were F:M=17.3:15.9, HAMA: F:M=14.4:11.7, $p>0.05$ for both. In PD+SH group HAMD mean: F:M=22.5:13, HAMA: F:M=21.5:8.9, $p<0.001$ for both. SH group HAMD mean: F:M=16.3:10.3, HAMA: F:M=16.3:9.8, $p<0.01$ for both.
Conclusions: Our results show no difference of AS in relation to SH in all groups. However, gender analysis revealed females had higher AS in hypertensives and parkinsonian hypertensives but not in patients with PD alone. Females are more prone to depression and anxiety in hypertensive groups.

P2123

Motor evoked potentials as a tool for early diagnosis of the periventricular leucomalacia

C.G. Leon Castillo
Enfermeria, Universidad Autonoma de Querertaro, Queretaro, Mexico

Motor evoked potential, a useful tool for diagnosis of demyelinating diseases, the periventricular leucomalacia (PVL) is one of the more frequent perinatal injuries in premature babies. PVL is a demyelinating-like disease, which if not diagnosed early can evolutional a cerebral palsy. We studied 30 babies, 20 of them with LPV and 10 healthy babies. The MEP was obtained by the stimulation of the motor cortex and the spinal cord at cervical and lumbar level. The register of MEP was in the abductor pollicis brevis (APB) and the tibialis anterior (TA). We evaluated for each MEP, latency, duration, amplitude, central conduction time (CCT) peripheral conduction time (PCT), central conduction velocity (CCV) and peripheral conduction velocity (PCV). In the group of healthy babies, the MEPs obtained in the APB the CCT was 12.35ms, and CCV was 17.05m/s. In the PEMs obtained in the TA the CCT was 25.23ms and the CCV was 16.76m/s. In the PVL group, the MEPs of right APB were CCT 23.95 ms and CCV 8.07m/s. In the right TA the CCT 23.52ms and CCV 17.22m/s. A significant difference with control group was found in DPVL and FPVL in CCT ($p<0.05$) and CCV ($p<0.05$) in comparision with healthy babies. The LMP modifies the neuroconduction of the corticospinal pathway, the pattern of PVL is the type of desmielinizantepor which concluded that MEPs are a useful tool for early diagnosis of PVL.

P2124

Genes PARK1 and PARK2 and Parkinson's disease in people of Uzbek nationality

R.J. Matmurodov, K.H.M. Khalimova, M.M. Raimova
Tashkent Medical Academy, Tashkent, Uzbekistan

P2125

MPTP-induced dopaminergic degeneration and deficits in object recognition in rats are accompanied by neuroinflammation in the hippocampus

S.-L. Wu[1,2], H.-N. Sy[3], W.-F. Wang[3]
[1]Neurlology, Changhua Chrisitian Hospital, Changhua, [2]Neurology, Yumin General Hospital, Nanto Tsotung, [3]Neurology, Changhua Chrisitian Hospital, Changhua, Taiwan R.O.C.

P2126

Huntington's disease – clinical aspects: a case series of twenty patients

A.C. Ribeiro, C.S. Santos, A.S. Morgadinho, J.G. Gonçalves
Neurology, Centro Hospitalar de Coimbra, Coimbra, Portugal

P2127

Botulinum toxin-A treatment for oromandibular dystonia

T. Charnukha, S.Likhachev, S. Navosha, Y. Rushkevich
Neurology, National Neurology and Neurosurgery Research Center, Minsk, Belarus

P2128

The symptoms profile of patients with Parkinson's disease: is dizziness an independent symptom in patients with Parkinson's disease?

G. Pandhita[1,2]
[1]Neurology, Pondok Kopi Jakarta Islamic Hospital, Jakarta Timur, [2]Clinical Epidemiology and Biostatistics Unit, Faculty of Medicine Gadjah Mada University, Yogyakarta, Indonesia

P2129

Clinical characterization of myoclonus: clinical series

J. Freitas, M. Magalhães
Neurology Department, Hospital Santo Antonio – CHP, Porto, Portugal

P2130

Neuro-psycho-physiological findings in patients with idiopathic Parkinson's disease

A.N. Taravari, I. Petrov, V. Petrova, M.I. Ismajli-Marku, Igor Petrov, Vera Petrova, M. Ismajli-Marku
Movement Disorders, University Clinic of Neurology, Skopje, FYRO Macedonia

P2131

Benign fibrous histiocytoma of lumbar spine: producing dural sac compression

M. Czeczko[1], A. Ibadi[1], P. Nauman[2]
[1]Neurology Clinic, Sochaczew District Hospital, Sochaczew, [2]Neurosurgery, Institute of Psychiatry and Neurology, Warsaw, Poland

P2132

How to manage black horse of liver transplantation for Wilson's disease by neurologists in the field of movement disorders?

X.-P. Wang[1], R. Yang[2]
[1]Department of Neurology, Shanghai First People's Hospital, Shanghai Jiao-Tong University, Shanghai, [2]Inst of Neurology, Anhui College of TCM, Hefei, China

P2133

Neurological disorders in Alzheimer's disease

L. Zhdaneeva[1], O. Levin[1], S. Gavrilova[2]
[1]Neurology, Centre Extrapyramidal Disease of RMAPDE, [2]Centre of Psychical Health of RAMS, Moscow, Russia

P2134

Clinical experience with Duodopa therapy in Parkinson's disease in Geneva

V. Castillo Cruz[1], R. Mekacher[1], A. Schnider[1], P.R. Burkhard[2]
[1]Neurorehabilitation, [2]Neurology, Geneva University Hospitals, Geneva, Switzerland

P2135
Abstract cancelled

P2136
Eye-of-the-tiger sign in multiple sclerosis: a case report
D. Aygun, M. Terzi, L. Gungor, M.K. Onar
Ondokuz Mayis University, Samsun, Turkey

P2137
Pregabalin in idiopathic restless legs syndrome: a randomized, double-blind, active comparator- and placebo-controlled trial (ongoing clinical trial)
C. Chen[1], R. Allen[2], D. García-Borreguero[3]
[1]Pfizer Global Research & Development, New London, CT, [2]Johns Hopkins Bayview Medical Center, Baltimore, MD, USA, [3]Sleep Research Institute, University of Madrid, Madrid, Spain

P2138
Modern methods of treating depression in PD
O.A. Gileva
Department of Neurology, Neurosurgery and Medical Genetics, Medical Academy, Kemerovo, Russia

P2139
The value of electromyography in the detection of dystonic muscles in spasmodic torticollis
A. Klimasauskiene, I. Maculevicienec
Department of Neurology, Vilnius University Hospital Santariskiu Klinikos, Vilnius, Lithuania

P2140
Cognitive dysfunction in Parkinson's disease (PD) – an Indian study
S. Kushwaha, S. Sharma, P. Raj
Neurology, Institute of Human Behaviour and Allied Sciences, Delhi, India

P2141
Mixed lineage kinase-2 and hippocalcin are localized in Lewy bodies of Parkinson's disease
M. Nagao, H. Hayashi
Tokyo Metropolitan Neurological Hospital, Fuchu, Japan

P2142
Abstract cancelled

P2143
Foetal stem-cells in Parkinson's disease
A.V. Novytska, M.P. Demchuk, O.O. Smikodub, I.V. Arkhipenko
Embryonic Tissues Center EmCell, Kiev, Ukraine

P2144
Can intermittent theta burst stimulation (iTBS) improve speed and dexterity in Parkinson's disease?
S.R. Filipovic[1], N. Kresojevic[1], A. Kacar[1,2], I. Petrovic[2], N. Dragasevic[2,3], M. Ljubisavljevic[1], V.S. Kostic[2,3]
[1]Laboratory for Experimental Clinical Neurophysiology, Institute for Medical Research – University of Belgrade, [2]Institute for Neurology, Clinical Centre of Serbia, [3]Department of Neurology, Faculty of Medicine, University of Belgrade, Serbia

P2145
Dopamine dysregulation syndrome in Parkinson's disease: a case report
D.H. Ertem[1], A.F. Maner[2], A. Koksal[3]
[1]Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases, [2]Psychiatry, [3]Neurology, Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases, Istanbul, Turkey

P2146
Restless legs syndrome and pramipexole
I. Gkogkolakis, E. Nikolakaki, A. Kalamafkianaki, D. Tsiakiris, M. Foutouli, R. Hirmbaki, G. Georgakakis
2nd Neurology Department, Chania General Hospital, Chania, Greece

Cerebrovascular diseases 2

P2147

Significance of the several matrix metalloproteinase expressions for brain infarct size and clinical course of disease in ischemic stroke

M. Beridze[1], R. Shakarishvili[1], N. Lobjanidze[2]
[1]*Neuromedicine, Tbilisi State Medical University,* [2]*Neuromedicine, Khechinashvili University Hospital, Tbilisi, Georgia*

Our study aimed at establishing the significance of several matrix metalloproteinase for brain infarct size and for clinical dynamics of stroke in the first week of disease.
Patients and methods: A total of 65 acute ischemic stroke patients aged 45-70 years were studied. Control comprised 20 age-matched healthy individuals. Brain infarct was detected by conventional MRI at 48 hours after stroke and by conventional CT on the 7th day. Stroke severity at admission and on 7th day was evaluated by the National Institute Health Stroke Scale (NIHSS). Functional outcome on 7th day of stroke was evaluated by modified Rankin Scale (mRS). Pro-inflammatory cytokine IL-6 blood content as well as plasma levels of MMP9 and MMP2 were detected by enzyme-linked immunosorbent assay (ELISA). Statistical Evaluation was conducted by SPSS-11.0.
Results: At 48 hours after stroke blood MMP2 and MMP9 levels were elevated in all patients against control ($p<0.01$), while severe stroke patients with secondary haemorrhage had the elevated MMP9 levels against severe stroke patients without haemorrhage ($p<0.05$) and against relatively mild stroke patients ($p<0.01$). Positive correlation established between IL-6 blood levels and MMP9 contents ($r= +0.21$; $p<0.05$) and between MMP9 blood contents and brain infarct size ($r= +0.37$; $p<0.05$) at 48 hours after stroke. MMP9 plasma levels positively correlated with secondary haemorrhage by 7th day after stroke ($r=+0.41$; $p< 0.05$).
Conclusion: In the acute stage of stroke the high blood expression of MMP9 positively correlates with secondary haemorrhage.

P2148

Abstract cancelled

P2149

Dysphagia: developing a screening tool for patients with cerebrovascular accident

P. Mandysová[1], E. Ehler[2], J. Škvrňáková[3]
[1]*Department of Neurology, Faculty of Health-Care Studies, University Pardubice,* [2]*Neurology, Regional Hospital,* [3]*Faculty Health-Care Studies, University Pardubice, Pardubice, Czech Republic*

Introduction: Dysphagia is a common problem in patients with cerebrovascular accidents (CVA). Many dysphagia screening methods exist, focusing on a water swallow test or on physical assessment of the patient. However, few methods include a swallowing test that uses thickened fluids. The authors describe a research study that aims to fill this gap in existing research and to develop a simple screening tool that could be used to conduct dysphagia screening in patients with CVA and with other neurological diseases.
Methods: The study was initiated on January 1, 2009. Patients with a risk for dysphagia (i.e. mainly CVA patients) were enrolled in the study. A trained clinician performed a bedside examination of swallowing and a swallow test using thickened and unthickened fluids. Fiberoptic endoscopic evaluation of swallowing (FEES) is used as an objective verification method of the swallowing function. Using Rosenbeck's Penetration Aspiration Scale (PAS), the bedside assessment results are compared to the FEES results, which will enable to identify 4-6 factors that are most commonly associated with abnormal FEES and that will form the basis for the creation of a simple swallowing tool.
Results: Results in 44 patients show that some physical assessment and fluid swallow abnormalities are associated with abnormal FEES. An interesting finding is that difficulties with swallowing thickened fluids are associated with high PAS scores.
Conclusion: Further research is being conducted to confirm the emerging trends. The resultant screening tool will be appropriate for CVA patients and for other patients with a risk for dysphagia.

P2150

Optimization of stroke prevention in patients with cerebrovascular failure (results of a 12-year examination)

A.V. Anisimova[1,2], T.I. Kolesnikova[1], K.V. Anisimov[1,3]
[1]Neurology, Russian State Medical University, [2]Neurology, 1st City Clinical Hospital, [3]Neurology, City Clinical Hospital #31, Moscow, Russia

Introduction: Organizational issues of stroke prevention become one of a topical problem due to increase and rejuvenation of disease.
Methods: Complex examination of patients with chronic vascular failure within 2 groups performed (average age 49±6.5 years). Main group (n=102) consisted of 77 patients with high and 25 patients with moderate risk of complications. These patients have complex clinical and laboratory examinations 2 times a year with assessment of cognitive status. Reference group (n=63) included patients with same age and risk level. However, due to personal reasons patients of reference group received treatment irregularly.
Results: During the first 2 years of examination the total number of complications (vascular crises, strokes and transitory ischemic attacks (TIA)) in both groups was almost the same – 57.82 and 56%, respectively. In the main group, hypertonic crises occurred in 56.84%, 1 ischemic stroke (0.98%). In the reference group 52.9% of hypertonic crises, 1 ischemic stroke (1.58%). From the third to the ninth year of examination different changes revealed. In the main group, significant decrease of complications ($p<0.001$) were recorded: hypertonic crises 12.8%, no stroke, TIAs. In the reference group, number of hypertonic crises increased to 84.13% ($p<0.001$), TIAs to 2 (3.17%), strokes (one fatal haemorrhagic stroke) to 3 (4.76%). In the next 3 years in both groups we observed significant ($p<0.002$) slowing-down of previous tendencies, probably related to unavoidable age and genetic risk factors. Significant differences between two groups retained: in the main group, number of hypertonic crises didn't change, 1 TIA occurred (0.98%), no strokes; in reference group 87.1% of hypertonic crises, 1 TIA (1.58%), 3 strokes (4.76%), one fatal haemorrhagic stroke.
Conclusion: During 12 years of examination a designed complex of organizational and preventive steps allowed to decrease the number of acute cerebral complications 8.9 times (in 1.96% and 17.43%) and avoided fatal outcomes in the main group.

P2151

Autophagy in unstable plaques of human carotid atherosclerosis

Y. Cao[1], T. Tong[1], Y. Zhang[1], H. Liu[1], C. Liu[2]
[1]Stroke Unit, [2]Neurology, Soochow University, Suzhou City, China

Background: To investigate the expression of autophagy in human atherosclerotic vulnerable plaques with macrophages, smooth muscle cells (SMC) and endothelial cells (ECs).
Methods: We collected unstable plaques of human carotid atherosclerosis from 9 cases of carotid endarterectomy and observed the histopathologic changes of these unstable plaques through haematoxylin and eosin staining. Then we classified these plaques according to a histological we classification of atherosclerosis from the American Heart Association. The localization co-expression of LC3 in the unstable human atherosclerotic plaques was observed by double fluorescent immunochemistry technology and confocal microscopy. The ultrastructural changes of the smooth muscle cells, endothelial cells and macrophages in human atherosclerotic vulnerable plaques were observed through transmission electron microscopy.
Results: All of these human atherosclerotic plaques had typical histopathologic instability, which was classified as super-IV type unstable plaques. The LC3 co-expression was most obvious in the smooth muscle cells of fibrous cap and in the monocytes in the shoulder of plaques, and the expression of LC3 was observed in the microvascular endothelial cells at the edge of shoulder and necrosis. Transmission electron microscopy of advanced plaques reveals certain features of autophagy in smooth muscle cells, macrophages and endothelial cells such as the formation of myelin figures, vacuolization and the accumulation of inclusions in the cytosol.
Conclusions: LC3 can co-express with monocytes, SMCs and ECs in vulnerable plaques, and the major expression areas are in the fibrous cap, shoulder and micro-vessel at the edge of lipid necrosis. The ultrastructural changes of autophagy can also be observed in smooth muscle cells, macrophages and endothelial cells in these plaques.

P2152

Can batroxobin depress the inflammatory reaction due to mechanical injury of CAS?

G. Xiao[1], Y. Cao[1], X. Zhang[1], C. Zhang[1], C. Liu[2]
[1]Stroke Unit, [2]Neurology, The Second Affiliated Hospital of Soochow University, Suzhou City, China

Background: Few minutes after carotid artery stenting (CAS), the regional coagulation function boosts attributing to the mechanical injury of appliances and makes fibrinogen concentrating and covering the stented vessel. Fibrinogen, a pivotal role in the coagulation cascade, exhibits proinflammatory properties. We investigated whether Batroxobin depresses inflammations reaction due to the injury of CAS appliances by detecting serum C-reactive protein (CRP).
Methods: A total of 40 patients, who presented CAS indications, were divided to group A and B randomly. Both of them were treated regularly with Aspirin and Clopidogrel. Patients in group A were administered 10 Bu Batroxobin less than 24 hours before the procedure. The appliances for group A were also flushed with normal saline adding Batroxobin (10Bu/250ml) during the operation. Serum CRP levels were measured by a high-sensitivity assay in the early morning before CAS and the following morning after the procedure.
Results: Serum CRP levels following the procedure were statistically higher than before that in both groups (median value 9.7 vs. 3.7mg/l in group A, 13.4 vs. 3.9mg/l in group B, $p<0.05$). Serum CRP levels after the procedure between the two groups were also statistically different (median value 9.7 vs. 13.4mg/l, $p<0.05$).
Conclusions: C-reactive protein is a sensitive recd biomarker for inflammation and the study presents a lower level of inflammatory reaction by way of degrading fibrinogen with Batroxobin. Batroxobin may play a potential role in depressing the regional inflammation evoked by the injury of appliances to avoid a higher risk of restenosis.

P2153

Intra-venous thrombolysis for acute cerebral ischaemia seems effective in old stroke patients

G. Boulouis, F. Dumont, C. Cordonnier, M. Bodenant, D. Leys, H. Hénon

Neurologie Vasculaire, Lille University Hospital, Lille, France

Background: Despite increasing life expectancy, few data exist upon outcome after iv thrombolysis in elderly stroke patients, especially when treated within 4.5h.
Methods: We analyzed the prospectively collected data from the Lille University Hospital stroke unit on patients treated with iv tPA within 4.5h comparing patients ≥80 years to the younger. We considered the following outcomes: neurological improvement at the acute phase (defined by the difference between NIHSS score at 24 hours and at baseline), occurrence of intracerebral haemorrhage (NINDS criteria), mortality and functional outcome in survivors (favourable if corrected modified Rankin Scale ≤2) at month 3.
Results: 300 patients were treated with iv rtPA between 09-2003 and 12-2009; 52 (17%) being ≥80 years. At month 3, 42% of patients (95% CI 37-48) had a cmRS 0-1, 55% (95% CI 49 – 60) a mRS 0-2 and 17% (95% CI 12 – 21) were dead. The rates of neurological improvement at the acute phase ($p=0.53$), and of ICH ($p=0.34$) were similar in older and younger patients. Multivariate analysis found age ≥80 years to be an independent predictor of mortality (OR 4.9, 95%CI 2.0-12.3) but not of functional outcome in survivors at month 3.
Conclusion: IV thrombolysis seems safe and effective in very old stroke patients. Age ≥80 years was an independent predictor of mortality but not of poor functional outcome in survivors at month 3.

P2154

Chronic kidney disease as risk of carotid atherosclerosis in apparently healthy adults

W. Takahashi[1], Y. Tsukamoto[1], T. Ohnuki[1], S. Kawada[2], S. Takizawa[1], S. Takagi[1]
[1]Neurology, Tokai University School of Medicine, Isehara, [2]HIMEDIC Imaging Center, Yamanakako, Japan

Objective: Renal dysfunction may be related to cerebrovascular diseases. The aim of this study is to assess the relationship between mild renal dysfunction and atherosclerosis in the carotid arteries detected by ultrasonography.
Methods: 2106 persons (1368 men and 738 women, mean age 56±10 years) without a history of stroke were enrolled in the study. Kidney function was evaluated in terms of estimated glomerular filtration rate (eGFR), calculated by using the relationship 194Cr-1.094×Age-0.287×0.739 (if female), where Cr is serum creatinine concentration. Atherosclerosis on ultrasonography defined as a regional intima thickening or nodular lesion.
Results: Prevalence of any atherosclerotic changes on ultrasonography was significantly correlated with degree of eGFR reduction; in the subgroups with eGFR ≥90, 60~89 and <60ml/min/1.73 m^2, the prevalence was 41%, 43% and 61%, respectively. The odds ratios for atherosclerotic changes of eGFR <60ml/min/1.73m^2 were significantly increased to 1.87 (95% CI: 1.41-2.49), as well as hypertension (2.65, 2.20-3.20), hyper LDL-cholesterolemia (1.50, 1.41-2.49) and hyperglycaemia (1.37, 1.11-1.68).
Conclusion: Mild renal dysfunction may be a risk for carotid atherosclerosis in apparently healthy subjects.

P2155

Predictors of progression of motor weakness in acute pontine infarction

S. Oh, S.J. Kim, C.S. Chung, K.H. Lee, O.Y. Bang, G.M. Kim
Department of Neurology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea

Objectives: Progression of motor weakness is relatively common in acute pontine infarction and frequently associated with an increased functional disability. To identify the predictors of progression of the motor weakness in pontine infarction during the acute phase, we designed this study.
Methods: We identified consecutive patients with acute ischemic stroke in the pons, admitted between January, 2002 and July, 2007. Progression of motor deficit was defined by an increase of grade 1 or more of NIHSS motor score during the first week of symptom onset. To define the predictors of progression of the motor deficits in pontine infarct, clinical, laboratory, DWI lesion location, and MR angiographic variables were investigated.
Results: A total of 130 patients (M:F= 79:31, 65.5±10.59) were identified and 32 (25%) patients had progressive motor deficit. Logistic multiple regression analysis identified the lesion involvement at lower pons (odds ratio (OR), 20.109; P=0.015), high platelet (OR, 1.021; P=0.016), high HbA1c (OR, 1.831; P=0.022) and high CRP (OR, 1.689; 95% P=0.035) were independent risk factors contributing to the progression. There was no relationship between the progression of motor deficits in pontine infarct and the presence of the basilar artery (BA) stenosis.
Conclusions: Our results suggest that the lower pons lesions may be related to progressive motor deficits in isolated acute pontine infarction. Platelet count, HbA1c, and CRP level may also predict the risk for progressive motor deficits. The probable mechanism of progression of motor deficits may be explained by ischemic demyelination of corticospinal tract rather than the hemodynamic compromise due to BA stenosis.

P2156

Combination of tissue-plasminogen activator with erythropoietin induces blood-brain barrier permeability, extracellular matrix disaggregation, and DNA fragmentation after focal cerebral ischemia in mice

A. Zechariah, A. ElAli, D.M. Hermann
Department of Vascular Neurology, University Hospital Essen, Germany

Background and purpose: After 1 clinical study in which recombinant erythropoietin (EPO) protected against ischemic stroke and improved clinical outcome, the German multicenter EPO trial recently reported increased mortality in stroke patients receiving EPO after tissue-plasminogen activator (t-PA)-induced thrombolysis. The reasons for the adverse effects of EPO in t-PA-treated patients are unknown.
Methods: Mice were submitted to 90 minutes of middle cerebral artery occlusion. Immediately after reperfusion, animals were treated with normal saline or t-PA (10 mg/kg). Animals subsequently received injections of normal saline or EPO that were administered after reperfusion and 12 hours later (2500 IU/kg each). Ischemic injury and brain oedema were analyzed at 24 hours after reperfusion by cresyl violet staining and terminal transferase biotinylated-dUTP nick end labelling. Blood brain barrier integrity was assessed by histochemistry for extravasated serum IgG. Matrix metalloproteinase activity was evaluated by gelatinase zymography.
Results: EPO did not influence ischemic infarct size but reduced brain swelling. This effect was abolished by t-PA, which exacerbated serum IgG extravasation in ischemic tissue. Gelatinase zymographies revealed that EPO promoted matrix metalloproteinase-9 activity that was markedly elevated by t-PA. Add-on treatment with t-PA increased the density of DNA-fragmented cells in ischemic tissue of EPO-treated, but not vehicle-treated, mice.
Conclusions: Our data demonstrate a hitherto unknown interaction of t-PA with EPO at the blood-brain interface, i.e., promotion of vascular permeability and extracellular matrix breakdown, which may account for the unfavourable actions of EPO in t-PA-treated patients. After t-PA-induced thrombolysis, EPO may not be suitable as stroke treatment.

P2157

In vitro blood flow and cross-section indices measured using transcranial Doppler ultrasound

S. Wallace[1], K. Faiz[1], N. Logallo[2], C. Lund[1], O.-M. Ronning[1], L. Thomassen[2], R. Brucher[3], D. Russell[1]
[1]Oslo University Hospital, Oslo, [2]Department of Neurology, Haukeland University Hospital, Bergen, Norway, [3]Engineering, Ulm University of Applied Sciences, Ulm, Germany

Aims: The transcranial Doppler (TCD) spectrum may be used to obtain information regarding blood flow and vessel diameter changes. This is possible by calculating the frequency-weighted power of the Doppler spectrum as a flow index. A cross-section area index may then be derived by dividing the flow index by the mean or maximum velocity of the Doppler spectrum. The purpose of this study was to test the accuracy of these indices with different vessel diameters and hematocrit values.
Methods: The study used a closed-loop system with heparinised whole blood. Silicone tubes (1.5, 2, 3, and 4 mm diameters) were insonated using a 2MHZ probe. Instantaneous flow indices (FI), maximum velocities and area indices (AI) and their averages were measured at different flow rates (320, 240, 150 and 320 ml/min) and hematocrit values (10, 20, 29 and 42%) with specially designed software.
Results: The flow index (FI) for each tube diameter with a constant hematocrit showed a strong linear correlation with the actual flow rate (r =1-0.95). The area index (AI) remained relatively constant at different flow rates and the percentage AI showed a strong correlation with tube diameters. The AI values varied significantly, however, when hematocrit values were increased from 10 to 42%.
Conclusions: This in vitro study has shown that relative changes in blood flow and cross-section indices may be measured using TCD. However, it is important to take into account changes in hematocrit values when assessing relative flow changes using frequency-weighted power of the Doppler signal.

P2158

Cerebral hemodynamics and emboli detection during therapeutic catheterization of the left side of the heart in infants and children

S. Wallace[1], G. Dølen[2], C. Lund[1], D. Russell[3], R. Brucher[4]
[1]Dept of Neurology, [2]Dept of Pediatric Cardiology, [3]University of Oslo, Oslo, Norway, [4]Dept of Engineering, Ulm University of Applied Sciences, Ulm, Germany

Aims: Previous studies in adults have shown that left heart catheterization is often associated with cerebral microemboli detected by transcranial Doppler (TCD) and silent cerebral ischemic lesions. This on-going study is using TCD to monitor cerebral hemodynamic changes during therapeutic catheterization of the left side of the heart in infants and children.
Methods: To date, 18 infants and children, mean age 3 years 4 months (range 7 months to 11 years) have taken part in the study. Multifrequency, multi-gate TCD monitoring was used to evaluate cerebral blood flow velocities and the number and types of cerebral microemboli, during the closure of atrial septal defects (ASD) and patent ductus arteriosus (PDA). The number, timing and association of microemboli with the different phases of catheterization were recorded during the procedures and re-assessed off-line.
Results: Cerebral microemboli were detected during all procedures. The total number of emboli during each procedure ranged from 2 to 73, (mean 33.7). 94% of these emboli were classified as gaseous and 6% were classified as solid. The vast majority of emboli (>97%), were associated with specific interventions on the left side of the heart and the aorta, including angiography, the injection of contrast, and the placement of closure devices.
Conclusion: Transcranial Doppler monitoring is an excellent method for monitoring the cerebral circulation during therapeutic catheterization of the left side of the heart in infants and children. Cerebral microemboli were detected during all of the procedures. The vast majority of these emboli were classified as gaseous.

P2159

MicroRNAs as biomarkers in stroke pathogenesis

K. Jeyaseelan[1,2], K.Y. Lim[2], A. Armugam[2], J.R. Tan[2], Y.X. Koo[2], K.S. Tan[3], C.W. Wang[3], C.S.R. Seet[2], B. Chan[2], V.K. Sharma[2], H.L. Teoh[2], N. Venketasubramanian[2], C. Chen[2], E. Yim[2], W.Y. Ong[2], K.H. Chuang[2], Y.H. Chan[2], P.T.H. Wong[2]
[1]Biochemistry, National University Health System, National University of Singapore, [2]The Stroke Program, National University Health System, Yong Loo Lin School of Medicine, Singapore, Singapore, [3]University Malaya, Kuala Lumpur, Malaysia

Background and objective: Stroke forms one of the leading causes of death and disability worldwide. Our previous studies using animal models and young stroke patients have shown that miRNAs present in peripheral blood are temporally regulated during cerebral ischemic conditions. Our hypothesis is that miRNAs could serve as early biomarkers in understanding stroke etiology and pathogenesis.
Methodology: Using brain and blood samples from animal models and blood samples from stroke patients, microRNAs were extracted and tagged with Hy3 fluorescent dye. miRNA profiling was carried out on an miRCURY LNA microarray chips (ver 14.0). The microarray results were confirmed by mRNA arrays, Real-Time PCR and Stem-Loop PCR.
Results: We have identified several microRNAs and their target genes that are involved in endothelial dysfunction, dysregulation of neurovascular integrity, anti-angiogenesis, pro-apoptosis, inflammation and cytoskeletal remodelling.
Conclusion: MicroRNAs form a unique class of endogenous riboregulators that are useful in elucidating the molecular mechanisms underlying stroke pathophysiology.

P2160

Are asymptomatic Hollenhorst plaques a reliable predictor of ipsilateral carotid stenosis and medium term stroke risk?

J. Stephens, K. Abdel-Aziz, P. Enevoldson
The Walton Centre for Neurology and Neurosurgery, The Walton Centre, Liverpool, UK

Introduction: In England, the national diabetic retinal screening programme was set up to aid early identification of diabetic retinopathy and limit visual impairment in diabetic patients. Identification of Hollenhorst plaques usually triggers a referral to the neurovascular clinic for neurovascular investigation. In asymptomatic patients, the predictive value for future ipsilateral hemispheric stroke is thought to be low and therefore the value of carotid duplex is unclear. We reviewed our cohort of patients referred to our neurovascular clinic to determine whether Hollenhorst plaques were a good predictor for significant ipsilateral carotid stenosis or ipsilateral stroke at 12 months.
Method: We retrospectively reviewed our cohort of patients referred from the diabetic retinal screening programme over a 9-year period. The patient demographics, cardiovascular risk factors, carotid duplex findings and subsequent development of ipsilateral hemispheric stroke were recorded.
Results: 36 patients with a mean age of 70.6 years were identified. There were 23 males; 13 females. Of 36 patients, 34 were asymptomatic. Amongst the 34 asymptomatic patients, 2 (5.8%) had a significant (>70%) stenosis of the ipsilateral internal carotid artery on carotid duplex.
Of the asymptomatic patients 1 (2.9%) went on to have an ipsilateral hemispheric stroke within 12 months.
Discussion: Current risk stratification tools such as the ABCD2 and RRE-90 scores reliably predict stroke risk 14 and 90 days following a TIA but there is currently no validated tool for risk stratifying patients with Hollenhorst plaques. Our results suggest that in asymptomatic patients the yield from investigations and annual stroke risk is low.

P2161

Intravenous thrombolysis in elderly acute ischaemic stroke patients adhering to other SITS-MOST criteria: still a controversy

M.A. Karlinski[1], A. Kobayashi[1], T. Litwin[1], A. Członkowska[1,2]
[1]2nd Department of Neurology, Institute of Psychiatry and Neurology, [2]Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Poland

Background: Despite a growing body of indirect evidence, debate on safety and effectiveness of thrombolysis in the elderly remains unresolved. Our aim was to evaluate the outcomes of rtPA treatment in acute ischemic stroke patients aged >80 years compared to those fully adhering to SITS-MOST protocol.
Material and methods: We analyzed the data of 225 consecutive acute stroke patients treated with rtPA in our unit and systematically reviewed their CT images. To minimize the influence of potential confounders we excluded 35 patients not fully adhering to other SITS-MOST criteria and performed multivariate logistic regression.
Results: 20 patients aged >80 years, and 170 served as controls. The elderly had significantly higher median pre-stroke mRS (1 vs. 0 pts.), NIHSS score (17.5 vs. 8 pts.), and more comorbidities. There were no differences in achieving improvement of ≥4 NIHSS pts. at 7th day (50.0% vs. 58.2%). However, the elderly more frequently developed dependency or death (85.0% vs. 40.2%, $p<0.001$), with OR 4.25 (95%CI: 1.00-18.0) in a model adjusted for pre-stroke mRS, baseline NIHSS score, hyperdense artery sign and brain atrophy. There was also a trend towards higher mortality (35.0% vs. 17.1%, $p=0.070$), which was not confirmed in a multivariate model (OR 1.04; 95%CI: 0.32-3.42), and towards higher incidence of haemorrhagic transformation.
Conclusion: Our findings suggest that thrombolysis in patients aged >80 may be associated with less favourable outcome, which cannot be fully explained by worse pre-stroke functional status. Although elderly patients improve after rtPA, additional risk stratification may be required to maximize the benefit.

P2162

Abstract cancelled

P2163

The SNP rs2200733 at chromosome 4q25 is associated with cardioembolic stroke related to atrial fibrillation in the Polish population

M. Wnuk, J. Jagiella, E. Szczygiel, K. Spisak, A. Kepinska, A. Ferens, W. Turaj, J. Burkot, A. Slowik
Department of Neurology, Stroke Unit, Jagiellonian University Medical College, Krakow, Poland

Background and purpose: Recent studies revealed that few single nucleotide polymorphisms (SNPs) at chromosome 4q25, previously associated with atrial fibrillation (AF), were risk factors for ischaemic stroke. We studied the significance of the SNP rs2200733 at chromosome 4q25 in Polish ischaemic stroke patients.
Methods: We genotyped 880 patients and 428 controls. All patients were divided into: large vessel disease strokes (n=129), small vessel disease strokes (n=129), cardioembolic (CE) strokes (n=301), both CE and large vessel disease strokes (n=51), other defined aetiologies of stroke (n=33) and strokes of undetermined etiology (n=237) (TOAST criteria). The vascular risk factors were also recorded. The SNP rs2200733 was analyzed using RT-PCR.
Results: The distribution of the studied SNP was similar among patients (CC: 70.1%, CT: 27.6%, TT: 2.3%) and controls (CC: 71.7%, CT: 25.5%, TT: 2.8%) p=n.s. The T-allele was not a risk factor for all strokes irrespectively of their etiology. The T-allele was not a risk factor for specific stroke aetiologies except for CE stroke, but only when AF did not enter the logistic regression model. CE strokes related to AF (n=197) or not related to AF were different in respect of the distribution of the studied variant and vascular risk factors. The T-allele was an independent risk factor only for CE stroke related to AF (OR=2.14, 95%CI: 1.27-3.61).
Conclusions: CE strokes related and not related to AF should be considered as two different aetiologies of CE strokes classified according to TOAST, since they display a different profile of risk factors.

P2164

Atherosclerotic risk burden in patients with dementia

S.J. Han[1], H.E. Shin[1], B.S. Kim[2], D.W. Yang[3], A.-H. Cho[2]
[1]The Catholic University of Korea, Uijeongbu St. Mary's Hospital, Uijeongbu, [2]The Catholic University of Korea, Yeouido St. Mary's Hospital, [3]The Catholic University of Korea, Seoul St. Mary's Hospital, Seoul, Republic of Korea

Background: The two highly prevalent neurological diseases in the elderly, Alzheimer's disease (AD) and stroke have similar vascular risk factors in common. Atherosclerosis is the most common cause of stroke. Assessment of intima-media thickness (IMT) is a non-invasive tool to evaluate atherosclerotic risk burden in dementia patients, eventually pursuing further stroke prevention.
Objective: We aimed to investigate atherosclerotic burden in dementia patients by assessment of IMT and carotid plaques with carotid duplex ultrasonography.
Methods: We consecutively included patients referred from Mapo-regional dementia centre in Seoul, Korea. The referral criteria were the presence of dementia according to the DSM-IV criteria. As a control group, age and sex-matched cases were enrolled from the health care centre. Brain MRI, blood tests and risk factors evaluation were undertaken. Carotid duplex ultrasonography was performed with the linear-array 7.5-MHz transducers.
Results: A total of 34 patients with dementia was included. The number of patients with increased IMT over 1mm was 24 (70.6%). That with atherosclerotic plaque was also 22 (64.7%), and 17 of those had multiple plaques. In 31 (91.2%) patients, increased IMT or plaques were observed. Regarding the type of dementia, 8/10 patients with AD and 9/10 patients with VD showed increased IMT or plaques. Compared to the control group, the increased IMT or plaques were more common in patients with dementia group (31/34 vs. 23/34, p=0.016).
Conclusions: In dementia patients, atherosclerotic burden such as thickened IMT and plaque was frequently observed. The assessment of atherosclerotic risk burden with carotid duplex ultrasonography seems to be helpful for the prevention of stroke, particularly in patients with dementia.

P2165

Outcome predictors of endovascular recanalization after acute ischemic stroke

S. Singh[1], R. Padmanabhan[1], K. Kane[1], J. Morris[1], S. Nanjudaswamy[1], M. Ramzan[1], D. Paydarfar[1], A. Wakhloo[2], M. Fisher[1], M. Moonis[1]
[1]Vascular Neurology, [2]Interventional Neuroradiology, University of Massachusetts Medical School, Worcester, MA, USA

Objective: Retrospective analysis of ischemic stroke patients (AIS) who underwent endovascular recanalization (ERC) to determine factors that predicted Modified Rankin Scale (MRS) of 2 or less at 90 days.
Methods: 40 patients (22 Male, 18 Female; Mean age 64.43+13.34 years) with pre-morbid MRS of 0-1 were included. The mean NIHSS at admission was 17.33+5.06. Mean time to ERC was 5.38+2.41 hours from onset. ERC (number of patients with respect to time included) within 3 hours (7), between 3 and 6 hours (18), 6-9 hours (11), >8 hours (4). Patients that underwent ERC >3 hours, had a CT-perfusion scan was done before the procedure.
Results: Univariate analyses were performed on demographic and risk factors, pre-stroke medications, complications, and recanalization (Thrombolysis in myocardial infarction [TIMI] grades) to predict 90 day mRs. Univariate predictors of mRs were baseline NIHSS (p=0.009), admission glucose (p=0.082), full recanalization (p=0.002), and post-procedure haemorrhage (p=0.092). In final multivariate analysis, full recanalization (TIMI-3) (p=0.016, OR=17.466) independently predicted positive while baseline NIHSS (p=0.05, OR=0.841) and haemorrhage post procedure (p=0.050, OR=0.153) predicted negative outcome. Time to ERC was not predictive of 90-day outcome (p=0.746) and did not affect rate of haemorrhage (p=0.811) or full recanalization (TIMI-3) (p=0.600).
Conclusion: Irrespective of time to ERC, recananalization (TIMI3) was a strong predictor of good outcome in patients with a CTP mismatch >20% and a relatively normal NCCT. Patients with a salvageable penumbra, irrespective of known time of onset and a normal NCCT should be considered for IA interventions.

P2166

Evaluation of total serum MMP-9 as a marker of carotid plaque instability in patients with carotid stenosis

C. Revnic[1], I. Popescu[2], C. Popa[2], F. Revnic[3], C. Ginghina[4]
[1]UMF Carol Davila, [2]IBCV Vlad Voiculescu, [3]NIGG Ana Aslan, [4]IBCV C.C. Iliescu, Bucharest, Romania

Introduction: Matrix metalloproteinases (MMPs) constitute a family of Zn2+ depending proteinases that have the capacity to degrade all components of the extracellular matrix (ECM).
Aim: Evaluation of total serum MMP-9 as a marker of carotid plaque instability correlated with echo-Doppler findings.
Material and methods: 110 patients (85 males) divided into three groups (44 patients with ischaemic stroke related to carotid stenosis, 36 patients with asymptomatic carotid stenosis and 30 controls) were included in the study.
All patients underwent carotid echo-Doppler examination and serum levels of total MMP-9 were evaluated using Quantikine Human MMP-9 (total) ELISA R&D Systems kits.
Results: Serum MMP-9 levels were highest in the stroke patients group (13.68±11.89ng/ml) compared with asymptomatic carotid stenosis patients (6.94±8.28ng/ml) and controls (2.02±1.08ng/ml), the levels in controls were in the range recommended by the manufacturer of the kits (p=0.002)
Carotid echo-Doppler study showed that in stroke group most of plaques found were echolucent with irregular surface compared with asymptomatic group where echogenic plaques with smooth surface are found frequently (p=0.04).
Conclusions: MMP-9 plays an important role in destabilizing the atheromatous plaques by degrading the collagen fibres in the fibrous cap leading to plaque morphology modifications that are susceptible to thrombosis and distal embolisation.

P2167

Superficial temporal artery-middle cerebral artery (STA-MCA) bypass for severe intracranial steno-occlusive disease prevents cerebral ischemic events in patients with impaired vasodilatory reserve

L.P. Kee, C. Ning, H.L. Teoh, B.P. Chan, B.K. Ong, T.T. Yeo, L.Y. Wong, S. Jie, A.K. Sinha, V.K. Sharma
National University Health System, National University of Singapore, Singapore, Singapore

Background: International Cooperative Study of Extracranial / Intracranial arterial anastomosis (EC/IC Bypass) in symptomatic carotid disease failed to prevent subsequent ischemic events. Subsequent reports found that superficial temporal artery-middle cerebral artery (STA-MCA) bypass could be beneficial in patients with impaired cerebral vasodilatory reserve (CVR). We evaluated CVR in patients with symptomatic & severe steno-occlusive disease of internal carotid (ICA) or MCA to select patients suitable for STA-MCA bypass.
Methods: CVR assessment during voluntary breath-holding was tested with transcranial Doppler (TCD) and acetazolamide-challenged HMPAO-SPECT, according to a standard protocol, in study subjects. Breath-holding index (BHI) <0.69 constituted impaired CVR. Cerebral embolisation was excluded by extended TCD emboli monitoring. Patients with inadequate BHI underwent acetazolamide-challenged HMPAO-SPECT. Patients with significantly impaired CVR on SPECT imaging were offered STA-MCA bypass surgery. All cases were followed up and CVR re-evaluated at 6 months.
Results: 72 patients (51 males, mean age 55 yrs) fulfilled TCD criteria of inadequate CVR. Acetazolamide-challenged HMPAO-SPECT demonstrated impaired CVR in 35 patients and 22 of them underwent STA-MCA bypass surgery. There were no perioperative complications. Early morning headache and lethargy noted in 16 patients resolved completely. 3 (14%) cases in surgery group developed new cerebral ischemic event during follow-up. TCD and acetazolamide-challenged HMPAO-SPECT repeated at 5±2 months after surgery revealed improved CVR in all cases. In comparison, 9/13 (69%) patients on best medical therapy developed new cerebral ischemic events during follow-up.
Conclusion: Symptomatic severe intracranial steno-occlusive disease with impaired CVR carries a high risk of cerebral ischemic events. This risk can be reduced significantly by STA-MCA bypass in carefully selected patients.

P2168

SURF Imaging

K. Evensen[1], A. Dahl[1], R. Hansen[2], B. Angelsen[2], D. Russell[1]
[1]Neurology, Oslo University Hospital, Rikshospitalet, Oslo, [2]Department of Circulation and Medical Imaging, Norwegian University of Science and Technology, Trondheim, Norway

Introduction: Current ultrasound imaging methods show too little contrast differentiation to allow a useful differentiation of stable and unstable carotid artery plaques. One reason is that the image quality in most patients is limited by fundamental acoustic aspects of the imaging method and the interaction of ultrasound with tissues. Strong reflecting tissue layers between the ultrasound probe and the carotid lumen give rise to multiple scattering, often termed pulse reverberations which reduce image contrast resolution.
Methods and results: We have therefore assessed a new method for improved ultrasound imaging. This new method, called SURF (Second order UltRasound Field) imaging uses dual band transmit pulse complexes consisting of both a low frequency (0.5-2 MHz) manipulation pulse and a high frequency (5-20 MHz) imaging pulse which is riding (or SURFing) on the manipulation pulse. With this technique, it is possible to excite the object to be imaged with various pulse complexes, hence enabling the extraction of more information from the tissue. This extra information provides improved imaging of tissue and contrast agents.
Discussion: In vitro studies suggest that SURF imaging improves image quality. This method should now be assessed in the clinical situation since it may provide more accurate carotid IMT measurements and more exact assessments of plaque heterogeneity, the fibrous cap, plaque movement and the evaluation of the vasa vasorum when used with ultrasound contrast agents.

P2169

IL-4 and IL-10 anti-inflammatory genetic polymorphisms in stroke evolution and outcome

S. Marousi[1], A. Antonacopoulou[2], M. Karakantza[3], P. Papathanasopoulos[1], J. Ellul[1]
[1]Dept. of Neurology, [2]Clinical Oncology Laboratory, [3]Dept. of Haematology, Medical School, University Hospital of Patras, Greece

Object: Interleukin (IL) 4 and IL10 are major anti-inflammatory cytokines, implicated in the counteraction of the detrimental, pro-inflammatory activation which promotes ischemia-reperfusion injury. Our object was to investigate whether two functional single-nucleotide polymorphisms, IL4-589C>T and IL10-1082G>A, might be associated with ischemic stroke (IS) severity, evolution, and outcome.

Method: 145 consecutively admitted IS patients were genotyped for IL4-589C>T and IL10-1082G>A using a prototypically designed real-time PCR technology, without fluorescence probes. Scandinavian Stroke Scale was used for clinical assessments on days 1, 3 and 7. Stroke severity grouping, and early or late stroke progression were defined according to published international agreements. Functional outcome was evaluated on months 1, 3, and 6 using the Barthel Index.

Results: In a regression model adjusted for age, sex and vascular risk factors, we found a significant predictive role of the IL4-589 T-allele into IS recurrences (OR=3.34, 95%CI=1.18-9.45). The same analysis was applied for IL10-1082, and showed that presence of the GG genotype was associated with early stroke progression (OR=3.715, 95%CI=1.28-10.76), and worse functional outcome on month 1 (OR=5.027, 95%CI=1.15-21.94) and month 3 (OR=5.84, 95%CI=1.07-31.85). Analysis for outcome was further adjusted for stroke severity and TOAST categories.

Conclusions: The IL4-589C>T functional polymorphism may predict IS recurrences, whereas the IL10-1082G>A might be associated with stroke progression and functional outcome by month 3. Cost-effective identification of genetically predisposed subjects will allow in the future for early recognition of those IS sufferers, who would most benefit from intensive rehabilitation programs, and optimization of medical therapies.

P2170

Intracranial stenosis in a Norwegian ischemic stroke population

N. Logallo[1], H. Naess[1], U. Waje-Andreassen[1], L. Thomassen[2]
[1]Neurology Department, Neurovascular Section, Haukeland University Hospital, [2]Department of Clinical Medicine, University of Bergen, Bergen, Norway

Introduction: Intracranial stenosis is an important cause of ischemic stroke worldwide. However, prevalence of intracranial stenosis in unselected ischemic stroke patients in Northern Europe is unknown. We aimed to evaluate the prevalence of intracranial stenosis in a well-defined community based ischemic stroke population using a multi-modal non-invasive approach.

Methods: In a prospective study, all patients admitted with TIA or ischemic stroke underwent MR-Angio and/or CT-Angio, and standardized Transcranial Color-Coded Sonography (TCCS) examination. Criteria for the diagnosis intracranial stenosis were positive findings on at least two of the modalities MRA, CTA, and TCCS.
Criteria for symptomatic stenosis were 1) presence of DWI-MR signal attenuation in the territory supplied by the stenotic artery and 2) absence of more likely causes of ischemic stroke.

Results: Among 180 patients (173 with stroke, 7 with TIA) included over a 7-month study period, 30 (16.7%) presented 42 intracranial stenosis of any grade, 17 (40.5%) of which were symptomatic. 17 patients (9.5%) presented 17 symptomatic stenoses and 10 asymptomatic stenoses. 13 patients (7.2%) presented 15 asymptomatic stenoses.

Conclusion: Intracranial stenosis represents the cause of ischemic stroke in ~10% in this Norwegian stroke population. Approximately 40% of intracranial stenosis are symptomatic.

P2171

Interventional closure of symptomatic PFO carries low risk of procedure-related embolic events

J. Staszewski[1], M. Zarebinski[2], M. Zienkiewicz[2], A. Stepien[1]
[1]*Clinic of Neurology, Military Institute of Medicine, Warsaw,* [2]*Interventional Cardiology Department, Specjalistyczny Szpital Zachodni, Grodzisk Mazowiecki, Poland*

Paradoxical embolism via patent foramen ovale (PFO) is an important cause of stroke in young patients. Embolisation of small-sized venous thrombus or platelet aggregate was proposed to be the leading mechanism precipitating migraine with aura (MWA) in patients with PFO. Transcatheter PFO closure is considered to carry a low procedural risk and to be technically feasible with a high primary success rate. There are however no data for the rate of procedure-associated silent embolic events. The present study was aimed to analyze the total number of cerebral ischemic complications with interventional PFO closure. 17 symptomatic PFO patients (12 female, 22-56 years): 10 with history of past ischemic stroke, 7 with MWA and documented by the diffusion-weighted imaging (DWI) MRI presence of white matter lesions were qualified for the transcatheter closure of PFO using intrasept occluder. All of the patients had DWI MRI performed before and after PFO closure and received aspirin (75mg/daily) and clopidogrel (75mg/daily) after the procedure. In the MRI examinations following the intervention, new microembolic lesions were found in only 1 of 17 (5.8%) patients. These lesions were clinically unapparent and were found in the right frontoparietal white matter in a patient aged 56, who was qualified for the PFO closure due to past stroke. No symptomatic microembolic events were noticed among the studied patients. Although this study was based on a small number of patients it provides first evidence of low frequency of closure associated silent cerebral embolisms after interventional PFO closure in patients with stroke or MWA.

P2172

Involvement of Notch1 signalling in neurogenesis in the subventricular zone of normal and ischemic rat brains in vivo

K. Jin, X. Wang, X. Mao, L. Xie, D.A. Greenberg
Buck Institute for Age Research, Novato, CA, USA

The Notch1 signalling pathway is regarded as one of the main regulators of neural stem cell behaviour during development, but its role in the adult brain is less well understood. We found that Notch1 was mainly expressed in doublecortin (DCX)-positive cells corresponding to newborn neurons, whereas the Notch1 ligand, Jagged1, was predominantly expressed in glial fibrillary acidic protein (GFAP)-positive astrocytic cells in the subventricular zone (SVZ) of the normal adult brain. These findings were confirmed by conditional depletion of DCX-positive cells in transgenic mice carrying herpes simplex virus thymidine kinase (HSV-TK) under the control of the DCX promoter. In addition, the activated form of Notch1 (Notch intracellular domain, NICD) and its downstream transcriptional targets, Hes1 and sonic hedgehog (Shh), were also expressed in SVZ cells. Increased activation of Notch1 signalling increased SVZ cell proliferation, whereas inhibiting Notch1 signalling resulted in a reduction of proliferating cells in the SVZ. Levels of NICD, Hes1, and Shh were increased in the SVZ at 4 and 24h after focal cerebral ischemia. Finally, ischemia-induced cell proliferation in the SVZ was blocked by inhibition of the Notch1 signalling pathway, suggesting that Notch1 signalling may have a key role in normal adult and ischemia-induced neurogenesis.

P2173

Temporal orienting and time perception in brain injured subjects

F. Piras[1], M. Pazzaglia[2], J. O'Reilly[3], L. Pizzamiglio[4,5], A.C. Nobre[6]
[1]Institute of Medical Psychology and Behavioral Neurobiology, Eberhard-Karls-University, Tübingen, Germany, [2]Centro Ricerche di Neuropsicologia, IRCCS Fondazione Santa Lucia, Rome, Italy, [3]FMRIB Centre, University of Oxford, UK, [4]Laboratorio di Neuropsicologia, Universita' Sapienza, Rome, [5]Centro Ricerche di Neuropsicologia, IRCCS Fondazione Santa Lucia, Roma, Italy, [6]Department of Experimental Psychology, University of Oxford, UK

No previous studies investigated the effect of a cerebral lesion on the ability to build up temporal expectations to predict stimulus onset (implicit timing). Here we aimed to identify, through the lesion behaviour method, brain regions involved in explicit time estimation as opposed to areas implicated in implicit timing. Our explicit temporal generalization task required overt estimation of a filled interval, visually presented, while the implicit temporal orienting task entailed the integration of temporal (speed of motion) and spatial information (rectilinear motion and distance travelled) to predict when a stimulus was likely to appear (O'Reilly & Nobre, 2008). 26 patients with ischemic stroke (13 right and 13 left brain damaged) were tested and their performances compared to data from a normative sample. Behavioral analysis revealed that while both brain damaged groups showed an abnormal variability in the temporal expectancy task, a deficit in temporal prediction was more frequently associated with a right lateralized lesion. Lesion mapping showed that the integrity of a bilateral fronto-parietal network and right basal ganglia is necessary for the prospective modelling of temporal perceptual stimuli. To the best of our knowledge this is the first substantiation of a deficit in temporal orienting in a population of unilateral brain damaged patients. A second finding is that right brain damaged patients showed higher variability in the temporal domain regardless of the processing (either explicit or implicit) required. This result complements the evidence for a positive association between abnormal timing variability and right hemispheric lesions (e.g. Kagerer, 2002).

P2174

Hereditary cerebral small vessel diseases in Japan: CADASIL and NOTCH3 non-related CADASIL-like syndrome

T. Mizuno[1], I. Mizuta[1], K. Saigo[1], A. Hosomi[1], T. Kasai[1], Y. Nagakane[1,2], M. Makino[3], M. Nakagawa[1]
[1]Neurology, Kyoto Prefectural University of Medicine, [2]Neurology, Kyoto Second Redcross Hospital, [3]Neurology, Kyoto First Redcross Hospital, Kyoto, Japan

Background: Autosomal dominant hereditary cerebral small vessel diseases (ADHCSVD) can be divided into two types, CADASIL caused by the NOTCH3 mutation (NOTCH-C) and the NOTCH3 non-related CADASIL-like syndrome (Non-NOTCH-C). To clarify rates and clinicoradiological features of NOTCH-C and Non-NOTCH-C, we evaluated Japanese patients with ADHCSVD.
Subjects and method: Subjects included 32 Japanese patients with multiple lacunar infarctions and cerebral white matter lesions in 29 families with autosomal dominant inheritance. After screening 2 – 23 exon(s) of NOTCH3 using denaturing high-performance liquid chromatography, mutations were confirmed by direct sequencing. Clinicoradiological features of Non-NOTCH-C were compared with those in NOTCH-C.
Results: Of the 32 patients, 22 were determined to have 10 different point mutations of the NOTCH3 and 10 to have no mutation of the NOTCH3. The average onset age was 51.7 years in NOTCH-C and 58.6 years in Non-NOTCH-C. While all NOTCH-C patients had granular osmiophilic material (GOM) in skin biopsies, Non-NOTCH-C patients had no GOM. Vascular parkinsonism, pseudobulbar palsy and dementia were observed in Non-NOTCH-C more than in NOTCH-C. Migraine and white matter lesions at the temporal pole identified by MRI were observed in NOTCH-C more than Non-NOTCH-C.
Conclusion: We identified NOTCH3 mutations in two-thirds of Japanese ADCSVD patients and no NOTCH3 mutation in one-third of Japanese ADCSVD patients.

P2175

Automation of neurobehavioral assays for the mouse stroke model assessment at homecage using SmartCage™ system

X.S. Xie[1], L. Xu[2], X. Xiong[2], B. Zou[1], J. Xie[1], J. Zhang[1], R. Giffard[2]
[1]AfaSci Research Laboratory, AfaSci, Inc., Redwood City, [2]Department of Anaesthesia, Stanford University School of Medicine, Stanford, CA, USA

Introduction: Middle cerebral artery occlusion (MCAO) in rodents creates a wide spectrum of behavioural phenotypes mimicking human stroke symptoms. Characterization of rodent stroke models and evaluation of treatments has relied on neurological scoring or the use of separate apparatuses for each assay.
Aims of study: To develop automated, more objective assays for quantitative and long-term evaluation of neurological outcome following MCAO stroke in mice.
Methods: We used SmartCage, a homecage behaviour monitoring system (developed by AfaSci), composed of infrared (IR) matrices for position and locomotion detection, floor-sensor for wake/sleep monitoring, and cognition test with touch-screens. We created new modules of rotarod, dark box and 'cagemate' enclosures, with special software to enhance the homecage assay specificity, comprehensiveness and level of automation for the MCAO functional assessment.
Results: The impairment in homecage activity (IR beam breaking count and active time), locomotion (travelling distance and speed) and rotarod test (duration of staying on the rotating rod and number of spontaneous performances) were correlated well with the severity of neurological scores, and associated with the occlusion time (0 as sham control, 30 and 60 min) and infarct size determined at 24 hours after reperfusion. The longer-term MCAO recovery study is ongoing to assess any anxiety-like behaviour using dark box, social interaction changes with 'cagemate' enclosure and cognition deficits using touch-screens.
Conclusions: Homecage behavioural assays using multiple biosensors and modular devices integrated in the SmartCage™ system are sensitive enough to assess MCAO behavioural changes and to evaluate its treatment effects on stroke models.

P2176

Clinical outcome and therapeutical options in patients with Internal Carotid Artery Occlusion

J.S. Freitas[1], A. Geraldo[1], H. Costa[1], E. Ribeiro[2], N. Mendonça[1], F. Silva[1], C. Ruivo[3], C. Nunes[4], G. Cordeiro[1], L. Cunha[1]
[1]Neurology, Coimbra University Hospital, Coimbra, [2]Internal Medicine, Infante Dom Pedro Hospital, Aveiro, [3]Radiology, [4]Neurorradiology, Coimbra University Hospital, Coimbra, Portugal

Introduction: The wide spectrum of clinical and prognostic outcomes of patients with Internal Carotid Artery occlusion (ICAO) has aroused clinical debate and concern for many years.
Aims: To evaluate clinical prognosis and recent therapeutical options in patients with ICAO.
Methods: We analyzed all patients with ICAO confirmed by angiography and/or CT angiogram, diagnosed between January/2006 and March/2009. Clinical and therapeutical data were collected from clinical files and completed by phone interview when necessary.
Results: 53 patients were identified (average age 66.8 years) with a mean follow-up of 32 months (12-51). In 32% the occlusion was asymptomatic. From those with symptomatic occlusion 36% had minor stroke or TIA. The etiology was dissection in 19% and ateromatous in the remaining. Average Modified Rankin Scale was 2.2 at 3 months, 2.1 at 1 year and 2.2 at 2 years. Death rate was 6%, 8% and 22% (3 months, 1 and 2 years). One patient had ipsilateral recurrence of stroke (2% of population), within the first month of diagnosis. Contralateral stroke risk at 2 years was 5%. Hypertension was present in 77%, dislipidemia in 72% and diabetes mellitus in 17%. No patient on oral anticoagulation had new symptoms (21%, with dissection or cardioembolic risk). From those on double anti-platelet therapy (9), there were 2 ischemic strokes and one hemorrhagic stroke. There were no recurrences among those with contralateral endarterectomy.
Conclusions: This subset of patients showed a relatively good clinical prognosis. We observed a low risk of ipsilateral recurrence of stroke.

P2177

Serum heart-type fatty acid-binding protein level measurement for diagnosis and prediction of prognosis in acute ischemic stroke: a comparative analysis with serum S100β protein level

S.-H. Oh[1], Y.-D. Kwon[2], M.-W. Kim[1], J.-S. Moon[1], W.-C. Kim[1], M.-J. Baek[2], H.S. Kim[1]
[1]Department of Neurology, CHA University College of Medicine, [2]Institute for Clinical Research, CHA University School of Medicine, Seongnam-si, Republic of Korea

Background: Heart-type fatty acid-binding protein (H-FABP) is known to be rapidly released from damaged neuron in brain injury. However, few studies investigated the usefulness of serum H-FABP as a surrogate marker for prediction of diagnosis and prognosis of ischemic stroke. We performed a comparative analysis between serum H-FABP and S100β protein concentration in patients with acute ischemic stroke(AIS).
Methods: We included 92 consecutive patients (65±11 yrs old, men=52.2%) with AIS and 34 control subjects (61±10 yrs old, men=47%). Serum H-FABP and S100β level were measured by ELISA method within 24 hours of stroke onset. Clinical severities were evaluated by NIHSS scores and mRS score. Computer-assisted infarct volume analysis was performed to evaluate the severity of neuronal damage.
Results: Serum S100β level was higher in the stroke group than in controls (2.2±3.8 vs. 0.4±0.9ng/ml, $p<0.001$), but serum H-FABP level were not different (19.8±33.3 vs. 11.5±15.7ng/ml, $p=0.065$). Infarct volume was highly correlated with serum S100β ($r=0.8$, $p<0.001$) but not with H-FABP ($r=0.1$, $p=0.9$). ROC curve for discriminating stroke and control showed high diagnostic values of S100β (AUC: 0.73, $p<0.001$, sensitivity: 69%, specificity: 71%) but not of H-FABP (AUC: 0.57, $p=0.23$). The ROC curve for discriminating good and poor prognosis showed high predictive values of both the S100β (AUC: 0.80, $p<0.001$, sensitivity: 73%, specificity: 76%) and H-FABP (AUC: 0.71, $p=0.001$, sensitivity: 63%, specificity: 62%).
Conclusion: We suggest that measurement of serum S100β protein level is superior to that of serum H-FABP level for the diagnosis and prediction of prognosis in ischemic stroke.

P2178

Metformin prevents focal cerebral ischemic injury via AMPK/mTOR/S6 signalling pathways in a mouse model

Y.-J. Ahn[1], S.-K. Hwang[1], S. Han[2], M.A. Moskowitz[3], J.K. Liao[1], H.-H. Kim[1]
[1]Cardiology, Brigham and Women's Hospital and Harvard Medical School, Cambridge, [2]Neurology, Massachusetts General Hospital and Harvard Medical School, Boston, [3]Neurology and Radiology, Massachusetts General Hospital and Harvard Medical School, Charlestown, MA, USA

Metformin has been used for glucose control in diabetic patients, regulating AMPK pathway. Notably, it was also shown to be involved in focal cerebral ischemia, showing that acute hyperglycaemia increased infarct volume when compared to normoglycaemic mice. However, the mechanism remains still unknown. In this study, we tested the effect of metformin in transient focal cerebral ischemia model. Metformin was orally administered (10, 30, 100, and 300mg/kg; 1 hour before MCAO) and blood glucose level was measured before and after metformin administration. Infarct size was measured with TTC staining and protein levels were assessed in ischemic core and contralateral (non-ischemic core) hemisphere region. Infarct size (mm^3) decreased in hypoglycaemic mice (100 and 300mg/kg metformin-treated group; 36.7±7.4, $p<0.05$ vs. control, $n=7$; 300mg/kg: 18.4±9.6, $p<0.01$ vs. control; $n=4$), compared with control (65.2±11.1, $n=7$). Blood glucose (mg/dl) increased in MCAO group (251.6±8.2) and decreased in metformin-treated group (30mg/kg: 111.3±14.4; 100mg/kg: 53.5±7.6; n= 5~7) during MCAO. AMPK became phosphorylated and the phospho-S6 level, the downstream effector of mTOR signalling pathway, decreased after MCAO in control group. However, phospho-AMPK level was decreased in a dose-dependent manner and phospho-S6 level was up-regulated in the metformin-treated group. These findings indicate that metformin decreased blood glucose level and reduced infarct size via AMPK/mTOR/S6 pathway.

P2179

Efficacy of lerkanidipine in prevention and treatment of cardio- and cerebrovascular disease in patients with arterial hypertension

N. Salimova
Republican Specialized Center of Cardiology, Tashkent, Uzbekistan

Aim: To determine efficacy of lerkanidipine in prevention and treatment of cardio- and cerebrovascular disease in patients with arterial hypertension (AH).
Materials and methods: 90 patients with AH and cardio- and cerebrovascular disease were observed. By type of antihypertensive therapy, patients were divided into two comparable groups: in control group patients (n=30) treated with bisoprolol (2.5-5mg/day) and indapamide (2.5 mg/day); in main patients' group (n=60) – added lerkanidipine (10-30mg/day). All patients, before and after 6-month treatment, were carefully observed to determine cardiological and neurological status by means of modern cardio- and neurophysiologic, Doppler-graphic and visualizing equipment based diagnostic methods. Following parameters were observed as final points after 6-month treatment: TIA – transitory ischemic attacks, II – ischemic insult, US – unstable stenocardia, MI – myocardial infarction, HF – heart failure.
Results: Comparative analysis of final points in main and control groups showed that TIA and acute coronary syndrome were monitored in 1.6% patients in group of lerkanidipine. In control group, frequency of TIA was 6.7%, US – 6.7%, MI-3.3%, HF- 6.7%, and was more frequent than in the main group (Ð<0.005).
Conclusion: Treatment with lerkanidipine in addition to bisoprolol and indapamide in AH patients significantly increases cardio- and cerebrovascular treatment potential, and prevents of new cardio- and cerebrovascular events.

P2180

Effects of BMSCs on the expressions of angiopoietin 1, 2 and their receptor in the cerebral ischemia-reperfusion regions of rats at the recovery stage

Y. Zhang
Department of Neurology, Nanjing Brain Hospital / Nanjing Medical University, Nanjing, China

Objectives: To explore the effects of bone marrow mesenchymal stem cells (BMSCs) on the expressions of angiopoietins 1,2 (Ang-1,2) and their receptor in the cerebral ischemia-reperfusion regions of rats at the recovery stage.
Methods: Male SD rats were divided into sham-operated, control and BMSCs transplanted groups, randomly. The MCAO model was established with Longa method, modified adhesive removal test was carried out for assessing neurological function, after MCAO 21 days. BMSCs transplanted group was administrated BMSCs through tail vein, control group was administrated the same volume of PBS, there was no intervention for the sham-operated group. The rats were sacrificed at days 7, 14, 21 after BMSCs administration and so divided into three sub-groups. RT-PCR and Western blotting were performed for the mRNA and protein detection of Ang-1,2 and their receptor (Tie-2) in the ischemic boundary tissues.
Results:

A. Compared with that of the controls, the neurological function of BMSCs transplanted group was significantly improved.
B. Compared with those in the controls, the mRNA and protein of Ang-1 and Tie-2 showed increasing expressions in the BMSCs transplanted group after administration 7d and 14d, with a significant difference, however, no significant difference was found after administration 21d between different groups, neither the mRNA and protein of Ang-2 expressions.

Conclusions: Administration of BMSCs at the recovery stage of MCAO may improve the neurological functions, the mRNA and protein of Ang-1 and Tie-2 in the cerebral ischemic boundary tissues showed increasing expressions at least 14 days post-administration; however, no difference was found for Ang-2.

P2181

Bone marrow stromal cells induce cell cycle arrest in injured astrocytes

Y. Zhang
Department of Neurology, Nanjing Brain Hospital / Nanjing Medical University, Nanjing, China

Transplantation of bone marrow stromal cells (BMSCs) decreased astrocytic apoptosis, reduced astrogliosis and the thickness of scar wall, and improved animal neurological functional recovery after brain damage. To obtain the mechanisms underlying this process, whether BMSCs could modulate cell cycle machinery in injured astrocytes were investigated in this study. Cell cycle proteins, cyclin D1, cdk4 and proliferating cell nuclear antigen (PCNA) was induced in injured astrocytes in vitro or in the middle cerebral artery occlusion (MCAO) model of rats. However, BMSCs administration significantly inhibited the expression of cell cycle proteins and astrogliosis-associated changes in these situations. Flow cytometry showed that cell cycle progression was blocked at S-phase in the astrocytes by BMSCs. These data indicated that BMSCs might target a signalling pathway involved in not only downregulating the cyclin D1-cdk4 complex but also upregulating p27 expression in injured astrocytes. An inhibitor of inducible nitric oxide synthase largely reversed this effect in vitro, suggesting that nitric oxide played an important role in the interaction between BMSCs and astrocytes. The phenomenon that BMSCs conferred decline of astrogliosis post-ischemia may derive from inhibiting cell cycle progression in astrocytes. This experiment may be an additional evidence that BMSCs have an effect of modulating cell cycle outside the immune system.

P2182

Bone marrow stromal cells promote the recovery from stroke by inhibiting cell cycle of neural cells in rats

Y. Zhang
Department of Neurology, Nanjing Brain Hospital / Nanjing Medical University, Nanjing, China

Transplantation of bone marrow stromal cells (BMSCs) improves animal neurological functional recovery after stroke. But the mechanism is not clear as yet. As cell cycle machinery plays an important role in stroke, we investigated cell cycle elements expression in a rat model of middle cerebral artery occlusion (MCAO) with or without BMSCs transplantation. We found that the cell cycle markers, cdk4 and its cyclin partner cyclin D1 increased from 24h after ischemia-reperfusion in the MCAO model and decreased gradually at day 7. Similarly, phosphorylation of the retinoblastoma protein (pRb), the cyclin D/cdk4 complex mutual target, was upregulated at 12h, peaked at 72h and decreased at day 7. Proliferating cell nuclear antigen (PCNA), an S-phase marker, also increased. On the contrary, intravenously administrated BMSCs facilitated cyclin D1 and cdk4 decrease at early time and phosphorylated pRb was downregulated accordingly. Meanwhile PCNA decreased at 24h after BMSCs transplantation. Interestingly, p27 did not show any change at molecular expression and dramatically decreased at protein level in the absence but enhanced in the presence of BMSCs. These findings showed that BMSCs might lead to cell cycle arrest in the injured brain via the down regulation of cyclin D/cdk4/pRb pathway as well as up regulation of p27 level. It can also explain the treatment effect of BMSCs for stroke. This experiment may be an additional evidence that BMSCs have an antiproliferative modality outside the immune system.

P2183

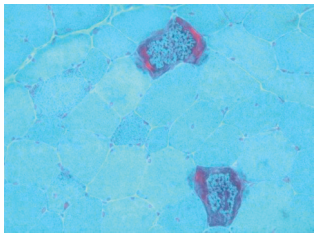
Atypical presentation of MELAS syndrome

L. Letra, F. Matias, N. Mendonça, P. Nunes Vicente
Department of Neurology, University Hospital of Coimbra, Coimbra, Portugal

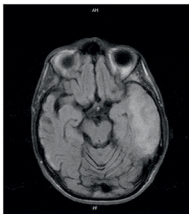
Introduction: Mitochondrial myopathy, encephalopathy, lactic acidosis, and stroke (MELAS) syndrome is a rare multisystem disorder with typical onset in childhood caused by point mutations in mitochondrial DNA (MT-TL1 gene encoding tRNALeu(UUR)). The most common initial symptoms are generalized tonic-clonic seizures, recurrent headaches, anorexia, recurrent vomiting and sensorineural hearing loss. Seizures are often associated with stroke-like episodes of transient hemiparesis or cortical blindness that may be recurrent and associated with altered consciousness. However, clinical and imaging presentation of MELAS can be extremely variable and mimic herpes simplex encephalitis (HSE) leading to inappropriate investigation and treatment procedures.

Case report: We describe a 28-year-old man presenting with 2 acute episodes of behavioural and speech disorder with focal deficits (hemianopsia and hemiparesis) and parieto-temporal lesion on MRI (first on the right and later on the left hemisphere), that were interpreted and treated as herpetic encephalitis. These episodes had a 6-month interval with clinical and imagiological improvement. The diagnosis of MELAS was suspected based on his phenotype and personal history of hypogonadism and hypothyroidsm. The diagnosis was confirmed by histological and genetic analyses of muscle biopsy.

Conclusion: Adult-onset MELAS may present as an atypical and recurrent form of herpetic encephalitis and should be considered in its differential diagnosis. Based on clinical history and diagnostic suspicion, an exhaustive imaging and laboratory study as well as inappropriate treatment will be avoided.



[Muscle biopsy showing red ragged fibres (400x)]



[MRI T2-weighted image of left temporal involvement]

P2184

Dipyridamole: use in ischaemic stroke and effect of headache on compliance

G. Doolub, R. Bate
Churchill Hospital, Oxford, UK

Background: Stroke is the most important cause of mortality and morbidity in Europe. In the UK, 23% of patients die within 30 days of having a stroke. Of the initial survivors, only a third are alive after three years – 30% remain disabled. Patients suffering from ischaemic stroke are at risk of recurrence, with an annual risk of 5-15%. Trials have shown that risk reduction of stroke is improved when dipyridamoleMR is added to aspirin. However, one adverse effect is headache.

Aims: This study compares dipyridamole use in hospitals with European and national guidelines in terms of:

i. time started,
ii. dosage,
iii. duration of use and how compliance is affected by headache (guidelines recommend starting 200mg BD at 14 days for a duration of 2 years).

Methods: Retrospective audit examining patients admitted with acute stroke between January 2009 and June 2009. Data were obtained from patient notes, clinic letters, and telephone conversations with GPs. 32 patients were obtained. Haemorrhagic strokes were excluded.

Results: 2 patients were not started on dipyridamole, one of which was justified. Amongst the remaining, half were started on dipyridamole at the wrong time. A third was started on an incorrect dose. At 6 months, 7% of patients had their dose reduced due to headaches, while a further 20% had to stop dipyridamole completely, two of which presented to A&E with severe headache.

Conclusion: Dipyridamole use does not meet national targets. Poor compliance was observed due to headache, although titrating the dose down does seem to improve tolerance.

P2185

Hypertension and stroke

V. Andrejic Kovandzic, S. Medic
Clinical Hospital Centre, KBC 'Dr Dragisa Misovic', Belgrade, Serbia

Hypertension is the most important risk factor for stroke. The aim was to establish a correlation between hypertension and severity of stroke, mortality and recovery after stroke.
Method: We analyzed 300 patients with acute stroke (252 hypertensive – 84% and 48 non-hypertensive – 26%). In the first group were 130 patients with long-lasting hypertension and 81 with untreated hypertension). The basic neurological impairment was assessed by NIHSS and patients were divided into two groups: patients with severe stroke – NIHSS >21 and the group with NIHSS <21. Follow-up was investigated 4 weeks after admission with assessing Barthel Index and Modified Rankin Scale.
Results: 31 patients had severe stroke with hypertension ($p<0.01$). During hospitalization 34 patients died – 26 hypertensive and 8 without hypertension ($p>0.05$); 17 patients were in the group with long lasting hypertension ($p<0.05$); 28 days after admission the number of death was 57 – 40 patients were with hypertension ($p<0.01$). Modified Rankin Scale >3 had 15 non-hypertensive patients and 112 patients with hypertension ($p>0.05$); 44 patients were with untreated hypertension ($p<0.01$); BI <70 had 107 hypertensive and 14 non-hypertensive patients ($p>0.05$); it was statistically significant ($p<0.01$) in the group of 40 untreated patients.
Conclusion: Patients with hypertension have more severe stroke and higher 28-day mortality. Patients with untreated hypertension have poorer functional outcome.

P2186

The insertion/deletion (I/D) polymorphism of the angiotensin-converting enzyme (ACE) gene determines type of acute stroke

O. Dubenko[1], S. Kostukovsky[2], D. Krasuk[2], A. Kostukovskaya[3]
[1]Neurology and Neurosurgery, Kharkiv Medical Academy of Postgraduate Education, [2]Kharkiv City Clinical Hospital 7, [3]Rentgenology, Kharkiv Medical Academy of Postgraduate Education, Kharkiv, Ukraine

Background and purpose: The ACE gene I/D polymorphism has been implicated in the development hypertension and myocardial infarction. However, the role of I/D polymorphism for patients with acute stroke is yet not understood. The aim of our study is – to clarify association ACE I/D polymorphism and different type of acute stroke.
Methods: The examination included 62 hypertensive patients with acute stroke (34 men; 28 woman; age from 44 to 80). All patients received MRI and Doppler ultrasound. All patients were genotyped for the ACE I/D polymorphism by polymerase chain reaction.
Result: Ischemic non-cardioembolic stroke (IS) – 40 patients, primary intracranial haemorrhage (IH) – 22. The frequencies of the II, ID and DD genotypes were 22.6%, 29.0% and 48.4% in all patients. In patients with IH are predominant genotypes ID – in 10 (45.6%), II – in 6 (13.2%), DD – in 6 (13.2%). But in patients with IS greatly predominant genotypes DD – in 24 (60.0%), II – in 8 (20.0%) and DD in 8 (20.0%). Patients with II genotype do not show signs of large vessel diseases. 44 (91.7%) patients with IS and ID and DD genotypes had a moderate and severe carotid artery stenosis. Patients with IS, who had D-allele of the ACE genotypes (ID or DD) are prevalent atherothrombotic stroke – in 62.5%, lacunar stroke – in 37.5%.
Conclusion: The ACE I/D polymorphism were of influence on type of acute stroke in hypertensive patients. The ACE genotype may be an additional prognostic risk factor of stroke in hypertensive patients.

P2187

Co-existence of midbrain ischemic infarct and anterior optic ischemic neuropathy

V. Lyras, S. Lyra, I. Paissios, V. Aliberti
Neurology Clinic, Red Cross Hospital, Athens, Greece

Introduction: Midbrain strokes are very rare (frequency ranges from 0.6% to 2.3% of total ischemic stroke). The strokes after general surgery are rare as well (0.008-2.9%). The frequency of postoperative (non ocular surgery) anterior optic ischemic neuropathy (AOIN) ranges from 0.002-0.2%. In this paper we present a case with simultaneous manifestation of brainstem infarct and bilateral AION.
Case report: A 61-year-old man presented to the emergency department of our clinic with complaints of dysarthria and painless visual loss gradually developed in the last twenty four hours. Medical history revealed coronary angioplasty surgery five years ago and general surgery for resection of rectal cancer with colorectal anastomosis a week prior his admission to our clinic.
The neurologic examination revealed bilateral visual loss with no light perception, pupils dilated with abolition of light reflexes, paralysis of upgaze (s.Parinaud) and severe difficulty in the horizontal gaze movement in both directions. Also a remarkable dysarthria was present. The remaining neurologic examination was unremarkable. The funduscopic examination revealed bilateral optic disk oedema with associated small nerve fibre layer haemorrhages. The brain MRI revealed a recent ischemic infarct in the middle region of the midbrain.
Conclusion: Considering the rarity of both postoperative ischemic strokes and AION, we present this case with the coexistence of midbrain stroke and AION probably of postoperative etiology, which to our knowledge has not previously been described. The possible pathophysiological mechanisms are discussed.

P2188

"Crossed ataxia" – ataxic-hemiparesis of the arm and pure ataxia of the contralateral leg: a new syndrome?

J.F. Bally, C. Granziera, P. Mégevand, D. Nguyen, T. Landis
Geneva University Hospitals, Geneva, Switzerland

We report the case of a patient presenting with clumsiness of the right arm. The clinical examination showed ataxia and paresis of the right arm and, intriguingly, ataxia without paresis of the left leg. The right leg and left arm were unaffected. Brain MRI showed a left paramedian pontine ischemic stroke. The "ataxic hemiparesis" (AH) syndrome associates paresis and ataxia of the limbs contralateral to the lesion. To our knowledge, no case of ataxic paresis of a single contralesional limb combined with isolated ataxia of a single ipsilesional limb has been reported previously. AH due to pontine lesions is thought to be caused by the involvement of both the corticospinal tract and the corticopontocerebellar pathway, respectively leading to the paretic and ataxic components of the contralateral limb. Regarding the purely ataxic component of the ipsilesional limb, we hypothesized that the axons crossing the midline from the contralateral pontine nuclei were implicated. These crossing fibres run relatively widespread on their way to the middle cerebellar peduncle and they might be somatotopically arranged; therefore, a small lesion affecting them only partially could lead to selective ataxia of a single limb. In fact, diffusion tensor imaging fibre tracking showed that only part of the corticopontocerebellar tract, namely the crossing fibres, most probably corresponding to the lower left limb, were affected by the ischemic lesion. In summary, this is a first report of crossed ataxia due to a single ischemic lesion in the brainstem.

P2189

Peculiarities of the cerebral metabolism in patients with neuropathic arthropathy and cerebral ischemia caused by internal carotid artery/middle cerebral artery (ICA/MCA) stenosis or occlusion

Z. Rozhkova[1], O. Yurik[2], A. Kholopov[2], E. Dolia[1]
[1]Radiology, Medical Clinic 'BORIS', [2]Neuroorthopedy and Pain Problems, Institute of Traumatology of the Academy of Medical Sciences of Ukraine, Kiev, Ukraine

Purpose: We study peculiarities of the brain metabolism in patients with events of neuropathic arthropathy and ICA/MCA stenosis or occlusion.
Materials and methods: Two groups of patients are examined by MRI, and 1H MRS using 1.5T SignaEXCITE (GE). The 1st group: 11 patients (6m, 5f; 31-64y) with neuropathic arthropathy and unilateral ICA/MCA high grade stenosis/occlusion. All patients have transient ischemic attacks (TIA). The 2nd group: 15 healthy subjects (10m, 5f; 23-65y). Spectra are recorded in the centrum semiovale on the affected side and the contralateral side of the brain.
Results: We introduce two indicators: metabolite content AM at the peak area and the metabolite concentration CM at the ratio of the peak area to the sum of all the peak areas S:CM=AM/S. We describe the metabolic state by the triad T*={ACho, ACr, ANAA}, where ACho, ACr, and ANAA are the peak areas of the signals from Cho, Cr and NAA. For each of the areas we assign three values:1,2,3, to obtain six symbolic spectral configurations: 1*={1,2,3}, 2*={2,1,3}, 3*={1,3,2}, 4*={3,2,1}, 5*={3,1,2}, 6*={2,3,1}. We analyzed the temporal alterations of the triad distributions after TIA. In the NG triads 1* and 2* dominate in all voxels of VOI. The most frequent configurations in the acute period after TIA are 5* and 6*. NAA/Cr, and NAA/Cho significantly decreased, Cho/Cr increased in the centrum semiovale on the affected side compared with the contralateral side and in the NG.
Conclusion: MRS is a very useful method for evaluation of the efficiency of the therapy.

P2190

Presence of coronary heart disease and cardiomyopathy as a predictor of severity and stroke outcome

D. Kuljic-Obradovic, S. Medic
Neurology, Clinical Hospital Center 'Dr Dragisa Misovic', Belgrade, Serbia

Objective: Coronary heart disease (CHD) and cardiomyopathy are established as risk factors for stroke. The objective of our study was to analyze an association between presence of these heart diseases and stroke severity as well as one month outcome.
Methods: We studied 297 patients with stroke. Patients were divided into groups according to the absence and presence of CHD or/and cardiomyopathy. The severity of stroke was assessed with NIHSS score on admission (severe stroke NIHSS >21). Four outcome measures were analyzed: mortality rate, neurological improvement assessed with NIHSS score, functional outcome (unfavourable outcome Barthel Index <70) and disability (severe disabled modified Rankin Scale >3).
Results: Among stroke patients 38% had CHD, 25% had cardiomyopathy and 11% had CHD with cardiomyopathy. There was no significant correlation between presence of CHD and severity of stroke and mortality. Patients with cardiomyopathy were at significantly greater risk for developing severe stroke (29.7% vs. 14%) and death (37.8% vs. 13.5%). Among survivors there was no significant correlation between presence or absence of CHD and cardiomyopathy and neurological improvement (25.3% vs. 23% vs. 26.8%), unfavourable functional outcome (33.6% vs. 35% vs. 32.1%) and severe residual disability (55% vs. 58.1% vs. 49.6%).
Conclusions: Stroke patients with cardiomyopathy were at significantly greater risk for developing severe stroke ($p<0.05$) and had increased mortality ($p<0.01$). There was no significant correlation between presence of CHD and severity of stroke and mortality, and between presence of CHD and cardiomyopathy as well as one month outcome.

P2191

Abstract cancelled

P2192

Antiphospholipid antibodies and cerebrovascular accidents in patients under 50 years

Z. Adwan
Neurology, SMS HOSP, Swaida, Syria

Background: Antiphospholipid antibodies (APAs) are one of the important risk factors for cerebrovascular accidents (CVA). The aim of the present study was to assess the relationship between APA titres and CVA in this clinically important age group.
Methods: This case-control study was carried out from Dec 2007 until March 2009 in patients under 50 years who had CVA (stroke or transient ischemic attack). In this study, 61 patients with CVA were compared with 68 age- and gender-matched control subjects. Lupus anticoagulant assay results and APA titres were assessed in both groups.
Results: The mean value of IgM APA titres in patients with cerebrovascular accidents was 6.492 MPL (IgM antiphospholipid units) and 1.846 MPL in the control group. The difference between the two groups was significant (p-value: 0.000). In 12 (20%) of the patients with cerebrovascular accidents, IgM titres were higher than 10 MPL, one of whom had an IgM titre higher than 40 MPL. The mean value of IgG titres in the case group was 5.50 GPL (IgG antiphospholipid units) and 3.51 GPL in the control group. The difference between the two groups was significant (p-value: 0.012). 13 (21%) patients with cerebrovascular accidents had IgG titres higher than 10 GPL. The difference between the LA assay results was not significant between the two groups (p-value: 0.311).
Conclusion: The present study showed a positive relationship between APL (IgM and IgG) titres and CVA in patients under 50 years old.

P2193

Phospholipid content of rat brain mitochondria and synaptosomes following experimental hypoxia

E. Petrova, A. Dishkelov, E. Vasileva
Institute of Experimental Morphology and Anthropology with Museum, Department of Experimental Morphology, Bulgarian Academy of Sciences, Sofia, Bulgaria

Aim: The aim of the present investigation was to establish the changes of the level of total and individual phospholipids in brain mitochondria and synaptosomes following experimental hypoxia.
Methods: 20 male Wistar rats at the age of three months were subjected to sodium nitrite-induced cerebral hypoxia (20mg/kg body weight, 2ml/kg dosing volume, intravenously). Brain mitochondria and synaptosomes were isolated and lipids were extracted. The phospholipid content was measured by thin-layer chromatography and spectrophotometrically.
Results: In controls, phosphatidylcholine and phosphatidylethanolamine were the main phospholipid components and together they accounted for 71.6% and 73.7% of total phospholipids in synaptosomes and mitochondria, respectively. In the hypoxic brains the total phospholipids increased by 83% in synaptosomes and by 2% in mitochondria. The different phospholipid classes were not equally affected. The two subcellular fractions showed higher content of lysophospholipids, phosphatidylinositol, phosphatidylserine and phosphatidylcholine and lower concentration of phosphatidic acid. Nevertheless, phosphatidylcholine and phosphatidylethanolamine were the major components after hypoxia.
Conclusion: Our data reveal that sodium nitrite-induced hypoxia provokes various changes of the phospholipid levels in brain mitochondria and synaptosomes. Probably these metabolically active subcellular structures recover quickly after hypoxia and this explains the increase of total phospholipids. The inhomogeneous changes of the various phospholipid classes may be influenced by differences in their turnover and in the accessibility of phospholipases to phospholipids.

P2194

Local administration of medicinal plants in treating cardiovascular disease: results from a cross-sectional study in Barisal city of Bangladesh

M.A.H. Mollik[1,2], K. Akter[1], M.T. Islam[2], B. Ahmmed[3], D. Sen[4], A. Chowdhury[4]
[1]Epidemiology, Biostatistics, Community Nutrition and Noncommunicable Diseases, Peoples Integrated Alliance, [2]Health and Nutrition, Biogene Life Care, [3]Biomedical Engineering, Al-Helal Specialized Hospital Limited, [4]Health Technology [Laboratory], State College of Health Sciences, Dhaka, Bangladesh

Today a person is very much preoccupied. Modern lifestyle has contributed to serious increase in killer diseases like cardiovascular disease (CVD). Currently, most medications or therapies for treatment of CVD have serious side-effects, which sometimes can be more life-threatening than the disease itself. It is important, therefore, to turn to medicinal plant sources for discovery of novel yet safe compounds, which have less or no side-effects to treat CVD. We accordingly conducted an ethnopharmacological survey of several areas within Barisal city of Bangladesh to learn more about medicinal plants used by the traditional health practitioners to treat CVD. Interviews were conducted with the help of a semi-structured questionnaire and medicinal plant specimens as pointed by the traditional health practitioners were collected and identified at the Bangladesh National Herbarium. The medicinal plants obtained in this ethnopharmacological survey included Sorghum vulgare, Prunus communis, Olea europaea, Nigella sativa, Withania somnifera, Maranta arundinacea, Sterculia foetida, Ocimum tenuiflorum, Ficus racemosa, Cinnamomum verum, Punica granatum, Aegle marmelos, Coccinia cordifolia, Carica papaya, Vitis vinifera, Hemidesmus indicus, Bacopa monnieri, Terminalia arjuna, Psidium guajava, Swertia chirata, Abrus precatorius, Strychnos nux-vomica, Aloe barbadensis, Cocos nucifera, Allium sativum, Saccharum officinarum, Rosa damascena, Morus alba, Citrullus vulgaris, Zea mays, Cicer arietinum, Arachis hypogaea, and Euphorbia thymifolia. Since the city patients appeared to be generally satisfied with the treatment offered through these medicinal plants, it is important to conduct proper scientific studies towards discovery of compounds of interest in these medicinal plants, which can be used as safe and effective medicines for CVD.

P2195

Endoscopic transventricular removal of spontaneous haemorrhage in thalamus

J. Kuzibayev
Neurosurgery, Republican Research Center of Emergency Medicine, Tashkent, Uzbekistan

The main purpose of surgical treatment of spontaneous intracerebral haemorrhage is a minimal invasive removal of haemorrhage with maximal volume evacuation. For the purpose of decreasing damage to the brain we developed endoscopic transventricular removal of spontaneous haemorrhage in thalamus and analyzed the results of treatment of patients with haemorrhage in thalamus using this technique.

We performed endoscopic transventricular removal of the haemorrhage in 21 patients with spontaneous haemorrhage in thalamus during 48 hours after onset of stroke. The range of hematoma volume was 15-32cm^3, the mean hematoma volume 22.5±3.8cm^3. Through burr hole the rigid endoscope of Aesculap AG was introduced through anterior or posterior horns of lateral ventricle to get to the thalamus. In case of intraventricular haemorrhage forced irrigation with solution through channels of the endoscope improved visualization. The hematoma in thalamus was aspirated after puncture of the thalamus across lateral ventricle using drain entered through the working channel of the endoscope.

The mean duration time of surgery was 68.8±6.5 minutes, the mean hematoma removal rate was 88.6±6.4%. The mortality rate was 14.2%. No post-operative recurrence of haemorrhage and pyoinflammatory complication occurred.

The main advantages of endoscopic transventricular removal of haemorrhage in thalamus are:

1) Burr hole minimal invasive approach using local anaesthesia.
2) Bypass the damage of internal capsule
3) The capability of manipulation in deep area of the brain through narrow surgical approach.

We consider that removal of spontaneous intracerebral haemorrhage in thalamus through transventricular passway using endoscopic technique allows improving the treatment outcome in patients.

P2196

Clinical and laboratory manifestations of nodular infarction

I.S. Moon[1], Y.B. Lim[2], J.H. Bae[1]
[1]Neurology, Daedong Hospital, [2]Neurology, Bong Saeng Hospital, Busan, Republic of Korea

Isolated nodular infarction has rarely been described. We report clinical and laboratory findings of 8 patients with isolated nodular infarction, 6 with unilateral and 2 with bilateral lesions. All the patients presented with isolated vertigo. The most common manifestation was unilateral nystagmus and falling in the opposite direction, which mimicked peripheral vestibulopathy. The direction of the spontaneous nystagmus was always ipsilesional in the unilateral lesion. However, head impulse and bithermal caloric tests were normal. The imbalance was moderate to severe. Other findings include periodic alternating nystagmus, perverted head shaking nystagmus, paroxysmal positional nystagmus, and impaired tilt suppression of the post-rotatory nystagmus. MR angiography showed ipsilesional vertebral artery hypoplasia in 3 patients, and small vessel disease was the most common mechanism. The prognosis was excellent. Isolated nodular infarction mostly presents with isolated vertigo mimicking acute peripheral vestibulopathy. The findings of isolated nodular infarctions are consistent with impaired gravito-inertial processing of the vestibular signals and disrupted nodular inhibition on the vestibular secondary neurons and the velocity storage mechanism.

P2197

Leptin – an important link between cerebrovascular diseases and metabolic syndrome

M.A. Pyzik
Medical University, Lodz, Poland

Background: Leptin, an important hormone for body weight regulation – primary involved in the regulation of food intake and energy expenditure – may be involved in the pathogenesis of cerebrovascular manifestations of obesity.
Methods: To this study patients with early ischemic stroke and referents without cerebrovascular diseases, matched with age and gender were qualified. We examined lipid pattern, blood glucose level, blood pressure, body mass index and central fat – measured by waist circumference (WC) and waist to hip ratio (W/H) – in every patient. Plasma leptin level was measured by an enzyme linked immunosorbent assay. On the basis of these parameters we diagnosed the presence of a metabolic syndrome, defined according to International Diabetes Foundation. Ultrasonographic scanning of the carotid artery was performed in each patient to evaluate the IMT (intima-media thickness).
Results: Up to this time we have examined 73 participants with stroke and 29 without vascular diseases. Metabolic syndrome was diagnosed in 44% of stroke cases. It was significantly more than in the non-stroke patients group. Leptin concentrations were higher in the stroke group: 26.45ng/ml vs. 14.65ng/ml ($p<0.05$). Hyperleptinemia was more often present in patients with diagnosed metabolic syndrome ($p<0.001$) and in subjects with markers of abdominal obesity ($p<0.001$). The presence of IMT (an early marker of asymptomatic atherosclerosis) was more often observed in the stroke group ($p<0.01$). Hyperleptinemia was associated with presence of IMT.
Conclusion: Adipose tissue (or leptin per se) may have an influence on the development of cerebrovascular disease in obese people.

P2198

Intravenous tissue – type plasminogen activator therapy for ischemic stroke: the Nis stroke team experience November 2006 – March 2010

M. Zivkovic, N. Vukasinovic, S. Jolic, G. Djordjevic, S. Ristic
Department of Neurology, University Clinical Center Nis, Nis, Serbia

Background: To present the preliminary experience of implementing intravenous thrombolytic therapy for acute ischaemic stroke in stroke unit, Department of neurology, Clinical centre Nis, South Serbia.
Methods: This prospective and observational study included 100 consecutive patients with an ischaemic stroke treated in our stroke unit within 3-6 hours from the onset of symptoms, between November 2006 and March 2010. Patients were selected and treated in accordance with the American Heart Association guidelines. Primary safety and outcome variables were performed on MRI at 24-36 hours, mortality and independence at 90 days.
Results: 100 patients (52 men and 48 women) with a median age of 69 years±13.2 years (range 24-79) received thrombolytic treatment (approximately 3.4% of 910 patients with ischemic stroke). The median time from stroke onset to rt-PA therapy was 110 minutes (range 20-180) and from arrival in the emergency room to the start of thrombolysis 80 minutes. Baseline median NIHSS was 16 (range 4-44). 60 patients exhibited early clinical improvement, defined as a decrease in NIHSS score. Median NIHSS before discharge was 4.2 points. At 3 months, 80% (95% Ci, 47.9-64.1) of patients were functionally independent. Three patients developed a haemorrhage. 16.8% patients died within 3 months of stroke.
Conclusions: The use of intravenous t-PA by experienced neurologists in stroke unites, is safe and it is associated with a favourable outcome, without excess risk, similar to that observed in clinical trials. Successful experience with this therapy depends on organization of the treating team and adherence to published guidelines.

P2199

Autophagy of human vascular endothelial cells by oxidized LDL: involvement of oxidative stress but not LOX-1

Y.-L. Zhang[1], Y. Cao[1,2], S.-J. You[1], R.-X. Li[1], Y.-P. Yang[1,2], X. Zhang[1], G.-D. Xiao[1], C.-F. Liu[1,2]
[1]Department of Neurology, Second Affiliated Hospital of Soochow University, [2]Institute of Neuroscience, Soochow University, Suzhou, China

Background: Effect of oxidative LDL (ox-LDL) on the level of autophagy in human vascular endothelial cells (HUVECs) is still unknown. Oxidative stress is a well-known stimulus of autophagy to facilitate the removal of damaged organelles. Autophagy in EA.hy926 endothelial cells exposed ox-LDL is associated with oxidative stress. In Human Granulosa Cells, ox-LDL-induced autophagic cell death is mediated by lectin-like oxidized low density lipoprotein-1 (LOX-1).
Methods: After ox-LDL exposure, the activation of autophagy in HUVECs were measured by calculating their ratio of LC3-II/LC3-I, Beclin1 protein levels and autophagic vacuolars. The roles of oxidative stress and LOX-1 in this activation of autophagy were investigated by using vitC, vitE and LOX-1mAb interference.
Results: Ox-LDL treatment (100μg/ml, 6, 12, 24h) brought about an increase in the formation of autophagosomes. Ox-LDL (100μg/ml, 0.5, 1.5, 3, 6, 12, 24, 48h) upregulated the ratio of LC3-II/LC3-I and the beclin1, lamp2a protein levels, which peaked at 0.5h and 6h point. Ox-LDL (50, 100, 150, 200μg/ml, 6h) treatment increased the ratio of LC3-II/LC3-I and beclin1 protein level in a concentration-dependent way. This up-regulation in the ratio of LC3-II/LC3-I was reversed by vitC and vitE pre-treatment, but not LOX-1mAb. LOX-1mAb decreased the increases of lamp2a induced by ox-LDL, while, vitC and vitE only inhibited the increases of lamp2a at 6h point, but not at 0.5h point.
Conclusion: Autophagy can be activated by ox-LDL treatment in HUVECs. Oxidative stress, but not LOX-1 plays an important role in this activation.

P2200

Gender differences in hospitalized patients with acute ischemic stroke: risk factors, clinical features, natural history and prognosis

S. Jevdjic[1], S. Djokic[1], V. Soskic[2]
[1]Neurology, Opsta Bolnica Pancevo, Pancevo, [2]Neurology, Dom Zdravlja Palilula, Beograd, Serbia

Objective: Females with acute ischemic stroke have a more severe disease and worse functional outcome.
Methods: Among patients who were hospitalized in our department in the previous year, 127 (64 females) had complete records. Baseline characteristics, risk factors, CT patterns and clinical outcome were compared.
Results: Deceased patients (25%) were 6 years older (70 and 76 years). Males were more often smokers ($p<0.005$) and alcoholics ($p<0.025$). Hypertension was present in 83%, but females took medications more regularly ($p<0.01$), and had longer duration of the disease ($p<0.025$). Diabetes mellitus was more often in females, ($p<0.025$). Heart diseases were present in 58%, and atrial fibrillation was found more often in the deceased of both groups ($p<0.05$). Females had previous stroke more often ($p<0.025$), and hypertension in family history ($p< 0.01$). Nausea, vomiting and changed consciousness were more often in deceased women ($p<0.05$ and $p<0.005$).There was a difference in LDH and CK levels between sexes in the deceased group ($p<0.025$). Male patients with acute lacunar lesions on CT scan were more likely to survive ($p<0.025$).
Conclusion: Females with acute ischemic stroke take medications regularly for longer lasting hypertension, have diabetes and previous stroke, as well as positive family history for hypertension. Nausea and vomiting and changed consciousness are signs of worse prognosis for them. Males are more likely smokers, alcoholics, have ischemic heart decease, elevated levels of cardiac enzymes during acute stage of stroke, and lacunar stroke on CT implicated favourable outcome.

P2201

Inflammatory status evaluation by serum Hs-CRP in patients with carotid stenosis

C. Revnic[1], C. Ginghina[2], I. Popescu[3], C. Popa[3], F. Revnic[4]
[1]UMF Carol Davila, [2]C.C.Iliescu Cardiovascular Disease Institute, [3]IBCV Vlad Voiculescu, [4]NIGG Ana Aslan, Bucharest, Romania

Background: Inflammation is present in all stages of atherosclerosis and Hs-CRP is an important predictor for stroke and cardiovascular events in patients with atherosclerosis.
Objectives: The aim was to evaluate the relationship between serum Hs-CRP levels and stroke in patients with carotid stenosis.
Material and methods: The study has been done on 80 patients (64 men) (30 controls without carotid atherosclerosis, 24 patients with asymptomatic carotid stenosis and 26 patients with symptomatic carotid stenosis) mean age 58.3±9.8 years; range 25 to 86 years. All patients underwent echo Doppler carotid ultrasound examination using an SSD-5500 (Aloka Co. Ltd) scanner equipped with a 7.5-MHz imaging probe. Blood samples from all patients were collected, after centrifugation for 10 minutes at 3000rpm serum was separated from clot and frozen at -70° until the determination was made. Serum Hs-CRP levels were determined in all patients using a Dade Behring hsCRP assay by ELISA method.
Results: The mean values of Hs-CRP in control patients were 1.38mg/ml±0.63 (p=0.15), 1.78±0.84mg.ml in patients with asymptomatic carotid stenosis (p=0.04) and 1.82±0.92 mg/ml in patients with symptomatic carotid stenosis (p=0.08). Among the 80 patients studied 32 had a stroke (19 from the symptomatic carotid stenosis group (73%) and 13 from the asymptomatic carotid stenosis group (54%). Associated risk factors for stroke were studied, among them diabetes (45%), high blood pressure (65%), hipercolesterolemia (50%) and smoking (25%).
Conclusion: Elevated levels of hs-CRP were associated with morphological and clinical progression of the carotid atherosclerotic disease, patients with high levels of hs-CRP having an increased risk for stroke and cardiovascular events.

P2202

Correlation between ultrasonographic and computerised tomography or magnetic resonance angiography findings in vertebrobasilar arteries in patients with high-grade basilar artery stenosis

T.S. Jaramaz Ducic, M. Vukicevic, N. Ivanovic, S. Djokovic, T. Stricevic, B. Georgievski Brkic, M. Savic
[1]Special Hospital for Cerebrovascular Diseases 'Sveti Sava', Belgrade, Serbia

Introduction: Reduced blood flow in extracranial segment of vertebral artery indicates hemodynamically significant stenosis or occlusion of intracranial segment of vertebrobasilar arteries in the majority of cases.
Aim: To evaluate correlation between ultrasonographically determined (extracranial and transcranial Doppler sonography, EDS and TCD, respectively) hemodynamic disturbances in vertebrobasilar arteries and computerised tomography (CT) or magnetic resonance (MR) angiography findings.
Material and methods: Retrospective study including 20 patients (17 males and 3 females, mean age 64.5 years), treated due to transitory ischaemic attack or ischaemic stroke in vertebrobasilar circulation at our hospital during 2009. Reduced blood flow and increased resistance index (IR) without stenotic lesions in extracranial segment of vertebral artery (VA) were registered with EDS. Additionally, TCD, CT or MR angiography were performed in all the patients during same hospitalisation.
Results: In all patients EDS showed reduced blood flow in VA with increased IR, which was unilateral in 13 (65%) and bilateral in 7 (35%) patients. TCD registered high degree basilar artery stenosis (15pts, 75%), reduced VA and BA blood flow with increased IR (2pts, 10%), and only BA blood flow reduction (3pts, 15%). CT or MR angiography showed high degree BA stenosis in all patients.
Conclusion: Reduced blood flow in the extracranial segment of VA diagnosed by ESD highly indicates presence of intracranial occlusive disease and suggests further diagnostic evaluation by TCD and CT or MRI angiography.

P2203

An audit of thrombolysis suitability in a Northern Ireland district general hospital

E. Devenney, T. Esmonde
Neurology, Royal Victoria Hospital, Belfast, UK

Introduction: Stroke is a devastating disease resulting in major burden for patients, carers and the health service. With the advent of thrombolysis there is now the potential to reduce the extent of cerebral ischaemia and improve outcome following stroke.
Aim: To identify patients attending the A&E department with stroke in a district general hospital and examine the proportion of these patients who would have been suitable for thrombolysis.
Method: Data were collected retrospectively for a 10-month period by retrieving the charts of patients coded as stroke. Suitability for thrombolysis was documented in accordance with SITS criteria.
Results: 209 charts were retrieved and reviewed. 58% of patients had a confirmed ischaemic stroke. 9.9% of these patients were suitable for thrombolysis. This was increased to 12.4% of patients when the time window was increased to 4.5 hours. 25% of these patients presented out of normal working hours. The majority were unsuitable based on timing.
Conclusion: The implementation of a thrombolysis service has implications for service provision. Given the small proportion of patients suitable for thrombolysis, it is important to consider if clinician experience would be adequate in this setting or if communication with a regional centre would provide a better level of care. Ongoing efforts to raise public awareness of the importance of early treatment for stroke will likely increase the numbers of suitable patients.

P2204

Abstract cancelled

P2205

Modified Rankin scale according to the location of small subcortical infarction in the centrum semiovale

Y.H. Yun, J.H. Park, S.A. Park, T.K. Lee, K.B. Sung
Neurology, Soonchunhyang University, Bucheon, Republic of Korea

Objectives: A somatotopic organization of motor fibres in the centrum semiovale has been reported. However, there have been no studies about the relation between the recovery of gait and the location of the centrum semiovale infarction. Therefore, we compared the modified Rankin scale (mRS) measured 30 days after stroke onset.
Materials and methods: 41 patients with acute cerebral infarction in the centrum semiovale were included. All patients underwent brain MRI including T2-weighted image and diffusion-weighted image within 7 days after symptom onset. We measured mRS as an index of the recovery of gait 30 days after stroke onset. After classifying the patients into four groups:
1) Group I: anteromedial group,
2) Group II: anterolateral group,
3) Group III: posteromedial group,
4) Group IV: posterolateral group;
we compared mRS among four groups.
Results: Analysis of 41 patients indicated: 16 patients (39%) of group I, 12 (29%) of group II, 10 (24%) of group III, and 3 (7%) of group IV. Group III had higher mRS score than those of the remaining groups (p=0.016, 0.002, 0.032 in group I, II, IV)
Conclusion: Our data suggested that posteromedially located lesion in the centrum semiovale has less favourable outcome by mRS. By demonstrating motor fibres to the lower extremity descend more posteriorly and medially in regard to the lateral ventricle, we also purposed that the lesion location is closely related to mRS and has prognostic value of the activity of daily life in the centrum semiovale.

P2206

Correlation of unilateral sub-occlusion of the internal carotid artery – clinical features and computed tomography findings

T. Jaramaz Ducic, M. Vukicevic, N. Ivanovic, S. Djokovic, T. Stricevic, B. Georgievski Brkic, M. Savic
Special Hospital for Cerebrovascular Diseases 'Sveti Sava', Belgrade, Serbia

Introduction: Sub-occlusion of blood vessel (80-99%) has a wide clinical spectrum range from asymptomatic to the clinical picture of severe neurological deficit.
Objective: To determine the relationship between the ultrasound diagnosed unilateral sub-occlusion of extracranial segment of internal carotid artery (ICA), brain computed tomography (MSCT) and clinical presentation.
Material and method: Retrospective study included 67 patients with unilateral ICA sub-occlusion hospitalized in our institution from June 2007 to June 2008. All patients were scored using stroke scale of the American National Institute for of Health (NIHHS) on admission and at discharge; all of them had endocranial MSCT and carotid duplex ultrasonography. The data were processed using appropriate statistical methods (methods of descriptive statistics, X^2 test).
Results: The study included 67 patients (44 men and 23 women), with mean age of 65 years and average NIHHS at admission to the hospital of 5.7 (0-20) and 4.9 (0-19) at discharge from the hospital. Patients presented following risk factors: hypertension (86%), diabetes mellitus (29%), hyperlipidemia (13%) and smoking (31%). MSCT showed neat findings in 9, lacunar strokes in 39, mid strokes in 13 and large strokes in 6 patients. High statistically significant difference ($X^2e=40.35$, $X^20.05=9.48$, $X^20.01=13.277$, DF=3) ($p<0.01$) was found in patients with lacunar stroke.
Conclusion: Unilateral symptomatic sub-occlusion of ICA often occurs in male patients suffering from arterial hypertension, manifested with minor neurological deficit, and most frequent findings on MSCT are lacunar strokes.

P2207

Cerebral vasospasm resulting in hemispheric stroke after brain tumour resection

A. Chalissery[1], G. O'Connor[2], J. Thornton[3], D. Rawluk[4], J.T. Moroney[1]
[1]Neurology, Beaumont Hospital/Royal College of Surgeons in Ireland, [2]Neurology, [3]Radiology, [4]Neurosurgery, Beaumont Hospital, Dublin, Ireland

Background: While cerebral vasospasm is a recognised complication of subarachnoid haemorrhage, it is uncommon after brain tumour resection.
Methods: We report two cases of diffuse cerebral vasospasm following tumour resection resulting in large hemispheric strokes.
Results: A 30-year-old man experienced a non-dominant hemispheral stroke 14 days after acoustic neuroma resection. Repeated CT on day 20 showed a right middle cerebral artery territory (MCA) infarct. Angiography performed at day 23 showed diffuse vasospasm most marked in bilateral MCAs. Nimodipine and fluids were started. Follow-up angiography was normal. Despite prolonged neurorehabilitation he had significant post-stroke disability. A 50-year-old woman developed a left-sided hemiparesis at day 18 after meningioma resection. MRI and MRA brain on day 19 showed bihemispheric infarcts with severe vasospasm. She was treated promptly with fluids, pressors and Nimodipine. Subsequent MRA was normal and she improved significantly with neurorehabilitation.
Conclusion: Early recognition of cerebral vasospasm as the underlying mechanism for delayed neurological deficit after tumour resection facilitates early specific treatment, which may improve outcome. Although blood in the subarachnoid space has been implicated as the most probable initiating event, the aetiology for vasospasm post tumour resection is unknown. Tumour location and surgical approach may contribute to the development of the vasospasm.

P2208

Secondary prevention with atorvastatin after recent stroke in an aging Mediterranean population without known coronary heart disease

A. Sicras-Mainar[1], A. Planas-Comes[2], X. Frias-Garrido[3], R. Navarro-Artieda[4], M. De Salas-Cansado[5], J. Rejas-Gutiérrez[5]

[1]Directorate of Planning, Badalona Serveis Assistencials (BSA), Badalona, [2]Department of Neurology, Badalona Serveis Assistencials SA, Badalona, [3]Primary Healthcare Unit, Badalona Serveis Assistencials SA, Badalona, [4]Department of Medical Information and Documentation, Hospital Germans Trias i Pujol, Badalona, Barcelona, [5]Health Outcomes Research Department, Medical Unit, Pfizer Spain, Alcobendas, Madrid, Spain

Objective: To determine whether atorvastatin therapy after a first stroke episode reduces the incidence of recurrent stroke and all-causes mortality in a Mediterranean population without known coronary heart disease.

Methods: A retrospective study was carried out using records on death, hospitalizations due to stroke and history of atorvastatin therapy included in the BSA database. A cohort of consecutive patients with a first-ever acute stroke episode covered by the BSA health provider plan was formed from January 2003 until December 2008 for whom there was information available covering the 6-year follow-up period. Recurrence rate (RR) and incidence rate (IR) of stroke and all-causes mortality was computed. Association with atorvastatin was assessed by means of calculation of relative risk (RR) and hazard ratio (HR) using multivariate logistic regression and Cox proportional hazards models controlling for confounding covariates.

Results: The cohort comprised a series of 511 consecutive patients [57% men, 76.2 (12.6) years old (86% >60 years)], 20% receiving atorvastatin (65% >20mg/day), which was associated with lower RR; 10% versus 18% [adjusted RR= 0.46 (CI: 0.21-0.99), p=0.047], and lower IR; 23.10 versus 45.22 events/year-1000 subjects [adjusted HR=0.49 (0.24-0.99), p=0.049]. Similarly, crude all-causes mortality was lower in the cohort receiving atorvastatin; 10% versus 16% [adjusted RR= 0.73 (CI: 0.33-1.63), p=0.442], and also mortality rate; 22.50 versus 36.25 deaths/year-1000 subjects [adjusted HR=0.21 (0.05-0.98), p=0.047].

Conclusions: Secondary prevention with atorvastatin in patients with first-ever stroke lowers the risk of 6-year stroke recurrence and improves survival in an aging Mediterranean cohort.

P2209

Hemispheric watershed infarcts: clinical features, aetiologies and prognosis of 40 consecutive cases

C. Join-Lambert[1], R. Souillard[2], C. Rouvière[1], D. Ducreux[2], D. Adams[1], C. Denier[1]

[1]Neurology, [2]Neuroradiology, Paris Sud, Kremlin-Bicêtre, France

Watershed infarcts are defined by their location in junction between two arterial territories. Rare large series have been published, but they were essentially retrospective or/and based on CT imaging. We consecutively included patients with MRI-assessed cerebral infarctions among individuals admitted to our stroke unit during a 26-month period. Cases of hemispheric WI were prospectively identified to analyse their clinical features, aetiologies, and prognosis. 40 patients among 490 with MRI-confirmed cerebral infarct presented a hemispheric watershed cortical infarct (8.8%). Peculiar clinical characteristic have to be noted: previous transient ischemic event in 23% (n=9), aphasia initially transcortical mixt in 28% (n=11), and early seizures more frequent in these borderzone infarcts than in other cortical hemispheric strokes ($p<0.05$). Concerning aetiologies, there was a homolateral carotid stenosis in 67% of patients (n=26). Global prognosis was very good for 87% of patients (Rankin score ≤ 2 at 3 months) (n=34). The watershed cortical hemispheric infarcts are frequent. The presence of transcortical mixed aphasia at first examination, the happening of transient ischemic event and/or early seizures following stroke appear to be more often in these borderzone infarctions than in other infarcts. Outcome of watershed infarcts in NICU appear to be excellent, with functional scores compatible with a normal life at 3 months. Assessing the cause is an emergency, because of the frequently associated sub-occlusions and/or tight carotid stenosis. This shows the matter of caring all strokes in NICU and the interest of a first imaging by MRI.

P2210

Prognostic value of urinary incontinence in stroke patients

M. Rotar[1], R. Blagus[2], M. Jeromel[3], M. Skrbec[3], J. Stare[2], B. Trsinar[4], D.B. Vodusek[1]
[1]Institute of Clinical Neurophysiology, University Medical Centre Ljubljana, [2]Institute for Biostatistics and Medical Informatics, Faculty of Medicine, University of Ljubljana, [3]Institute of Radiology, [4]Department of Urology, University Medical Centre Ljubljana, Ljubljana, Slovenia

Introduction: Urinary incontinence (UI) is a predictor of greater mortality and poor functional recovery; however published studies failed to evaluate LUT function immediately after stroke. The aim of our study was to evaluate the course of LUT function in the first week after stroke, and its impact on prognosis.

Patients and methods: We included 100 consecutively admitted patients suffering first-ever stroke and evaluated them within 72 hours after stroke, after 7 days, 6 months, and 12 months. For LUT function assessment we used ultrasound measurement. The patients were divided into three groups: (i) patients who remained continent after stroke, (ii) patients who had LUT dysfunction in the acute phase but regained continence in the first week, and (iii) patients who did not regain normal LUT control in the first week. We assessed the influence of variables on death using the multiple logistic regression model.

Results: Immediately after stroke, 58 patients had LUT dysfunction. The odds of dying in the group with LUT dysfunction were significantly larger than odds in the group without LUT dysfunction. Odds for death for patients who regained LUT function within 1 week after stroke were comparable to patients without LUT dysfunction.

Conclusions: We confirmed that post-stroke UI is a predictor of greater mortality at 1 week, 6 months and 12 months after stroke. However, patients who regain normal bladder control in the first week have a prognosis comparable with patients who do not have micturition disturbances following stroke.

P2211

Chronic brainstem ischemia in subclavian steal syndrome

L.P. Kee, B. Chuah, A.K. Sinha, P.A. Robless, V.K. Sharma
National University Health System, National University of Singapore, Singapore, Singapore

Background: Subclavian steal syndrome (SSS) is usually asymptomatic & more frequent on the left-side. Severe SSS may cause vertebro-basilar (VB) ischemia in some cases.

Methods: From July 2008 to June 2009, 1208 patients underwent cerebrovascular ultrasonography in our neurovascular laboratory. 23 (1.9%) patients with SSS were evaluated with hyperemia-ischemia cuff (HIC) test during transcranial Doppler (TCD) monitoring. We looked for neurological symptoms during HIC test. Flow alterations in VB arteries occurred in 5/23 cases but only one developed transient dizziness during the test.

Results: A 58-year-old man, without any vascular risk factors, presented with gradually progressive slowing in walking and talking for 6 months. He spoke slowly, without any dysarthria. Muscle tone and power in extremities were normal. There were no features suggestive of parkinsonism, spasticity or cerebellar dysfunction. Right radial pulse was feeble and significantly different from the left with marked blood-pressure (BP) difference. Cervical duplex revealed severe stenosis in right subclavian artery with retrograde flow in the right VA. TCD monitoring of BA and posterior cerebral arteries during HIC test showed significant decrease in flow velocities immediately after release of BP cuff, accompanied by transient dizziness. Suspecting chronic brainstem ischemia responsible for his progressive slowing, he was advised to undergo surgical revascularization. Normal VB flow and no steal phenomenon on HIC test was seen after 3 weeks of surgery. Marked improvement was seen in gait and speech. Single photon emission computed tomography showed considerable improvement after surgery.

Conclusion: SSS can cause chronic brainstem ischemia and present with atypical features. Careful diagnostic evaluation helps in selecting patients suitable for revascularization procedures.

P2212

The relationship between obesity and carotid intima-media thickness in healthy women

S. Guldiken[1], N. Tunçbilek[2], B. Ekiz Bilir[1], E. Unlu[2]
[1]Internal Medicine, Division of Endocrinology, [2]Radiology, Trakya University, Medical Faculty, Edirne, Turkey

Aim: Carotid intima-media thickness (C-IMT) is an important risk factor for stroke and cardiovascular disease. The purpose of this study was to assess the contribution of obesity to C-IMT in women, by using ultrasonography (USG).
Material and methods: The study population consisted of 78 women (age range: 39-78 years; mean age: 53.4 years). The C-IMT was measured by high resolution B-mode USG. The body mass index (BMI), the waist/hip ratio (WHR) and the waist circumference (WC) was recorded. Total fat mass was measured by TANITA. The statistical analysis between the C-IMT values and anthropometric measurements was done by Pearson correlation tests and the independent T-test.
Results: The mean BMI, total fat mass and WC of non-obese group (n=15) were 23.3kg/m^2, 15.6kg, 83.5cm, respectively. The mean BMI, total fat mass and WC of non-obese group (n=63) were 30.7kg/m^2, 29.3kg, 94.6cm, respectively. The mean value of C-IMT (0.783 mm, 0.641mm, $p<0.05$) was higher in the obese group when compared to the non-obese group. Significant associations were found between C-IMT values and anthropometric measurements such as BMI, WC, and total fat mass in the obese group ($p<0.05$, $p<0.05$, $p<0.05$, respectively).
Discussion: This study suggests that obesity is a risk factor for carotid intima-media thickness and future stroke events.

P2213

Clinical characteristics of stroke in patients with diabetes mellitus

I. Macavei[1], I. Huza[2], D. Ionasiu[1], A. Macavei[3], I. Macavei[3], D. Podeanu[4]
[1]Neurology, University of Medicine and Pharmacy, Clinical County and Emergency, [2]University of Medicine and Pharmacy, [3]Clinical County and Emergency Hospital Mures, [4]Department of Radiology, Clinical County and Emergency Hospital Mures, Târgu-Mures, Romania

Objectives: In this study, we followed to assess the effects of association between stroke and diabetes mellitus, risk factors as well as clinical and imaging issues, in order to develop prevention strategies.
Methods: Diabetes was diagnosed in 216 (19.33%) of 1117 patients with cerebral infarction admitted to the Department of Neurology from 1 January – 31 December 2008. Demographic characteristics, cardiovascular risk factors, clinical events, stroke subtypes, neuroimaging data and outcome in stroke patients with diabetes were followed.
Results: Diabetes was identified in 216 (19.33%) of the 1117 stroke patients. Patient age ranged from 41-90 years, average age being 68.66 years. Women had a higher frequency of diabetes mellitus (53.70%) than men (46.3%). Of the total of 216 cases, 196 were ischemic stroke (90.74%), compared with hemorrhagic stroke (9.26%). Cardiovascular risk factors included hypertension 98% of cases, atrial fibrillation 21.75%, hyperlipidemia in 58.33%, ischemic heart disease 58%, chronic nephropathy in 8.79%, and myocardial infarction sequels 4.69%. We have noted that in 39.44% of patients more than one risk factor is associated. The frequency of stroke subtypes was as follows: atherothrombotic infarction in 41.2% of patients, lacunar infarction in 31%, presumed cardioembolic stroke in 25%, other causes 2.8%. A total of 76 patients(38.18%) had stenotic lesions or occlusion in carotid system and/or vertebro-basilary system. Average days of hospitalization was 11.07 days/patient.
Conclusions: Diabetes is a major risk factor for stroke and is associated with an increase in overall stroke mortality. The etiology of stroke in diabetics frequently is microvascular disease. Diabetics also have an increased incidence of large vessel disease. Careful management of other associated risk factors, particularly hypercholesterolemia and hypertension, are imperative for the prevention of stroke in diabetic patients.

P2214

Benign cerebral angiitis or angiopathies mimicking syndromic-radiological vasculitis

P. Cardona[1], A. Escrig[2], L. Cano[3], H. Quesada[1], O. Pardina[1], F. Rubio[1]
[1]Department of Neurology, Bellvitge University Hospital, [2]Department of Neurology, Sant Boi Hospital, [3]Bellvitge University Hospital, Barcelona, Spain

Background: Isolated cerebral vasculitis (ICV) is a serious and an unusual disorder which presents considerable difficulties in recognition, diagnosis and treatment. The results of magnetic resonance (MR) imaging and angiography are sensitive in ICV diagnosis but its specificity is unknown.
Methods: We studied four consecutive patients, 2 men and women; in whom this diagnosis was suspected. 3 patients, had multiple and bilateral acute ischemic lesions in diffusion-weighted MR imaging. A woman had a frontal right haematoma and also multiple acute infarcts. Both gray and white-matter infarcts were identified in all patients.
Results: Lesions identified on MR were associated with positive angiographic findings of cerebral vasculitis. But lumbar puncture and immunological screening and inflammatory laboratory markers were normal in all patients. Besides severe headache was absent in all of them, and they showed good recovery after stroke, for that reason brain biopsy was not performed. The only treatment was antiagregation in patients with ischemic stroke presentation and severe blood pressure control with antihypertensive treatment in haemorrhagic stroke. After 6-12 months they presented a good outcome and mRS<2. A possible diagnosis was benign angiopathy of the central nervous system however was diagnosed as Call Fleming syndrome, vascular changes by purpura thrombocytopenic idiopathic, transient vasoconstriction in response to malign hypertension or arteriosclerotic angiopathy and simultaneous embolism.
Conclusions: Several angiopathies or vascular disturbances, most of them reversible, could mimick a benign vasculitis. Angiographic and MR finding of cerebral vasculitis have a low specificity, nonetheless they continue to be useful in proper clinical context.

P2215

Midbrain infarction of the cerebral peduncle resulting in isolated motor stroke: a case report

A. Tinchon[1], S. Oberndorfer[1], B. Horvath-Mechtler[2], W. Grisold[1]
[1]Neurology, [2]Radiology, KFJ Hospital Vienna, Vienna, Austria

Introduction: The arterial blood supply of the midbrain arises from the basilar artery and its division in the left and right posterior cerebral artery. Midbrain infarction can cause a spectrum of clinical symptoms often determinated by eponyms (e.g. Weber, Benedikt, Claude syndrome). Infarcts confined to the cerebral peduncles are rare.
Case report: A 63-year-old male was presenting with fine motor skill disorder of the right hand and acute right central facial nerve palsy. Neurological examination revealed a mild, brachiofacial, right sided hemiparesis. Diabetes mellitus and arterial hypertension were detected as cerebrovascular risk factors. Diffusion weighted MRI exhibited a recent midbrain infarction confined to the left peduncle. The patient received an antithrombotic medication with salicylic acid and was treated for vascular risk factor reduction.
Conclusion: Midbrain infarcts are rare types of strokes, and are often characterized by a distribution affecting the parenchymal part of the midbrain. Ocular and cerebellar dysfunctions, often in alternating distribution are the clinical hallmark. Midbrain infarctions, strictly affecting the pyramidal tract in the cerebral peduncle are rarely observed. The peduncular perforating arteries, which diverge from the distal ends of basilar communicating arteries or directly from the posterior cerebral artery, are the supplying vessels of the peduncular region. Only four case reports of ischaemic infarctions of this distinct area have been described since 1982. All reported cases resulted in isolated, contralateral motor hemiparesis, which can be clinically indistinguishable from infarcts occurring in the internal capsule or the ventral part of the pons.

P2216

The effect of BMI on ischemic stroke prognosis

D. Savadi-Oskouei[1], M. Farhoudi[2], H. Barghi[3]
[1]Neurology, [2]Neuroscience Research Center, [3]Tabriz University of Medical Sciences, Tabriz, Iran

Background and aims: High BMI is an important risk factor of ischemic stroke and may be accompanied by poor prognosis for patients with ischemic stroke. The aim of this study was to determine possible effect of high BMI on the prognosis of ischemic stroke.
Materials and methods: We enrolled 116 cases of ischemic stroke admitted to the Neurology Ward of Tabriz Razi Hospital, 100 patients were followed up successfully. MRS & UNSS, the prognostic indices, were measured day 1 of admission and in follow-up time. The change in these scores was considered as clinical outcome to see if it is affected by BMI or not.
Results: Mean age was 12.03 years. 30% of participants were females. Pearson coefficient and Adjusted R-Square in measuring the relation between BMI and 6-month prognosis of these patients were ordinary equal to -0.213 & 0.036 ($p=0.033$) for MRS & equal to 0.576 & 0.332 ($p<0.001$) for UNSS.
Conclusion: High BMI which is an important risk factor for ischemic stroke, has high prevalence in these patients accompanied by poor prognosis.

P2217

Thromboembolism complicating heparin therapy in patients with ischemic stroke

S. Arai, W. Takahashi, Y. Ohnuki, S. Takizawa, S. Takagi
Neurology, Tokai University School of Medicine, Isehara, Japan

Purpose: The aim of this study is to elucidate the characteristics of thromboembolism complicating heparin therapy in the patients with ischemic stroke.
Methods: Among the patients with acute ischemic stroke admitted at Tokai University Hospital between January 2006 and July 2009, 175 patients with heparin therapy (mean age: 70 years) were selected for this study. We evaluated the relationship between platelet number, activated partial thromboplastin time (APTT), prothrombin time (PT) and vascular events occurred during heparin therapy.
Results: 175 patients in this study, vascular events were observed in 6 patients (3%). 4 patients had recurrent cerebral infarction, 1 had cerebral infarction with peripheral arterial embolism and 1 had peripheral arterial embolism with renal infarction. PT-INR in the group with vascular events showed a tendency to be lower than that in those without. Vascular event in a patient with markedly reduction of platelet number seemed as heparin-induced thrombocytopenia.
Conclusion: Thromboembolism complicating heparin therapy in the ischemic stroke patients may be mainly related with insufficient anti-coagulant therapy rather than heparin-induced thrombocytopenia.

P2218

Patients under 65 years with stroke or acute myocardial infarction: comparison of risk profiles

J. Kõrv[1], M. Eltermaa[1], R. Vibo[1], M. Blöndal[2], J. Eha[2]
[1]Department of Neurology and Neurosurgery, [2]Department of Cardiology, University of Tartu, Tartu, Estonia

Background: Cardiovascular diseases (CVD) are the main causes of disability and death among subjects aged ≤64 years in Estonia.
Methods: This retrospective study included patients aged ≤64 years hospitalised to Tartu University Hospital with the diagnosis of acute myocardial infarction (AMI) or ischemic stroke during 2008. Demographic data and CVD risk factors were registered.
Results: A total of 282 patients was included, 213 (76%) were men. 79 patients with the diagnosis of stroke and 203 with AMI. The age ranged from 21 to 64 (median 57) years. There were significantly more previous strokes among stroke patients ($p<0.01$) and previous myocardial infarctions among AMI patients ($p=0.002$). Hypertension was less prevalent among patients with stroke (75%) compared to patients with AMI (99%; $p<0.001$). The rates of concomitant diabetes (15%), cigarette smoking (56% vs. 54%) and dyslipidemia (71% vs. 70%) were similar for stroke and AMI, respectively. Women with AMI were older compared to men ($p=0.002$), no age and gender differences were found for stroke patients. In both disease groups male patients smoked twice as much as female patients. 15 (19%) of stroke patients had atrial fibrillation.
Conclusions: Frequency of CVD risk factors among ≤64-year-old patients with stroke and AMI are high and similar, and most importantly modifiable. This emphasises the importance of primary and secondary prevention of CVD. A national strategy for the prevention CVD for years 2005−2020 has been developed to decrease the burden of CVD among younger age-groups in Estonia.

P2219

Ipsilateral weakness caused by ipsilateral stroke

N.I. Kajtazi[1], M. Saqqur[2], E. Bakhsh[3], A. Hamad[1], F. Al Senani[1]
[1]Neurology, King Fahad Medical City, Riyadh, Saudi Arabia, [2]Neurology, University of Alberta, Alberta, AB, Canada, [3]Medical Imaging, King Fahad Medical City, Riyadh, Saudi Arabia

Introduction: Weakness originating from the brain or brainstem is caused by a contralateral lesion. We report two cases where right sided weakness was caused by ipsilateral stroke.
Background: A woman, 60 years old, with HTN, DM and previous stroke had a sudden onset of right sided weakness and slurred speech. She was dysarthric with right hemiparesis. CT brain: well defined hyperdensity in the right fronto-parietal region, superior to the sylvian fissure. MRI/A brain: late subacute hematoma in the right insula and posterior frontal lobe with surrounding vasogenic oedema and late subacute ischemic lesion in the right corona radiata. Old ischemic lesions in the left basal ganglia. Transcranial magnetic stimulation: normal anatomy, but right lower limb could not be stimulated. The patient made good recovery. A man 60 years old with HTN, DM, CAD, CHF while inpatient developed confusion with right sided weakness which improved after an hour. Naming and repetition were impaired. He had right to left disorientation, acalculia and agraphia. CT: dot sign in the distal portion of right MCA, hypodensity of right insular cortex. MRI/A brain: restricted diffusion along the right MCA territory, involving right insular cortex. The centre of lesion showed evidence of blood degradation products. The patient made good recovery. Discharged on warfarin.
Conclusion: Ipsilateral weakness from ipsilateral stroke has been reported in case reports. Most likely the mechanism of our patients' ipsilateral weakness was due to functional reorganization of the ipsilateral hemisphere, since they had evidence of previous stroke which makes less likely the possibility of congenital uncrossed pyramidal tracts.

P2220

Korsakoff-like amnesic syndrome in unilateral deep hemispheric infarct: a case report and review of the literature

G. Georgakoudas[1], A. Kaprinis[2], C. Kostopoulos[2], P. Maroudas[2], C. Koutras[2]
[1]Neurology, [2]Internal Medicine, Veroia Hospital, Veroia, Greece

Introduction: Korsakoff syndrome is almost always related to alcoholism or severe malnutrition. Bilateral lesions in dorsomedial and midline thalamic nuclei, hippocampal formations, mamillary bodies, and fornix are most commonly implicated. Acute Korsakoff-like syndromes after focal ischemic brain damage have been occasionally reported. A limited number of case reports documented amnesic-confabulatory syndrome following acute infarcts in anterior thalamus and mammillothalamic tract.
Case report: A 52-year-old man with history of arterial hypertension, smoking, and an ischemic stroke in the right pons with no clinically significant residual neurological deficit developed acute amnesic syndrome with retrograde and severe anterograde amnesia, impaired temporal order recall, loss of insight, and confabulations. He was fully alert, attentive, and responsive and did not have aphasia, apraxia, or executive dysfunction. Clinical examination revealed bilateral extensor plantar response, most prominent on the left. Neuroimaging showed an acute deep ischemic infarct in the genu of the right internal capsule marginally extending to the anterior thalamus and probably affecting the mammillothalamic tract.
Conclusions: Korsakoff-like amnesic syndrome can be the only clinical manifestation of unilateral deep hemispheric infarcts in patients with no history of alcoholism or malnutrition. Recent research suggests that bilateral mammilothalamic tract or anterior thalamic dysfunctions are necessary to develop fully apparent symptoms of Korsakoff syndrome.

P2221

Effects of prostaglandin E1 on perihematomal tissue after hypertensive intracerebral haemorrhage

C. Hong[1], K. Fu[1], S. Hua[2]
[1]Neurology, Hospital Affiliatal to Nantong University, Nantong, [2]Siping Health Service Center, Yanpu District, Shanghai, China

Objectives: To observe the effects of Prostaglandin E1 (PGE1) on hematoma, perihematomal tissue and the impairment of neurological function in patients with hypertensive intracerebral haemorrhage (HICH).
Methods: A total of 40 patients with HICH were enrolled according to the inclusion criteria and randomly divided into two groups: the control group (n=20) and the PGE1 treatment group (n=20). In each group, 99mTc-ethyl cysteinate dimer (ECD) SPECT brain perfusion imaging was performed on days 5 and 20 following admission, and the regional cerebral blood flow of the hematoma area, the proximal and distal regions of the hematoma surrounding tissue and the frontal and parietal lobe areas were calculated with semi-quantitative methods (the Ra value was shown as an uptake ratio). The volumes of hematoma and perihematomal tissue of the subjects (low-density areas around the hematoma as observed in the skull CT) were recorded by skull CT scan. Meanwhile, the NIHSS score for each patient was assessed upon admission and on the 5th, 12th, and 20th days of hospital stay. The mRS scores of each patient were recorded on the 1st and 20th days of admission. The NIHSS and mRS assessments were also performed three months following admission.
Results: In the PGE1 treatment group, the Ra values of the proximal and distal regions of the perihematomal tissue were significantly higher than those prior to treatment ($p<0.01$), and were significantly higher than the values in the control group ($p<0.01$). The Ra values in the frontal and parietal lobes showed no significance.

P2222

Delays during acute stroke management in patients with confirmed acute ischemic stroke

S. Jevdjic
Opsta Bolnica Pancevo, Pancevo, Serbia

Objective: It is recognized that early management of stroke in stroke units improves functional outcome and survival. Goal of this retrospective study is to recognize setbacks in stroke management in Neurology Department, General Hospital Pancevo.
Methods: We selected 90 (44 females) patients with confirmed acute ischemic stroke on CT and complete data. Demographic characteristics and history of stroke were analyzed.
Results: 52 patients were instantly admitted and 38 had a delay. In 12 cases family did not react in time (9 males), 13 patients were unrecognized by EMS (10 females), 7 patients refused to stay, in 3 CT was negative and in 3 it was not ordered. Gender difference between groups were statistically significant ($p<0.05$). Patients with delayed treatment were 5.5 years younger than others ($p<0.005$) and 12 patients who did not call EMS were the youngest ($p<0.05$). Left paresis was unrecognized by family ($p<0.05$), but EMS did not recognize left paresis ($p<0.05$), vertigo ($p<0.01$) and changed behaviour ($p<0.05$) as presenting symptoms of stroke. If disease started on Sunday patients were more often admitted ($p<0.05$) and if it started on Monday, stroke was unrecognized ($p<0.025$). Patients who were immediately hospitalized lived 6km closer to the hospital ($p<0.025$).
Conclusion: Younger males with acute stroke who live farther from hospital are hesitant to call EMS. Females with changed behaviour, vertigo and left sided weakness will be unrecognized, and neurologists are prone to ignore mild symptoms with negative initial CT.

P2223

Bilateral dissection of the internal carotid artery: a case report

I. Gkogkolakis, E. Nikolakaki, D. Tsiakiris, A. Kalamafkianaki, M. Foutouli, R. Hirmbaki, G. Georgakakis
2nd Neurology Department, Chania General Hospital, Chania, Greece

Background: Post-traumatic or spontaneous dissection of internal carotid artery is a common cause of stroke in young adults. Usual causes of spontaneous dissection are vasculitis and congenital syndromes.
Case report: We present a woman, 44 years old, with no medical or family history, who mentioned that for the last two months she had episodes of sparks or flashing lights (photopsia) in the left eye. Two days before her admittance to the hospital, she gradually developed right hemiparesis and Broca's aphasia. On brain MRI an extensive infarct was found in the distribution area of middle cerebral artery. Brain MRA was normal in both middle cerebral arteries but there was an occlusion in peripheral branches of the left cerebral artery. The cervical MRA revealed stenosis (60-70%) of the left internal carotid artery 5cm after bifurcation with a length of 2.5cm. Moreover there was also stenosis of the right internal carotid artery (30-40%) 2-3cm after the bifurcation, with length of 1cm. Digital Subtraction Angiography (DSA) of brain and cervical vessels showed dissection of both internal carotid arteries, mainly in left side. Laboratory tests for vasculitis were negative as the MRA scan of the other vessels of the woman's body.
Discussion: Remarkable in this case is the finding of bilateral dissection of the internal carotid arteries without underlying disease or injury.

P2224

Moya-moya disease in two patients: a case report

M. Ozturk[1], D.H. Ertem[1], O. Altiokka[1], F. Ayas[2], S. Baybas[1]
[1]Neurology, Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases, [2]Radiology, Bakirkoy Dr. Sadi Konuk Training and Research Hospital, Istanbul, Turkey

Objectives: Moya-moya disease (MD) is a condition where there is progressive occlusion of the ends of the internal carotid arteries and their major terminal branches. This disease is mostly found in Asians. There are only very rare data about MD in caucasians. The ischemic type has been shown to predominate in childhood, while the hemorrhagic type is more often observed in the adult population MD in caucasians differs clearly from Asian MD patients.
Methods: We report two female patients aged 15 and 48, who were diagnosed MD and we will discuss their complaining of symptoms, neurological examinations, cranial magnetic resonance imaging (MRI), cranial magnetic resonance angio (MRA), DSA (digital substraction angiography), Brain perfusion SPECT findings and the treatment.
Results: The first patient aged 15 had had several transient ischemic attacks on the left side before she had hemiparesis. Neurological examination revealed dysarthria, hemiparesis on the left side. Cranial MRA and DSA confirmed with MD. Acetylsalicylic acid 100mg was given. The second patient aged 48 had suffered progressive headache, amnesia, temporary vision loss in both eyes and difficulty in walking. Neurological examination revealed difficulty with tandem gait and cognitive dysfunction. DSA confirmed with MD. Brain perfusion SPECT showed aperfusion in bilateral frontal, parietal, mesial temporal lobes. She did not accept surgery.
Conclusion: Both of our two patients had ischemic stroke and classic "puff of smoke" appearance on their cerebral angiogram. Their clinical symptoms at presentation were similar with the US and European patients. There was no family history and they are thought as sporadic cases.

P2225

Lacunar infarcts in patients with metabolic syndrome

R. Chirileanu[1,2], A.L. Zolog[2], M. Simu[3], C. Rosca[2], L. Branzan[4], O. Chirileanu[5], R. Aldea[1]
[1]Neurology, Emergency County Hospital, [2]Neurology, University of Medicine and Pharmacy V Babes, [3]Neurology, Emergency Hospital Timisoara University of Medicine and Pharmacy V Babes, [4]Cardiology, University of Medicine and Pharmacy V Babes, [5]Internal Medicine IV, University of Medicine and Pharmacy 'Victor Babes', Timisoara, Romania

Background and aim: Metabolic syndrome with its components is frequently present in lacunar infarcts. This association significantly increases the risk of ischemic stroke. We compared patients with lacunar infarcts and small vessel disease with and without metabolic syndrome, in order to reveal the difference in the underlying disease.
Methods: We investigated clinically, neuropsychologically, and neuroimagistically a group of 150 patients with lacunar infarct , with SVD, and with or without metabolic sy. We compared the two groups regarding sex age, the neurological symptoms, the presence of leukoaraiosis, the number of lacunar infarcts.
Results: We included 150 patients with lacunar infarcts and SVD, (mean age 63 years), 58% were male. We selected 32 patients with metabolic syndrome and 118 patients without. The rate of multiple lacunar infarcts was higher in the group with metabolic syndrome. The prevalence of leukoaraiosis was higher in the metabolic syndrome group. Patients with metabolic sy had highsensitive C protein values higher than the patients from the other group. Also, cognitive decline was present in more patients with metabolic syndrome than in others. (Mild Cognitive Impairment with mean MMSE 26 versus 28).
Conclusions: Our results suggests that patients with metabolic syndrome and SVD present a higher degree of atherosclerosis than the other group. Patients with lacunar infarcts and SVD and metabolic syndrome had a more severe clinical course of the disease.

P2226

Risk factors for ischemic stroke subtypes

E. Kantorova[1], Š. Sivák[1], K. Zeleňák[1,2], J. Michalik[1], E. Kurča[1], P. Galajda[3]
[1]Neurology, [2]Radiology, [3]Internal Medicine, Faculty Hospital and Jessenius Faculty of Medicine, Comenus University, Martin, Slovak Republic

Objective: To evaluate risk factors for ischemic stroke subtypes may contribute to more effective prevention of ischemic stroke.

Methods: We classified 244 patients (128 men and 116 women) with acute ischemic stroke into three groups. Group I consisted of 126 patients with large vessel stroke. In Group II were 81 patients with lacunar stroke and in Group III were 37 patients with cardioembolic stroke. Neurological impairment was evaluated by NIHSS scale at the onset of disorder and after 10 days. We evaluated selected risk factors in all patients – BMI, waist circumference (WC), glycaemia, total cholesterol (CHOL), HDL and LDL cholesterol, triglycerides (TG), insulin resistance (IR). Spearman multivariate analysis was used to assess the relations between selected risk factors and NIHSS.

Results: We found differences in individual risk factors between various stroke subtypes. In Group I higher incidence of central and total obesity parameters (BMI p=0.01) and lipid metabolism impairment (HDL p=0.007; LDL p=0.02). In Group II dominantly glucose metabolism was impaired with insulin resistance (p=0.006). Cholesterol levels were associated with higher NIHSS and disability in women (p=0.018). In group III men's outcome was strongly associated with higher levels of triglycerides and age (p=0.02; p=0.001).Women's poorer outcome correlated significantly with central obesity parameter (WC p=0.03).

Conclusions: Information about actual risk factors are useful for subsequent management of patients.

This work was supported by Grant VEGA 10005/08.

P2227

Superficial subpial siderosis caused by thalamic cavernoma: a case report

K. Szöke[1], G. Várallyay[2], J. Vajda[3], A. Bagó[3], D. Bereczki[1], T. Kovács[1]
[1]Department of Neurology, [2]MRI Research Centre, Semmelweis University, [3]National Institute of Neurosurgery, Budapest, Hungary

Introduction: Symptomatic superficial subpial siderosis (SSS) is a rare and under-recognized condition with diverse neurological symptoms caused by subpial hemosiderin deposition. Here we report a case of SSS caused by thalamic cavernoma.

Case report: The 56-year-old female patient was seen because of a 3-year history of severe headache attacks, progressive short-term memory problems and word finding difficulty. At the initial attack, MRI of the head was described as negative and CSF was normal. On follow-up examinations, mild dilatation of the ventricular system was described and two years after the first complaints, SSS was described on the MRI with a T2 hyperintensity on the floor of the third ventricle. Digital subtraction angiography was negative. She was seen by us because of the cognitive problems. Dementia with prefrontal signs, literal paraphasias and short-term memory loss was found on neuropsychological examination. She also had frontal type gait and hypokinesis. SSS and a small hypo-intense lesion (on FFE T2-weighted images) in the right paraventricular posterior part of the thalamus was seen without feeding or draining vessels on the MR angiography. Siderophages were found in the CSF. Based on these findings, the cavernoma was surgically removed and histologically confirmed. The patient had mild vertical gaze palsy after the surgery which resolved after four weeks.

Conclusion: SSS because of thalamic cavernoma with successful surgical treatment is described. Our case illustrates that the diagnosis of these rare conditions is still difficult in spite of the sophisticated imaging methods.

P2228

Abstract cancelled

P2229

Carotid artery dysplasia as a cause of infrequent stroke

M. Montori-Lasilla[1], C. Tejero-Juste[1], R. Lasierra-Diaz[2], T. Corbalán-Sevilla[1], M.J. Gimeno-Peribáñez[2], M.P. Gil-Villar[1], M.P. Muniesa-Herrero[1], E. Mostacero-Miguel[1]
[1]Neurology, [2]Neuroradiology, Lozano Blesa University Hospital, Zaragoza, Spain

Objective: Arterial tortuosity, kinking or angulated internal carotid are artery factors of risk that are needed to know, control and treat. Our aim is to present several cases of carotid artery disease and a literature review, with special emphasis on treatment.
Clinical cases:
Case 1: Female, 55 years with history of transformed migraine and triptans abuse. She went to the emergency service after progressive weakness of right hand and four days before she underwent amaurosis fugax; fibromuscular dysplasia was identified in carotid angiography with critical stenosis at the level of C2.
Case 2: Female, 45 years old, sent to hospital emergency after she presented severe motor aphasia. Cerebral MRI angiography showed a beaded stenosis of the left M2 segment, which preceded an aneurysm of the left sylvian trifurcation.
Case 3: Male, 74 years, hospitalized for right parieto-occipital infarction, arterial hypertension and pacemaker for complete AV block. The CT angiography showed bilateral carotid dysplasia, symmetrical marked plicature and severe hemodynamic repercussions in duplex sonography of the cervical arteries.
Discussion: Revascularization of the extracranial internal carotid and symptomatic treatment of carotid plicatures are affordable with very low morbidity, but intracranial level, except for the embolisation of aneurysms, there are no defined guidelines for insured interventionist management of symptomatic dysplastic arteries.
Conclusion: Aneurysms, dissections and pulsatile lesions should be classified as pathological group similar to fibromuscular dysplasia and uncommon segmental, non atheromatous, non inflammatory arterial disease of unknown causation.

P2230

A case of "natural stroke"

M. Thekkumpuath[1], S. Hussain[2], S. Jadev[3], A. Amal[4], B.M. Kiran[5], T.P. Thahira[6], H. Shimna[7], A. Bashir[8]
[1]Dept. of Interventional Neurology, EMS Memorial Hospital, Perinthalmanna, [2]Interventional Neurology, Max Institute, New Delhi, [3]Internal Medicine, [4]Radiodiagnosis, [5]Interventional Neurology, EMS Memorial Hospital, Perinthalmanna, [6]Internal Medicine, KMC Manipal, Manipal, [7]Ophthalmology, Calicu Medical College, Calicut, [8]Dermatology, Command Hospital, Banglore, India

P2231

Wernicke's encephalopathy due to hyperemesis

K. Flamburiari[1], D. Kapatsoris[2]
[1]Neurological Clinic, [2]Internal Medicine, Sismanogleion, Athens, Greece

P2232

Remote haemorrhage in cerebral cortical vein thrombosis

M. Montori-Lasilla[1], L. García-Fernández[1], C. Tejero-Juste[1], J.I. Pina-Leita[2], E. Bellosta[1], C. González-Mingot[1], M.J. Gimeno-Peribáñez[2], E. Mostacero-Miguel[1]
[1]Neurology, [2]Neuroradiology, Lozano Blesa University Hospital, Zaragoza, Spain

P2233

Depressive symptoms as a consequence of a stroke

N. Milovanovic-Kovacevic, N. Zaric, M. Savic
Intensive Care for CVI, St. Sava Hospital for Cerebral and Vascular Diseases, Belgrade, Serbia

P2234

Giant cell arteritis with intracranial stenosis

D. Neutel, R. Peralta, L. Biscoito, T. Pinho e Melo, L. Albuquerque
Hospital Santa Maria, Lisbon, Portugal

P2235

Deep white and gray matter lesions on diffusion-weighted MRI in hypoglycaemic coma

J. Joung, D. Jung
Neurology, Soonchunhyang University, Gumi-City, Republic of Korea

P2236

Phospholipase A2 in patients with non-cardioembolic ischemic stroke and severe inflammatory reaction

I.M. Cojocaru[1], M. Cojocaru[2], R. Tanasescu[1], L. Butnaru[3], G. Miu[3], C.V. Gurban[4], F. Sfrijan[4]
[1]Neurology, 'Carol Davila' Univ of Med and Pharm, [2]Physiology, 'Titu Maiorescu' Univ, Faculty of Medicine, [3]Neurology, Colentina Clinical Hospital, Bucharest, [4]Biochemistry, 'Victor Babes' Univ of Med and Pharm, Timisoara, Romania

P2237

Evaluation of hyperuricemia in non-insulin dependent diabetes mellitus patients with and without stroke

M. Moghaddasi[1], M. Mamarabadi[1], H. Razjouyan[2]
[1]Neurology, Rasool Akram Hospital, Iran University of Medical Sciences, [2]Digestive Research Center, Tehran University of Medical Sciences, Tehran, Iran

P2238

Detection of modification of flow within vertebral arteries (with and without kinking), with the manoeuvre of lateral mobilization of the neck

R. Rangel-Guerra[1], A. Garcia-de la Fuente[2]
[1]Professor of Neurology, Hospital Universitario UANL, [2]Radiology, Hospital Christus Muguerza, Monterrey, Mexico

P2239

Study of patients with lipidemic profile with background of acute ischemic stroke (CVA) and its correlation with age of appearance

S. Patiakas[1], I. Rizopoulos[2], G. Liapas[1], S. Sarafidis[1]
[1]Microbiological Laboratory of General Hospital of Kastoria, [2]Neurological Clinic of General Hospital of Kastoria, Kastoria, Greece

P2240

Increase of the proportion of hemorrhagic stroke

L.B. Kuanova, O.L. Tian, A.A. Turebekova, A.M. Karimova
Kazakh National Medical University Astana, Kazakhstan

P2241

Carotid artery plaques and intima-media thickening: are they risk factors for ischemic strokes in patients with type-2 diabetes mellitus?

M.F. Oztekin, N. Oztekin, O. Bizpınar-Munis, G. Senyigit
1st. Neurology Department, MOH Ankara Yildirim Bayazit Education & Research Hospital, Ankara, Turkey

P2242

Metabolic syndrome incidence in cerebrovascular disease and the role of carotid intima-media thickness

E. Çoban[1,2], I. Aslan[2], D. Kırbaş[2]
[1]Şişli Etfal Hospital, [2]Bakırköy Mental Health Hospital, Istanbul, Turkey

P2243

Bilateral internal carotid artery thrombectomy: a case report

M.O. Romanitan[1], A. Craciunoiu[1], B. Dorobat[2], R. Nechifor[2], G. Iana[2], O.A. Bajenaru[1], F.A. Antochi[1]
[1]Neurology, [2]Radiology, Emergency University Hospital, Bucharest, Romania

P2244

Endovascular treatment of cerebral aneurysms – our experience

M.O. Romanitan[1], O.A. Bajenaru[1], B. Dorobat[2], R. Nechifor[2], F.A. Antochi[1]
[1]Neurology, [2]Radiology, Emergency University Hospital, Bucharest, Romania

P2245

Multiple cerebral ischaemic stokes due to head hyperextension

K. Flamburiari[1], M. Pyrgiotou[2], H. Makriyiannis[2]
[1]Neurological Clinic, General Hospital of Athens, Sismanogleion, Patras, [2]Internal Medicine, Sismanogleion, Athens, Greece

P2246

Products of the catabolic breakdown of cell receptors (R-proteins) in patients with cerebrovascular disorders

H.O. Bakunts, A.C. Torosyan, K.F. Bagdasaryan, G. Aghakhanyan
Department of Angioneurology, National Institute of Health, European Medical Centre 'Stroke', Yerevan, Armenia

P2247

A case series of 20 patients with internal carotid artery dissection

I. Divjak, P. Slankamenac, M. Jovicevic, A. Jesic, A. Lucic Prokin, Z. Zivanovic, A. Jovanovic, N. Popovic
Institute of Neurology, Clinical Center of Vojvodina, University of Novi Sad, Novi Sad, Serbia

P2248

Color Doppler Imaging (CDI) of retrobulbar vessels findings in giant cell arteritis with eye involvement

D.C. Jianu[1], S.N. Jianu[2], L. Petrica[3], M. Serpe[4]
[1]Neurology, University of Medicine and Pharmacy V Babes, [2]Ophtalmology, Emergency Military Hospital, [3]Internal Medicine, University of Medicine and Pharmacy V Babes, Timisoara, [4]Neurology, Municipal Hospital, Lugoj, Romania

P2249

Cerebral white matter lesions in cerebral ischemic events and multiple sclerosis

A. Hancu[1], D. Zguma[1], A. Docu Axelerad[1], I. Damian[2], M. Kaivanifard[1], C. Hertea[1], A. Stefanescu[1], S. Popescu[3]
[1]Department of Neurology, Emergency Hospital of Constanta County, [2]Department of Neurology, CFR Hospital of Constanta, [3]Department of Radiology, Emergency Hospital of Constanta County, Constanta, Romania

P2250

Not always a stroke (right hemiparesis and numbness in the right side of the body and face caused by cervical neurilemmoma)

E. Giannouli, N. Apostolakos, K. Kioulachidis, M. Gryllia, C. Samara, K.E. Karageorgiou
General Hospital of Athens G. Gennimatas, Holargos, Greece

P2251

Relationship between obstructive sleep apnoea/hypopnoea syndrome and myocardial infarction in patients with cerebral ischemia

I. Burduladze[1], R. Shakarishvili[1], A. Chikadze[2]
[1]Clinical Neurology, ICU, P. Sarajishvili Institute of Neurology and Neurosurgery, [2]Video EEG and Sleep Laboratory, Georgian Association of Sleep Medicine and Clinical Electrophysiology, Tbilisi, Georgia

P2252

Complete recovery of bilateral ophthalmoplegia, following embolisation of a dural carotid-cavernous arteriovenous fistula

E. Papageorgiou, S. Filippidou, I. Markakis, G. Gkekas
Neurology, "St. Panteleimon" General State Hospital of Piraeus, Nikaia, Greece

P2253

Stroke and organically modified personality

A. Tiugan[1], C. Tiugan[2]
[1]Psychiatry, University of Medicine and Pharmacy Craiova, [2]Psychiatry, Emergency Military Clinical Hospital, Craiova, Romania

P2254

Hyperlipidemia-risk factor for development of ischemic stroke

J. Djelilovic-Vranic, M. Tiric-Campara, N. Subašić, A. Alajbegovic, L. Todorović
Neurology Clinic, Clinical Center of Sarajevo University, Sarajevo, Bosnia-Herzegovina

P2255

Role of intraoperative ultrasonic research in diagnostics of microembolic signals during carotid angioplasty and stenting internal carotid artery

R. Medvedev[1], A. Kosheev[2], V. Shipakin[2], S. Skrilev[2], G. Kuntcevich[1], M. Tanashyan[3]
[1]Department of Ulrasound, [2]Vascular Surgery, [3]Department of Cerebrovascular Diseases, Research Center of Neurology, Moscow, Russia

P2256

Cerebral fat embolism detected in delayed gradient-recalled echo sequence

J.-H. Kwon[1], D.-S. Yang[2]
[1]Neurology, [2]Rehabilitation, Ulsan University Hospital, Ulsan, Republic of Korea

P2257

The prediction of atherogenetic stroke etiology by measuring serum paraoxonase (PON) activity

H. Horozoglu, S. Aktan, N. Afsar
Department of Neurology, Marmara University, Istanbul, Turkey

P2258

The prediction of cardioembolic stroke etiology by measuring P-wave dispersion at index ECG and ectopies at Holter-monitoring

H. Horozoglu[1], N. Afsar[1], S. Aktan[1], A.S. Fak[2]
[1]Department of Neurology, [2]Department of Cardiology, Marmara University, Istanbul, Turkey

P2259

Depression in early stroke: effects of hemiplegic side

E. Atasay, D. Gürbüz, E. Ayvat, S. Aksu
Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey

P2260

Correlates of health related quality of life in early stroke

E. Atasay, D. Gürbüz, E. Ayvat, S. Aksu
Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey Centre Maribor, [3]Neurology Department, University Medical Centre Maribor, Maribor, Slovenia

P2261

Bilateral paramedian thalamic infarction: a case study and literature overview

E. Papuc, K. Rejdak, Z. Stelmasiak
Department of Neurology, Medical University of Lublin, Lublin, Poland

P2262

Evaluation of oxidative stress by TAS (Total Antioxidant Status) in patients with acute ischemic stroke

I. Varga[1], I. Pascu[2], I. Ionescu[3]
[1]Neurology, Neurology and Psychiatry Hospital, 'Transilvania' University, Brasov, [2]Neurology, University of Medicine and Pharmacy, Targu- Mures, [3]Centre of Neuro-muscular Diseases „Dr. Horia Radu", Valcele -Covasna, Romania

P2263

Cerebral venous thrombosis: clinical features and outcome

M. Sparaco[1], C.F. Muccio[1], F. Piemonte[2], B. Carletti[2], M. Feleppa[1]
[1]Department of Neurosciences, A. O. 'G. Rummo', Benevento, [2]Molecular Medicine Unit, Children's Hospital and Research Institute "Bambino Gesù", Rome, Italy

P2264

Cerebral haemorrhage after intra-arterial thrombolysis for acute ischemic stroke

Y.S. Kim, H.G. Kang, H.Y. Park
Neurology, Wonkwang University School of Medicine, Iksan, Republic of Korea

P2265

Effect of antiplatelet agent on the progression of white matter change: a preliminary study

S.-H. Kim[1], Y. Choi[1], I.-G. Kim[1], C. Song[1], I.-T. Han[1], C.-G. Hong[1], J.-H. Rha[1], J.-S. Koo[2]
[1]Neurology, Inha University Hospital, Incheon, [2]Neurology, Eulji Hospital, Seoul, Republic of Korea

P2266

Statins after recent stroke reduces six-year stroke recurrence and improves survival in an aging Mediterranean population without known coronary heart disease

A. Sicras-Mainar[1], A. Planas-Comes[2], X. Frias-Garrido[3], R. Navarro-Artieda[4], M. De Salas-Cansado[5], J. Rejas-Gutiérrez[5]
[1]Directorate of Planning, Badalona Serveis Assistencials SA, Badalona, [2]Department of Neurology, Badalona Serveis Assistencials SA, Badalona, [3]Primary Healthcare Unit, Badalona Serveis Assistencials SA, Badalona, [4]Department of Medical Information and Documentation, Hospital Germans Trias i Pujol, Badalona, Barcelona, [5]Health Outcomes Research Department, Medical Unit, Pfizer Spain, Alcobendas, Madrid, Spain

P2267

When encephalopathy, retinal occlusions and hearing loss can alert to a diagnosis

S.M. França[1], P. Barros[1], D. Ferreira[2], M. Pinto[1], J. Massano[1], P. Abreu[1]
[1]Neurology, Hospital de S.João, [2]Neuroradiology, Hospital S.João, Porto, Portugal

P2268

Abstract cancelled

P2269

Singular aetiologies of cerebral venous thrombosis

D. Hakem[1], D. Meriam[2], M. Abada-Bendib[3], H. Boukrara[1], F. Kessaci[4], A.-N. Masmoudi[3], B. Mansouri[4], A. Berrah[1]
[1]Internal Medicine, Dr. Mohammed-Lamine Debaghine's Hospital, Bab El Oued Universitary Hospital Center, [2]Dr. Mohammed-Lamine Debaghine Hospital, Bab El Oued university Hospital Centre, [3]Neurology, [4]Imaging Centre, Dr. Mohammed-Lamine Debaghine's Hospital, Bab El Oued Universitary Hospital Center, Algiers, Algeria

P2270

Haemorrheological study in a group of patients with clinically silent multifocal vascular cerebral lesions

P. Kowal[1], I. Siemieniak[2], A. Marcinkowska-Gapinska[3]
[1]Neurology, University of Medical Sciences, [2]Neurology, Strus Hospital, [3]Rheological Laboratory, University of Medical Sciences, Poznan, Poland

P2271

Rivastigmine therapy in the acute phase of stroke in patients with delirium

Y.V. Khlystov, I.V. Litvinenko
Department and Clinic of Neurological Diseases, Russian Medical Military Academy n.a. S.M. Kirov, Saint-Petersburg, Russia

P2272

The correlation between plasma level of glucose and neurological disorder degree in non-diabetic patients with ischemic and hemorrhagic brain injury

A. Prazic[1], S. Ljubisavljevic[2], J. Visnjic[2], S. Pejcic[3], D. Lukic[1], L. Milenkovic[1], B. Zivadinovic[1]
[1]Clinical Centre of Nis, [2]Medical Faculty of Nis, [3]Health Centre of Nis, Nis, Serbia

P2273

Bleeding into the medulla oblongata: a description of cases

A. Karp-Majewska[1], B. Adamkiewicz[1], M. Kolasa[2], M. Tyślerowicz[1], K. Kierkus-Dłużyńska[1], A. Głąbiński[1], P. Kolasa[2]
[1]Department of Neurology, [2]Department of Neurosurgery, Copernicus Hospital, Lodz, Poland

P2274

Cerebral circulation features in patients with Kimmerle anomaly

A. Komyakhov, M. Zhukova, E. Klocheva
Neurology, Saint Petersburg State Medical Academy Named after I.I. Mechnikov, Saint Petersburg, Russia

P2275

Reducing the risk of recurrent ischemic stroke after different subtypes of transient ischemic attacks along with emergency differentiated treatment

O.E. Fartushna
Neurology, Alexander Clinical Hospital of National Medical University of Ukraine, Kiev, Ukraine

P2276

Extended monitoring in cardioembolic stroke

I. Voznyuk, A. Polushin
Neurology, Medical Military Academy, Saint Petersburg, Russia

P2277

Ischemic strokes among patients with hypoplasia of vertebral artery

D.S. Druzhinin, N.V. Pizova
Department of Neurology, Medical Genetics and Neurosurgery, Yaroslavl State Medical Academy, Yaroslavl, Russia

P2278

Prognostic value of auditory brainstem evoked potentials in acute hemorrhagic stroke

A. Martyniuk[1], M.L. Kaminski[2], A. Melges[2], S. Szklener[2], K. Rejdak[2], Z. Stelmasiak[2]
[1]Department of Neurology, Medical Univestity of Lublin, [2]Neurology, Medical University of Lublin, Lublin, Poland

P2279

The platelet system activation in different types of brain ischemic infarctions

V. Goldobin, E. Klocheva, P. Asadullaeva, N. Mashkova
Saint Petersburg State Medical Academy, Saint Petersburg, Russia

P2280

Abstract cancelled

Epilepsy 2

P2281

Women's issues and epilepsy: a look at health care professionals in Africa

T.A. Sunmonu[1], O. Afolabi[2], O.A. Ogunrin[3], M.A. Komolafe[4], S.A. Ogun[5]
[1]Medicine, Federal Medical Centre, Owo, [2]Community Medicine, Obafemi Awolowo University Teaching Hospital Complex, Ile – Ife, [3]Medicine, University of Benin Teaching Hospital, Benin City, [4]Medicine, Obafemi Awolowo University Teaching Hospital Complex, Ile – Ife, [5]Medicine, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria

Background: Previous reports from developed countries indicated that health care professionals had poor knowledge of women's issues and epilepsy and the women with epilepsy may not be adequately informed about their illness.
Methods: Health care professionals who attended the 18th Pan African Association of Neurological Sciences in Yaounde, Cameroun were asked to complete the knowledge of women issues and epilepsy (KOWIE) II questionnaire.
Results: A total of 55 health care professionals participated in the survey. 67.3% were males while 32.7% were females. The mean age of the respondents was 39.35 (±12.07) years. About 36% of the respondents were neurologists, 27.3% were in internal medicine while the rest comprised of general practitioners, paediatric neurologists, neurosurgeons, neuroscience nurses and neurophysiologists. There was poor knowledge of the effect of sex hormones on seizure threshold during menstrual cycles and presence of sexual dysfunctions in women with epilepsy. About half of the respondents were aware of the deleterious effect of antiepileptic drugs on bone health. Their knowledge was better on pregnancy-related issues and epilepsy. There was no relationship between the number of years in practice or the number of patients seen per month by the respondents and the survey accuracy score. But the specialty of the respondents influenced the survey score as the paediatric and adult neurologists had the highest survey accuracy score.
Conclusion: This study showed that the paediatric and adult neurologists were better informed on women's issues and epilepsy than other clinical neuroscientists.

P2282

The occurrence of polycystic ovary syndrome in women with epilepsy

A.Z. Ilic
Neurology, Health Centar Studenica, Kraljevo, Serbia

Purpose: To determine the occurrence of polycystic ovary syndrome (PCOS) in women with epilepsy on antiepileptic drug monotherapy.
Methods: This is a prospective open study which included 90 women with epilepsy, aged between 18 and 40 years, on antiepileptic monotherapy – valproate, carbamazepine or lamotrigine. 30 patients (33.3%) were treated with valproate, 30 (33.3%) with carbamazepine and 30 (33.3%) with lamotrigine. Patients were followed-up for 6 months. Patients were screened for the occurrence of menstrual abnormalities, weight change and hirsutism. In all women ovarian ultrasonography was examined. PCOS was defined as hyperandrogenism combined with oligomenorrhea (cycle length >35 days) or amenorrhea.
Results: Menstrual abnormalities were observed in 33.3% receiving valproate (oligomenorrhea occurred in 7 patients, amenorrhea in 1, polymenorrhea in 2), 16.6% receiving carabamazepine (oligomenorrhea 4, polymenorrhea 1), 13.3% receiving lamotrigine (oligomenorrhea 3, polymenorrhea 1). Significant weight gain was registered in 36.6% of the patients treated with valproate, 13.3% with carabamazepine, and 3.3% with lamotrigine. 43.3% of valproate-treated women, 26.6% of carabamazepine-treated women and 16.6% of lamotrigine-treated women had PCOS. Valproate-treated women had significantly higher frequency of PCOS (10.2% vs. 2.4%, $p<0.0001$) compared with women treated with other AEDs.
Conclusion: Valproate-treated women had significantly higher frequency of PCOS, compared with women treated with other AEDs. This emphasizes the importance of careful endocrine observation of patients taking valproate for epilepsy.

P2283

Vagus nerve stimulation therapy for children with refractory epilepsy in a developing country: what if you had to pay?

S.K. Aburahma[1], A. Masri[2]
[1]Neuroscience, Jordan University of Science and Technology, Irbid, [2]Jordan University, Amman, Jordan

Introduction: Given the disproportionately high cost of vagus nerve stimulation (VNS) compared to cost of medical care in developing countries, a cost effectiveness argument is difficult to make. With limited resources, a degree of efficacy higher than accepted in developed countries seems to be required for third parties to cover costs.
Objective: To describe the response of children with refractory epilepsy to VNS therapy in Jordan, and parent's attitudes in retrospect towards contributing financially for implantation.
Methods: Retrospective analysis of children with VNS from the 2 major university hospitals in Jordan. The seizure severity questionnaire (SSQ) and medical records were utilized. Parents were asked whether in retrospect they would have been willing to pay for implantation.
Results: Of 24 children with VNS, 21 were followed more than 6 months. Source of funding was royal court exemption or private donations. Seizures were focal in 12, generalized in 6, and akinetic in 4. 12 rated an improvement in seizure severity and bothersomeness as more than 5/7 on the SSQ, and stated that in retrospect they would definitely be willing to pay or contribute for device implantation. In the remaining 9, no satisfactory response was noted.
Conclusions: A response rate of 55% is considered encouraging and comparable to that reported from developed countries. However for developing countries with limited resources and fragmented health insurance systems, this response is unconvincing to third party payers. Improving prediction of response encourages coverage by insurance parties and parental contribution, improving delivery of VNS to children in need.

P2284

Clinical feasibility of immediate overnight switching from carbamazepine to oxcarbazepine in Korean patients with refractory partial epilepsy

B.-I. Lee[1], S.-A. Lee[2], K. Heo[1], W.-J. Kim[1], H.-K. Song[3], S.-E. Kim[4], S.-H. Kim[5], S.-K. No[6]
[1]Department of Neurology, Yonsei University College of Medicine, [2]Department of Neurology, University of Ulsan, [3]Department of Neurology, Hallym Institute of Epilepsy Research, Seoul, [4]Department of Neurology, Inje University, [5]Department of Neurology, Dong-A University, [6]Department of Neurology, Bong-Seng Memorial Hospital, Busan, Republic of Korea

Background and aims: We assessed the clinical variables predicting the feasibility of immediate overnight switching from carbamazepine (CBZ) to oxcarbazepine (OXC) in Korean patients with refractory partial epilepsy.
Methods: Patients aged ≥15 years with a diagnosis of partial epilepsy were recruited. Subjects were included if they had at least three seizures during a 12-week baseline period and were being treated with CBZ, either as monotherapy or as combination therapy. Patients were switched from CBZ to OXC overnight. The conversion ratio (CBZ:OXC) was 1:1.5 for CBZ doses of 400-800mg/day and 1:1.2 for CBZ doses of 900-1,600mg/day.
Results: 30 patients underwent a switch from CBZ to OXC. Among them, 29 (96.7%) had been treated with a slow-release formulation of CBZ. The proportion of patients with polytherapy was 85.3%. Overall, 9 of 30 (30%) switched patients experienced clinically significant adverse events until 2 weeks after switching, including 2 with seizure aggravation. The only clinical variable related to the occurrence of clinically significant adverse events was the number of seizures during the baseline period, which was significantly higher in those with adverse events than in those without them (10.3 vs. 6.7, $p<0.05$).
Conclusion: A comparison of our results with those of previous studies of immediate overnight switching from CBZ to OXC suggests that patients, taking higher daily dosages of CBZ, a slow-release formulation of CBZ, or polytherapy including CBZ, may be at higher risk of switch failure.

P2285

Cognitive impairment is very common in cryptogenic epilepsy

K. Phabphal, S. Sethavachiravanich, P. Sathirapunya, K. Limapichart
Medicine, Prince of Songkla University, Hat Yai, Thailand

Objective: Epilepsy is a common chronic neurological disorder. Epilepsy could effect the cognition. This study was designed to assess cognitive function in cryptogenic epilepsy.
Methods: 106 patients (43 male and 63 female) with cryptogenic epilepsy were recruited from the out patients general medical clinic, neurological clinic and epilepsy clinic at Songkhlanagarind hospital. The Montreal Cognitive Assessment was used to assess the Alternative Trial Making, Visuoconstructional skills (cube, clock), naming, memory, attention (forward and backward digit span, vigilance, serial 7s), sentence repetition, verbal fluency, abstraction, delay recall and orientation.
Results: The mean ages (in years) of patients with cryptogenic epilepsy were 31.4±11.7 52 patients taking monotherapy and 54 patients taking polytherapy. 71 patients (67%) had a low MOCA score (≤25). Education and number of medications associated with low MOCA score (p=0.02 and p=0.016, respectively). The patients with low MOCA score had significantly poorer compliance.
Conclusion: This study showed that cognitive impairment is very common in cryptogenic epilepsy. We suggested that cognitive function assessment should be an integral part of routine evaluation of patients with epilepsy.

P2286

Prevalence of drug resistant epilepsy in children: a 1-year prospective study in two Polish epilepsy centres

M. Mazurkiewicz-Beldzinska[1], B. Steinborn[2], M. Szmuda[1], A. Winczewska-Wiktor[2]
[1]Department of Developmental Neurology, Medical University of Gdansk, Gdansk, [2]Developmental Neurology, Poznan University of Medical Sciences, Poznan, Poland

Purpose: To evaluate the prevalence of drug-resistant epilepsies among children and adolescents with epilepsy.
Method: All epilepsy patients who entered the Developmental Neurology Departments (In and Outpatients Clinics) in the period between 01.10.2008 and 01.10.2009 were included in the study and followed prospectively. 1053 children and adolescents with diagnosed and treated epilepsy entered the study. The diagnostic criteria for drug resistant epilepsy were: failure of adequate trials of two tolerated and appropriately chosen and used AED schedules (whether as monotherapy or in combination) to achieve sustained seizure freedom. (Kwan et al. 2009)
Results: 49% of patients fulfilled the criteria for drug-resistant epilepsy. The most common types of seizures among drug-resistant patients were complex partial seizures or polymorphic generalized seizures (tonic, tonic-clonic and myoclonic).
Conclusion: This large population-based study shows according to recently proposed definition the surprisingly high incidence of drug-resistant epilepsies among children and adolescents.
Kwan, P., Arzimanoglou, A., Berg, A.T. et al. Definition of drug resistant epilepsy. Consensus proposal by the ad hoc task force of the ILAE Commission on therapeutic strategies (2009) Epilepsia.

P2287

Stroke and status epilepticus

N. Radojkovic-Gligic, P. Nikic, S. Atic
Special Hospital for Cerebrovascular Diseases 'Sveti Sava', Belgrade, Serbia

Background: Stroke is the most common cause of acute symptomatic seizures, epilepsy and status epilepticus (SE) in the elderly population. The objective of this study is to investigate the occurrence rate and type of status epilepticus associated with acute stroke.
Methods: We used our hospital-based stroke data base to identify all patients with acute post-stroke seizures and SE admitted at our hospital from January 2009 to December 2009. Acute post-stroke seizures were defined as occurring within 7 days of the onset of stroke. SE was defined as a seizure or series of seizures lasting more than 30 minutes without recovery of consciousness. Type of seizure was classified according to criteria developed by the International League Against Epilepsy.
Results: Of the 4,340 stroke patients, 544 (12.5%) had intracerebral haemorrhage and 3,796 (87.5%) had ischemic stroke. Among them 363 patients (8.36%; mean age 70.9±9.7 ys. range 39-98 ys.) experienced acute seizures. 16 patients (4.5%) developed SE (mean age 71.7±9.6 ys, range 56-84 ys.). Generalized SE occurred in 7 patients, partial motor SE in 5 patients, complex partial SE in 2 patients and in 1 patient SE was unclassifiable. The SE mortality rate was significantly higher in patients with intracerebral haemorrhage.
Conclusions: Generalized SE and partial motor SE are the most frequent types of SE in the setting of acute post-stroke seizures. Generalized SE increases the mortality, particularly in patients with intracerebral haemorrhage.

P2288

Neural-net method for EEG analysis to estimate remission stage of epilepsy

V. Kistsen[1], V.V. Evstigneev[1], V.S. Ulashchic[2], S. Laurentsyeva[3]
[1]*Neurology Department, Belarusian Medical Academy of Postgraduate Education,* [2]*Institute of Physiology, Minsk,* [3]*Intelligent Information Technologies Dept., Brest State Technical University, Brest, Belarus*

Purpose: Epilepsy is one of the most serious neurological disorders, affecting 1% of the population in the world. The important application of the chaos theory is the processing of EEG data with purpose of the detection and prediction of epileptic seizures.
Method: The use of neural networks for computing the highest Lyapunov's exponent was presented. The main idea of such method is prediction using the multilayer perceptron for two nearest trajectories calculation to take next steps. In our research we used 30 registrations of the EEG signals taken from 10 epilepsy patients. We made experiments on the EEG signals that characterized different (epileptic and normal) stages.
Results: The neural-net method gave a good result. There were about 96.7% of epileptiform activity detections and not many with false detection (5.0%). In a case when we had false detections, it created a need of extended research. On one side the reason of that might lie in the low accuracy of the method. On the other side it might be epileptiform activities which were invisible on EEG signals.
Conclusion: The experimental results showed that presented approach for EEG analysis by the value of the largest Lyapunov's exponent is applicable to estimate remission stage of epilepsy. In an epileptic's brain, the amount of chaos decreases and the maximum Lyapunov's exponent is decreased in the leading up to seizures that can be used to detect.

P2289

Clinical and immunological peculiarities of autoimmune-mediated acquired epilepsy

Y. Lekomtseva
Institute of Neurology, Psychiatry and Narcology, Kharkiv, Ukraine

The involvement of the immune system in epileptogenic processes has been postulated in the pathogenesis of particular epilepsy forms where antibody-mediated autoimmunity was shown as association of seizures with certain immune-mediated diseases.
The objective was to assess clinical and immunological alterations of immune-mediated seizures.
Method: Patients with long-standing drug-resistant epilepsy (n=68, aged 22-41 years) took part in the study. Among this cohort a series of 11 patients (16.2%) have experienced epilepsy since 7.3±4.2 years after a history of immunization/ vaccination/ allergia were highlighted (immune epilepsy, IE). Control neurological group, NG (n=57, aged 22-38); healthy controls, HC (n=16; aged 19-31).
Results: Immune status showed presence of serum specific IgE in 27.3% patients IE; serum level of IgG (IE: 18.80±5.40mg/ml vs. NG: 11.60±4.60 vs. HC: 12.20±5.50), IgM (1.46±0.55 vs. 1.22±0.4 vs. 1.2±0.45), CD4 (29.00%±2.00 vs. 38.00%±6.80 vs. 44.00%±8.7); CD8 (14.00%±4.00 vs. 19.00±4.00 vs. 28.00±6.50); CD19 (26.00%±5.00 vs. 22.00±4.50 vs. 18.00±5.60); $p>0.05$. There was a tendency to the decreasing of functional activity of T-cell lymphocytes associated with a high level of immunoglobulins in IE. All patients with immunological alterations have chronic drug-resistant course (mean IE duration 28.71±11.5) of secondary generalized epilepsy, spike-abnormalities on EEG, predominantly left-side focus mainly at occipital, mid temporal, central lobes; high seizure-frequency, psychiatric complications, severe cognitive decline. 45.4% patients IE, 42.1% patients NG had mesial temporal sclerosis identified with MRI; neurological status showed focal symptomatology in 81.8% patients IE, 54.39% patients NG.
Conclusion: Changes of humeral immunity were present in 16.2% patients with IE and they may play an additional role in the pathogenesis of autoimmune-mediated acquired epilepsy.

P2290

Risk of seizure recurrence after antiepileptic drug withdrawal

S. Al Faqih
AUB University, Beirut, Lebanon

Objective: To assess the recurrence rate in patients with epilepsy during and after discontinuation of antiepileptic drug (AED) treatment who had been seizure free for either 2 or 4 years and to identify the risk factors for recurrence of seizures.
Methods: This is a prospective study of 136 patients with epilepsy. The patients were randomized into 2 groups: Group A (56 patients) was treated with AEDs for 2 years and Group B (80 patients) was treated for 4 years. The patients were evaluated periodically during and at least 18 months after the tapering of drugs.
Results: Seizure recurred in 30 patients (31%) during the follow-up period of 18 months. The length of time the patients were free of seizures before drug withdrawal began (2 years versus 4 years) did not significantly influence the risk of recurrence. Longer duration of active epilepsy (relative risk 2.86, 95% CI 2.35-3.48) and higher number of seizures prior to the seizure control (relative risk 1.50, 95% CI 1.30-1.73) increased the risk of recurrence.
Conclusion: The risk of recurrence during drug tapering after discontinuation of AEDs was related to the duration of active disease and number of seizures prior to control.

P2291

Aphasia as the single manifestation of status epilepticus

S. Machado[1], J. Marques[2], R. Ginestal[1], A. Martins[1]
[1]Serviço de Neurologia, Hospital Professor Doutor Fernando Fonseca, EPE, Amadora, [2]Serviço de Neurologia, IPO Francisco Gentil, Lisboa, Portugal

Introduction: Prolonged and isolated language disturbances of epileptic origin are uncommon and may result from partial epileptic crisis. Paroxysmal aphasias have been classified as dysphasic seizures, with impairment of the comprehension, and as phonatory, when there is a production deficit. Focal status epilepticus with aphasia as its only manifestation is very rare. We present a case report with an unequivocal relation between a prolonged episode of aphasia and a status epilepticus.
Case report: A 53-year-old, right handed woman was admitted to our hospital due to an episode characterized by sudden onset of aberrant behaviour and comprehension impairment. At the ER a single generalized tonic-clonic seizure was observed. The limitation of comprehension persisted and a difficulty in the language production was observed de novo. She had no history of head trauma, infection or epilepsy. However she recalled a previous episode of difficulty in the comprehension of verbal language. Her general and neurologic examination revealed no other abnormalities. The CT-Scan was unremarkable but the EEG showed an abundant posterior temporal paroxystic activity. There were no other alterations in the investigation, namely in the MRI and LP. After the initiation of sodium valproate she recovered completely. At discharge she was asymptomatic and without any pathologic activity in the EEG.
Conclusion: The clinical report is singular as it meets the diagnostic criteria of aphasic status. The epilepsy should figure in the differential diagnosis of an isolated and even repeated aphasia. When the etiology is not precise, electroencephalographic alterations should be found.

P2292

The attitudes and stigma towards people with epilepsy in an urban setting in Georgia

N. Gzirishvili[1], G. Lomidze[1], I. Toidze[1], S. Kasradze[1], J.W. Sander[2]
[1]Center for Prevention and Control of Epilepsy, Tbilisi, Georgia, [2]UCL Institute of Neurology, London, UK

Aim: To assess the attitude of people with medical and non-medical professional background towards people with epilepsy.
Methods: The study was conducted through a Survey of Public Awareness, Understanding and Attitudes Towards Epilepsy questionnaire. Attitude and perception of epilepsy related stigma were assessed in relation to respondents' professional background, such as medical (physicians, nurses, pharmacists or medical students) and all other professions.
Results: 1,016 respondents (69% females; mean age – 37, SD=14 years) were interviewed through face to face (n=722) or on-line interview (n=294). 10% of the responders had medical, and the remaining responders had a non-medical professional background. 12% of people with a medical background and 14% of the non-medical background were against their children to have any relationship with a child with epilepsy. The majority of respondents from both groups were against their children to marry a person with epilepsy (82% and 79% respectively). 26% of respondents with a medical and 19% with non-medical background consider epilepsy as mental illness.
Conclusion: Epilepsy is a rather stigmatized condition in Georgia. In some cases the attitude of medical professionals is more stigmatizing than that of other representatives. This underlines the importance of steering the educational activity on the psycho-social aspects of epilepsy, especially among medical professionals, which could be one of the major sources of the epilepsy related stigmata in Georgia.

P2293

Effect of add-on levetiracetam in children with intractable partial seizures

S. Chung
Paediatric Neurology, Kyung-Hee University, Seoul, South Korea

Objectives: To investigate the effects of add-on levetiracetam in children with intractable partial seizures (with or without secondary generalization).
Method: 52 children (33 male, 19 female; 8-20 years old with a mean of 15.2 years) who had 3 or more partial seizures/month in the last 6 months, however, treated with at least 2 antiepileptic drugs were included in this study. To all of them Levetiracetam was added without modifying the present antiepileptic drugs. The starting dose was 10-15mg/kg/day with 1-week increments up to 3,000 mg/day. Efficacy evaluation was assessed by seizure frequency after. 24 weeks add-on treatment (following 4-6 weeks titration periods). 40 (76.93%) patients were idiopathic and 12 patients (23.1%) were cryptogenic and/or symptomatic.
Results: Retention rate was 90.1% (47/52) after 24 weeks on a median dose of 25.8mg/kg/day. One patient of idiopathic and 4 patients of cryptogenic/symptomatic were lost. Overall, seizure-free were 31 out of 47 (66.0%), a seizure reduction over 50% had 8 (17.0%), and less than 50% or unchanged in seizure frequency had 8 (17.0%). By etiology, seizure-free were 74.4% in idiopathic and 25% in cryptogenic/ symptomatic, less than with 50% reduction or unchanged in frequency were 10.2% (4/39), and 50% (4/8) Adverse effects were reported in 11 patients, and most of the side effects were mild.
Conclusion: Add-on levetiracetam treatment in children with refractory partial seizure is highly effective, the good efficacy was in cryptogenic, and the poor effectiveness was in cryptogenic/symptomatic.

P2294

Convulsive status epilepticus as initial manifestation of posterior reversible encephalopathy syndrome (PRES) following sunitinib malate for renal cell carcinoma patients

S.Y. Cho, Y.H. Park, H.J. Yang, S.J. Kim, S.H. Park
Department of Neurology, Seoul National University Bundang Hospital, Gyeonggi, Republic of Korea

Background: Sunitinib malate (Sutent) is a receptor tyrosine kinase inhibitor with potent antiangiogenic activity, which is recommended for patients with advanced renal cell carcinoma. To our knowledge, this case is the first report of sunitinib-induced posterior reversible encephalopathy syndrome with convulsive status epilepticus as initial manifestation.
Case: A 58-year-old man who had been treated with sunitinib for metastatic renal cell carcinoma was hospitalized for generalized tonic-clonic seizures followed by prolonged unconsciousness. A brain MRI revealed ill-defined oedematous abnormal signal intensity involving both occipitotemporal lobes, which is compatible with posterior reversible encephalopathy syndrome. There was no evidence of stroke or brain metastasis. The electro-encephalogram (EEG) confirmed the diagnosis of status epilepticus with occipital foci. The epileptic discharges were significantly reduced after the infusion of intravenous midazolam.
Conclusion: Posterior reversible encephalopathy syndrome initially presenting as convulsive status epilepticus seems to be a rare complication of the chemotherapy with sunitinib for advanced renal cell carcinoma patients. It should be suspected in cancer patients under sunitinib chemotherapy at continuous or recurrent seizures without return to baseline function between the seizures.
Keywords: Renal cell cancer, Sunitinib malate, Status epilepticus, Posterior reversible encephalopathy syndrome (PRES), Magnetic resonance imaging

P2295

Education of children with epilepsy in Poland: results from PRO-Epi survey study

I. Bechyne[1], M. Balcerzak[1], J. Wendorff[2,3], J. Jędrzejczak[3,4]
[1]UCB Pharma, Medical Affairs Department, Warsaw, [2]Department of Neurology, Institute Polish Mother's Memorial Hospital, Lodz, [3]Polish Society of Epileptology, [4]Department of Neurology and Epileptology, Medical Centre for Postgraduate Education, Warsaw, Poland

Introduction: Children with epilepsy are at risk of social isolation. Attending special schools or individual education programs, despite lack of contraindications, may contribute to further social discrimination.
Methods: The PRO-Epi survey study was initiated by the Polish Society of Epileptology and UCB Pharma to investigate the facilitation of primary education system by children with epilepsy in Poland. Polish citizens (n=1,042), parents of children with epilepsy (n=313), school principals (n=200) and neurologists (n=179) were interviewed to describe the magnitude of the problem and to identify social factors associated with the reluctance of children with epilepsy from the ordinary schools.
Results: Although most physicians (60%) and school principals (69%) agree that the ordinary school is the best choice for children with epilepsy, willingness of ordinary schools to admit these children, in the opinion of parents and physicians, is low (26% and 16%, respectively). According to the parents of children with epilepsy, the main reasons for this reluctance are teachers' fear of seizures and their inadequate knowledge about epilepsy. 43% of parents choose for their children other education options than ordinary schools. Except for unarguable medical reasons, this decision is affected by social factors such as fear of classmates' attitude (25%), stress avoidance (22%), other children's exposure to witnessing a seizure (10%) and previously experienced school principals' reluctance (26%).
Conclusions: This situation can be changed by proper education of the Polish society in general and school teachers in particular. It would improve the understanding of young patients living with epilepsy and their parents.

P2296

What are the concerns of people with epilepsy? A qualitative survey of patients' and health caregivers' view

A.-C. Héritier Barras, M. Seeck
University Hospitals of Geneva, Geneva, Switzerland

Purpose: To explore the concerns of patients with epilepsy, to compare to those of health caregivers', before proposing an adapted educational program.
Method: Qualitative survey with semi-structured recorded interviews of focus group (FG). Analysis (winmax software) according to a framework approach in 5 steps: 1) Familiarisation: listening to tapes, transcriptions ad verbatim 2) Identifying a thematic framework of concepts 3) Indexing: annotating the transcripts with codes, comparing between themes 4) Charting: rearranging the codes in categories 5) Mapping and interpretation.
Results: We analyzed six FG from 3 to 5 persons: 4 patients' FG and 2 health caregivers' FG. Four categories of concerns were identified: 1) impact of epilepsy on daily life (seizure consequences, side effects of medication, restrictions for driving, working or leisure), 2) disease related or medical aspects (evolution of the disease, comprehension of the aetiology, treatment) 3) negative emotions (anticipatory anxiety of seizures, shame, frustration, loss of control) 4) social aspects (other people's opinion, speaking about the disease, stigmatisation).
Discussion: In comparison with the patients, the caregivers underestimated the emotional stress and the burden of the disease on their patients' social life (concern 3 and 4). In contrast, the concerns of the health professionals reflected their proper preoccupations: impact of seizures on daily life, treatment tolerance, knowledge of the evolution or therapy (concern 1 and 2).
Conclusion: Health caregivers' concerns differ from patients' concerns in regard to epilepsy. In order to develop a successful educational program, the professionals need to explore and integrate the patients' true concerns.

P2297

How to treat epilepsy when anticonvulsant hypersensitivity syndrome occurs and liver and kidney fail?

X. Rodriguez Osorio[1], J. Pardo Fernández[1], A. López Ferreiro[1], J. Pías Peleteiro[1], F.J. López González[1], E. Corredera García[1], D. Novoa García[2], E. Pintos Martínez[3]
[1]Neurology, [2]Nephrology, [3]Pathology, Hospital Clinico Universitario, University of Santiago de Compostela, Santiago de Compostela, Spain

Introduction: Anticonvulsant hypersensitivity syndrome (AHS) is a rare condition usually caused by an adverse drug reaction after 1-8 weeks of exposure to antiepileptic drugs (AEDs) and it can threaten life by affecting liver, kidneys lungs or central nervous system. We present a patient developing AHS after 10 years of treatment with lamotrigine and phenytoin.
Case report: Our patient is a 47-year-old man having focal cryptogenic epilepsy. He received 200mg of lamotrigine and 200mg of phenytoin daily, without any other drug-taking in the previous months. He developed an acute episode of nausea, vomiting and renal pain associated to oliguria. Blood tests showed severe renal insufficiency (creatinine 8.4mg/dl) and liver failure (AST 152 UI/L, ALT 1774 UI/L, GGT 416 UI/L and phosphatase alkaline 285 UI/L). AED levels, abdominal ultrasound and immunological tests were normal. As renal and hepatic function worsened in 24 hours and AEDs were needed, a renal biopsy was performed.
Results: Pathology diagnosed an acute interstitial allergic nephritis induced by medication. Treatment included replacement of phenytoin and lamotrigine by levetiracetam 250mg every 12 hours with favourable response. Haemodialysis was required and corticoid treatment also started. In two weeks renal and liver function were normal and no seizures occurred after 1 year of follow-up.
Conclusions: Despite it is not common, AHS can appear after years of exposure to AEDs and an early diagnosis helps to get a complete recovery. When liver and kidney are highly affected, levetiracetam is an excellent option to treat epilepsy.

P2298

Ketogenic diet in refractory epilepsy in children

E. Jamroz[1], J. Paprocka[1], E. Kołodziej[2], D. Klimek[2]
[1]Child Neurology Department, Silesian Medical University, [2]Child Neurology Department, Student's Scientific Society, Silesian Medical University, Katowice, Poland

Background: Despite the progress that has taken place in pharmacological and neurosurgical treatment of epilepsy, refractoriness may occur in 30-35% of children with epilepsy. In the treatment of refractory epilepsy the other methods are useful, among them ketogenic diet. Detailed mechanism of ketogenic diet action is not known. It is proposed that due to ketosis in CNS, hyperpolarisation of cellular membranes, reducing the process of transamination and desamination of glutamine, increased turnover of glutamate to GABA, increased endogeneous level of CRH and cortisol is taking place.
Purpose and methods: The purpose of the study was to evaluate the efficacy of ketogenic diet in a group of 40 children of age between 2 and 18 years (x=11.2 years) with focal (n=28; 70%) and generalized (n=12; 30%) epilepsy. Symptomatic epilepsy was recognized in 17 (48.6%) children. Mean duration of epilepsy was about 6.35 years. The mean frequency of seizures before the initiation of ketogenic diet was between 5 and 20 per day. Children were receiving 2 to 4 antiepileptic drugs.
Results: The patients received ketogenic diet for a period of 2 to 36 months. A >50% decrease in seizure frequency was observed in 27 (67.5%) children, including 5 (32.5%) patients who became seizure free. 28 children discontinued the diet because of increased frequency of seizures and/or parental lack of acceptance of the diet and/or adverse effects.
Conclusions: A strict ketogenic diet may be an effective alternative treatment for children with refractory epilepsy.

P2299

The evaluation of brainstem evoked potentials and balance and coordination tests of epileptic patients using carbamazepin, valproate and levetiracetam

P. Ce, F. Yildirim, M. Gedizlioglu
Bozyaka Izmir Training and Research Hospital, Izmir, Turkey

Aim: It is known that classical antiepileptic medication (AEM) has permanent effects on balance and coordination. There are no data on the effects of the new generation AEM. The aim of this study is to evaluate the toxic effects of new generation antiepileptic LEV, and the old generation antiepileptics VLP and CBZ on balance and coordination.
Material and methods: 25 patients taking VLP, 25 patients taking CBZ, and 25 patients taking LEV and 25 healthy volunteers participated in this study attending our epilepsy outpatient clinic. Brainstem auditory evoked potentials (BAEP) examination and Berg Balance tests were performed. The difference between the groups was evaluated statistically.
Results: The age and gender of the control and patients groups were similar (p=0.07, p=0.56). There was no difference between the control and patient groups on BAEP parameters of I-III wave latency, III-V latency and I-V latency (p=0.36; p= 0.83; p= 0.33; p= 0.46; p=0.36; p=0.32). Berg Balance test was also similar between the two groups.
Discussion: In this study it is determined that LEV, CBZ and VLP have no effect on BAEP parameters and balance function. As there are a few studies on balance, our study carries a considerable value. However, more studies are needed on bigger patient groups in order to establish the effects of antiepileptic medication on balance.

P2300

Combination of vagal nerve stimulator and cardiac pace-maker

E. Mentesidou[1], J. Richter[2], P. Vigren[2], K. Säfström[3], A.-M. Landtblom[4]
[1]Neurology Clinic, [2]Neurosurgery Clinic, University Hospital, [3]Cardiology Clinic, University Hospital, [4]Dpt of Neuroscience, Div of Neurology, Medical Faculty, Linköping, Sweden

Background: Cardiac symptoms, especially arrhythmias, are frequently reported in epilepsy. They may be dangerous, even life threatening, for example AV-block III or cardiac arrest. Such symptoms are often discussed in relation to SUDEP, sudden death in epilepsy, although the pathogenetic mechanism of this fatal diagnosis is not fully clear. High risk patients regarding SUDEP are receiving polypharmaceutical treatment and in spite of this they are suffering from insufficient seizure control – they are furthermore often in evaluation for surgical treatment. Today vagal nerve stimulator (VNS) is an increasingly used method when surgery is not possible. This implicates that this special high risk epilepsy patient group may encounter both VNS treatment and also is at risk needing of a cardiac pace-maker.
Patients and method: We have made VNS implants in two persons with severe epilepsy, who also already had a cardiac pacemaker.
Results: The devices were tested for interference in the operating room and no abnormalities were found. Follow ups in both patients have not revealed any harmful effects.
Conclusion: It is reasonable to conclude that VNS therapy can be tried together with a pacemaker, at least if the pacemaker leads are of the less sensitive bipolar type. The combination must be used with great caution and close monitoring. We look forward to reports from other investigators with similar experiences.

P2301

Ten-year mortality among people with epilepsy (PWE) at a primary health care level: the case of the Mbam area of Cameroon

J.Y. Fonsah[1], R. Nchufor[2], R. Nditanchou[2], Y.F. Fogoum[1], A. Acho[1], R. Doh[1], F. Dema[1], E.N. Tabah[3], V. Sini[1], A.-C.Z.-K. Bissek[2], W.F.T. Muna[2], A.K. Njamnshi[3]
[1]Neurology Unit, Central Hospital Yaounde, [2]FMBS, University of Yaounde I, [3]Neurology Unit, Central Hospital Yaounde/ Ministry of Public Health, Yaounde, Cameroon

Introduction: In Cameroon, the Mbam valley is reported to have one of the highest epilepsy prevalence rates ranging from 11.6 per thousand in Yebekolo village to about 60.5 per thousand in Badissa village. A study on the mortality amongst PWE in this area 10 years ago showed a 6-fold increase compared to the general population.
Aim: To contribute to the improvement of epilepsy care in PWE and understand the natural history of epilepsy in Cameroon. More specifically, to determine the mortality and its principal causes in a group of PWE in the Mbam area of Cameroon.
Methods: A retrospective analysis of all case files diagnosed with epilepsy from 1999 to 2000 in the Mbam area was done. A total of 820 files of patients followed-up in an existing, community-dependent, nurse-controlled and neurologist-supervised missionary epilepsy programme were studied, amongst which 192 were analysed.
Results: A mortality rate of 15.1% was obtained with an SMR of 8.9. More deaths were recorded amongst females (65.5%) and people of the age group 16-25 years (73.2%). Most people had lived with the epileptic condition for 11-15 years (42%) before dying with a mean duration of illness of 11.65 years. Bilomo and Badissa alone recorded more than 50% of all deaths. The main causes of death were status epilepticus (42.3%), drowning (23.1%) and sudden unexplained death (7.7%).
Conclusions: The mortality amongst PWE is high in the Mbam area and involves more females and youths. Status epilepticus and drowning are common causes of death.

P2302

The comparison of auditory event related potentials with neuropsychological tests in Juvenile Myoclonic Epilepsy (JME)

F. Mayda Domaç, T. Adıgüzel, H. Mısırlı
Department of 1st Neurology, Haydarpaşa Numune Training and Research Hospital, Üsküdar, Istanbul, Turkey

Object: We aimed to examine whether JME is associated with cognitive efficiency, if so, to correlate the neuropsychological tests of attention, memory, language, cognitive efficiency and visuospatial abilities with the latencies of N1, P2, N2 and P3 and the amplitudes of N1-P2 and N2-P3 recorded on auditory event-related potentials (ERP).
Material: 29 patients with the diagnosis of JME (18 female, 11 male), age ranged between 14-26 and 23 controls with the similar age and educational state were included in the study. Auditory ERP and neurophysiological battery were applied for both JME patients and controls. Patients with mental retardation, deafness or depression who were examined by Beck depression inventory were excluded.
Results: JME group had significantly longer latencies for N1 ($p=0.000$), P2 ($p=0.000$), N2 ($p=0.000$) and P3 ($p=0.000$) waves and lower amplitudes of N1-P2 and N2-P3 ($p=0.000$) recorded by Fz, Cz, and Pz electrodes when compared with the control group. The scores of attention, memory, language, cognitive efficiency, and verbal paired associates in the migraine group were significantly lower compared with the control group ($p=0.000$) and there was a negative correlation between the cognitive tests and the latencies of PzP2, PzN2 and PzP3 ($p<0.05$).
Conclusion: Cognitive function is affected in JME. ERP supports the cognitive impairment in JME that has been observed by the neuropsychological tests. Though ERP is not a major test for the diagnosis of epilepsy, it is an easily applied non-invasive technique and important for the follow-up of the cognitive abilities and response to the treatment.

P2303

Intellectual impairment in patients with epilepsy in Ile – Ife, Nigeria

T.A. Sunmonu[1], M.A. Komolafe[2], O.A. Ogunrin[3], B.Y. Oladimeji[4], A. Ogunniyi[5]
[1]Medicine, Federal Medical Centre, Owo, [2]Medicine, Obafemi Awolowo University Teaching Hospital Complex, Ile – Ife, [3]Medicine, University of Benin Teaching Hospital, Benin City, [4]Clinical Psychology, Obafemi Awolowo University Teaching Hospital Complex, Ile – Ife, [5]Medicine, University College Hospital, Ibadan, Nigeria

Introduction: Epilepsy is the most common non-infectious neurological disease in developing countries in Africa.
Objectives: This study was designed to assess the intellectual performance of patients with epilepsy (PWE) in Nigeria hoping that the result will serve as the basis for educational, vocational and social counselling.
Methods: 41 PWE were studied along with 41 age, sex- and education-matched healthy controls. A questionnaire was developed and applied to all subjects and history was taken from patients and eyewitnesses. The intellectual function of each subject was assessed with the aid of Wechsler Adult Intelligence Scale adapted for Nigerians. All patients subsequently had electroencephalography (EEG) performed and the EEG findings were noted. SPSS statistics package was used to analyze the data.
Results: The PWE performed poorly on the verbal IQ, performance IQ, and full scale IQ scores when compared with controls ($p<0.05$) and 20% of PWE had mental retardation. Long duration of epilepsy, long duration of antiepileptic drug therapy, younger age at onset of epilepsy, increased frequency of seizures, and low educational status were found to have negative impacts on intellectual performance in PWE ($p<0.05$) while seizure types and type of antiepileptic drugs (carbamazepine or phenytoin) did not influence intellectual performance.
Conclusion: This study showed that PWE had significant intellectual impairment when compared with controls. In addition, long duration of epilepsy, long duration of AED therapy, earlier age of onset, increased seizure frequency and low educational status had a negative impact on intellectual functioning in PWE.

P2304

Peculiarities of attention disorders in patients with post-traumatic epilepsy

G.S. Rakhimbaeva[1], N.M. Mukhamedjanova[1,2], F.H. Muratov[1,3]
[1]Neurology, Tashkent Medical Academy, Tashkent, [2]Neurology, Tashkent Medical Academy, Keles, [3]Neurophysiology, Tashkent Medical Academy, Tashkent, Uzbekistan

Aim: To study peculiarities of attention disorders in patients with post-traumatic epilepsy (PE) depending on the level of mental disorders, remoteness of the disease and frequency of the attacks.
Methods: 90 patients have been studied: 45 patients with PE (average age 34.6±1.4 years), 45 patients with traumatic disease of the brain (31.8±1.4 years). MMSE test was used for detecting the level of mental disorders, method of finding numbers by Shulte tables for assessing attention volume and the velocity of sensomotor reactions.
Results: According to MMSE test in patients with PE a slight rate of dimension has been observed most often (44.4%); the signs of non-dementia mental disorders were found in 11 patients; moderate dementia was observed in 7 patients; heavy dementia was found in 1 case; 6 patients with PE had no mental disorders. The signs of non-demential mental disorders have been observed most often in the comparison group. There were no cases of heavy dementia. Illness up to 5 years was found in 24.4%, 35.5%-over years long, 37.7% -over 10 years long. The exponents of attention became better with each following table in patients with PE without any mental disorders but they spent more time than comparison group patients. With deterioration of mental disorders the signs of fast exhaustion were observed. All patients with heavy dementia could not perform any task.
Conclusion: Attention disorders in PE depend on remoteness of the disease, frequency of the attacks, mental disorders level and are characterized by fast exhaustion and decrease of attention volume.

P2305

Cardiovascular disorders in epileptic patients in the inter-fit period

G. Bahtiyar Gafurov[1], N. Abdurakhmanova[2]
[1]Institute for Advanced Training of Doctors, [2]Tashkent Institute for Advanced Training of Doctors, Tashkent, Uzbekistan

Materials and methods: Cardiovascular complications are known to be most dangerous, in terms of the vital prognosis, among somatic complications of epilepsy. We have examined 51 epileptic patients (age 16-42) with the purpose to analyse the frequency and the structure of cardiovascular complications. All the patients were put under diurnal monitoring of ECG, EEG; and also examined was the condition of their vegetative nervous system.
Outcomes: In 24 patients (47.05%) the diurnal ECG monitoring has revealed disorders of cardial conduction of the heterotopia type, also various forms of blockades and paroxysmal tachy- and bradyarhythmia. Comparing to the control group, the disorders of the cardiac rhythm were 5 times as frequent, than with the epileptic patients. It was established that those disorders are dominant with symptomatic forms of epilepsy and with localization of the focus in the temporal lobe. The connection was determined between the rhythm disorders by epileptic patients and the condition of the vegetative tonus.
Conclusion: When doing examination of epileptic patients, it seems necessary to carry out diurnal ECG monitoring and to investigate of the condition of the vegetative regulation.

P2306

Seizures and brain tumour surgery

D. Ndoja[1], A. Xhumari[2], M. Petrela[2]
[1]UHC 'Mother Theresa', Service of Neurology, [2]UHC 'Mother Theresa', Service of Neurosurgery, Tirana, Albania

Background: Seizures are generally considered a symptom of brain tumour and different studies investigate the prevalence of seizures in brain tumours. The aim was to estimate the prevalence of inaugural seizures (ILAE 1981) in brain tumour lesion (WHO 2005). The relationship between seizures, the nature of tumour, and tumour localization was also investigated.
Materials and methods: We studied retrospectively 58 patients operated in our service for a period of 3 months. The mean age of those was 49.5 years. 31% were females, 69% were male. 14% of them were operated for different cause than TU surgery, 86% had brain TU surgery. 60% of brain tumour surgery patients had seizures, but 40% had not inaugural seizures. Between seizure patients were 37% secondary generalized seizures, 31% had complex partial, 20% partial motor, 12% partial sensory seizures. The kind of tumour which evoked inaugural seizures was: 51% glial, 42% meningeal tumours, 5% ependimoma, 2% craniofaringeoma. According to the localization 26% had temporal, 22% frontal, 12% parietal, 10% T-P junction, 4% occipital tumours, and 16% tumour located in other parts of the brain.
Conclusion: The highest prevalence of inaugural seizures was in glial not in meningeal tumours. The most frequent type of seizures were SGTC, compared to PS and CPS . There was no correlation between the type of seizures and the nature of brain tumour. The highest prevalence of seizures was in the temporal, followed by the frontal, parietal, and finally by the occipital lobe tumours.

P2307

Peculiarities of clinical and functional state of brain in vascular epilepsy patients

T. Danilova[1], D. Khasanova[2], I. Kamalov[1], Z. Latypova[3]
[1]Neurology, Interregional Clinical-diagnostic Centre, Kazan State Medical University, [2]Neurology, Kazan State Medical University, [3]Neurology, Kazan Clinical Hospital №9, Kazan, Russia

A total of 446 patients with ischemic lesions of brain were under integral medical supervision. 244 patients experienced epileptic seizures (56.6% had strokes, 43.4% – a chronic ischemia of brain). The 202 patients of the control group with ischemic lesions of brain experienced no epileptic seizures and were integrally examined. The diagnostic complex comprised clinical analysis and instrumental diagnostics methods: magnetic resonance imaging (MRI), electroencephalography (EEG), extracranial and transcranial Doppler sonography. The focal seizures predominated (89.7%, $p<0.01$) EEG revealed focal epileptiform and slow-wave activity in 53.8% patients. These focal dischargers were more frequently registered in left hemisphere of brain (57.3%) as compared to the right hemisphere (36.6%) with prevalence in the temporal region (60%) ($p<0.001$). With MRI ischemic lesions predominated in temporal (34.9%) and parietal (48.6%) lobes in the main group as compared to the control group (20.5% in temporal, 25.4% in partietal lobes). The cortical involvement of ischemic damage prevailed in patients with seizures (71.6%), whereas patients in the control group manifested 45.8%. Reduction of cerebral perfusion in vertebo-basilar basin in patients with ischemic brain disease who experienced epileptic seizures prevailed (73.7%) over that in the carotid basin (57.2%). The cerebrovascular reactivity in patients of the control group was frequently reduced in the carotid basin (74.9%) as compared with vertebro-basilar basin (63.6%). Thus, in patients with epileptic seizures due to cerebral ischemia predominance of focal epileptic seizures, the more frequent left location of pathologic activity as seen on EEG, preferrention perfusion reserve reduction in the vertebro-basilar basin, were observed.

P2308

Insular epilepsy: a case report

V. Weiss, R. Mařák, D. Franc, R. Herzig, P. Kaňovský
Department of Neurology, Faculty of Medicine and Dentistry, Palacký University and University Hospital, Olomouc, Czech Republic

Introduction: The ictal signs associated with an insular seizure are very similar to those usually attributed to mesial temporal lobe seizures. It is estimated that 10% of the subjects with a diagnosis of temporal epilepsy suffer from insular epilepsy.
Case report: A 78-year-old female was admitted due to repeated unconsciousness with vomiting and eyes deviation to the left side, lasting for 10 seconds. The patient reported sensation of laryngeal constriction, nausea, and epigastric discomfort preceding the seizure. Second degree right side nystagmus was present for 15 minutes after a seizure. The same type of seizure occurred 5 times during the last 10 years. Initial electroencephalogram (EEG) was normal. EEG after sleep deprivation showed sharp waves localized in the left frontotemporal region. No seizure occurred during 14-day video-EEG monitoring. Brain magnetic resonance imaging revealed mild hippocampal atrophy. Interictal 18[F]fluorodeoxyglucose positron emission tomography (PET) scan demonstrated glucose hypometabolism in both temporopolar regions, but normal findings in both hippocampi. Electrocardiogram and cardiologic examination were normal. Based on the clinical manifestation of seizures and PET findings, the diagnosis of insular epilepsy was considered, although mesiotemporal epilepsy should also be included in the differential diagnosis.
Conclusion: Diagnostics of insular epilepsy is complicated. Sphenoidal electrodes are currently the only method with adequate temporal resolution to define insular seizures. In the reported case, sphenoid electrodes monitoring was not performed due to the low frequency of seizures.

P2309

Efficacy of treatment of post-stroke epilepsy

E. Isakova, A. Kotov
Department of Neurology, M.F.Vladimirsky Moscow Regional Clinical and Research Institute, Moscow, Russia

Objective: To study the treatment efficacy in patients with post-stroke epilepsy (PSE).
Methods: There were 31 PSE patients who had ischemic (26) or hemorrhagic (5) stroke. Observation included history, clinical and neurologic examination, laboratory analyses, EEG, and MRI. Carbamazepine was taken by 12 patients, valproates by 7, topiramate by 3, combination of these drugs by 7, and other drugs by 2.
Results: Symptomatic temporal E was diagnosed in 10 patients (32.3%), frontal E in 9 (29%), occipital E in 1 (3.2%), parietal E in 1 (3.2%), and E of unclear localization in 10 patients (32.3%). Marked cognitive defects were recorded in 8 (25.8%) patients. Secondary generalized seizures were noted in 16 (51.6%), partial ones in 4 (12.9%), combination of the two in 11 (35.4%). Incompliance was revealed in 13 patients (41.9%). Remission was observed in 10 of 18 compliant patients, incidence decrease by 50% or more in 5, and absence of the effect in 3. Remission was reliably achieved in patients with a short duration of the disease, with attacks less than once per month, with the secondary generalized seizures, and with absence of cognitive defects ($p<0.05$). Reliable differences in efficacy between carbamazepine, valproates, and topiramate were not found.
Conclusion: PSE treatment efficacy exceeded 50% in condition of the patient compliance. Reliable remission was more often achieved in patients with rare secondary generalized seizures, short duration of the disease, and cognitive defects absence.

P2310

Symptomatic epileptic seizures in patients with different causes of brain injury

S. Atic, P. Nikic
Hospital for Cerebrovascular Diseases 'Sveti Sava', Belgrade, Serbia

Background: Symptomatic epileptic seizures (SES) represent a difficult problem. The purpose of our study was to compare the frequency of epileptic seizures in patients with different causes of the brain injury.
Methods: We studied patients with different causes of brain injury admitted to our hospital using a standard protocol including neurological examination, EEG, brain CT and/or MRI.
Results: 110 patients were observed, 56 female and 54 male, age range 39 to 84. Among these patients SES was an initial sign in 55 (73.3%) from 75 stroke patients (28 or 70% from 40 patients with ischaemic and 27 or 77.1% from 35 with haemorrhagic stroke), in 5 (50%) from 10 with SAH, 5 (33.3%) from 15 with cerebral tumours, 3 (60%) from 5 with brain injury and 3 (60%) from 5 with CNS infections. Simple focal seizures were observed in 40 patients (56.3%), complex focal in 21 (29,5%), secondarily generalized in 7 (9.85% 0 and 3 (4.22%) patients had generalized seizures.
Conclusions:
1. Among the patients with stroke, frequency of epileptic seizures was higher than in patients with other causes of brain injury. The frequencies were nearly similar in patients with ischaemic and haemorrhagic stroke.
2. The majority of the seizures in patients with different causes of brain injury were focal in onset with or without secondarily generalized.

P2311

Differentiated diagnostis of some non-epileptic seizures

E. Hadjiu[1], S. Hadjiu[2], A. Hadjiu[3], I. Ilciuc[3], C. Calcii[3], L. Cioban[3]
[1]Neurology, State University of Medicine and Pharmacy 'Nicolae Testemitanu', [2]Neurology, State Medical and Pharmaceutical University „N. Testemițanu", [3]Neuropediatrics, The State University of Medicine and Pharmacy "Nicolae Testemițanu", Chisinau, Moldova

Objective: Appreciation of clinical peculiarities in children with critical manifestations to differentiate non-epileptic paroxysmal clinical events from the epileptic ones.
Materials and methods: 387 children with heterogeneous critical manifestations aged between 1 and 16 years were investigated by means of complex neurological examinations and laboratory examinations. Previously, epilepsy was confirmed in all patients.
Results and discussions: Abnormal paroxysmal motor events that might be not discovered as epileptic because of their unusual characteristics were diagnosed in 130 children (33.6%) exposed to the research and constituted: anoxic/hypoxic convulsions – 67.7%, toxic agents-determined paroxysmal strokes – 1.54%, pseudo-epileptic convulsions and other psychiatric manifestations – 3.08%, hyperventilation syndrome – 6.15%, movement's paroxysmal disturbances – 0.77%, other disturbances of movement – 1.54%, episodes characterized by damaging of response to stimuli – 2.31%, migraines and periodical syndromes – 10.76%, paroxysmal disorders during sleep – 6.15%.
Conclusions: Most errors of paroxysmal manifestations' diagnostic may be avoided by the means of a meticulous anamnesis, which remains the major step in diagnostic establishment. The second step of diagnostics is the objective examination, to which we add laboratory examinations, adjusted to each case, which constitutes the third step of diagnostic and leads to the differentiation of epilepsy from other non-epileptic paroxysms. The misinterpretation of EEG or its interpretation without taking into consideration the case history, represents a source of error to epilepsy diagnostic. Less frequently, another way round error consists in excluding the epilepsy basing the diagnostic on a normal EEG.

P2312

Electroencephalography in patients with pineal gland cyst and epilepsy

J. Bosnjak, S. Miskov, H. Hecimovic, V. Demarin
Department of Neurology, University Hospital 'Sestre Milosrdnice', Zabreb, Croatia

Objective: Pineal gland cyst can cause various clinical implications. The most common symptoms include: headache, vertigo, visual and oculomotor disturbances, epilepsy and obstructive hydrocephalus. The aim of this study is to determine EEG (electroencephalography) changes in patients with pineal gland cyst, focusing primarily on those patients with epilepsy as presenting symptom.
Methods: We analyzed prospectively 75 patients (50 female, 25 male, mean age 26.3±15.7 and 25.6±17.6 years, respectively) with pineal gland cyst detected on MR of the brain due to various neurological symptoms. In patients with epilepsy, pineal gland cysts varied in size from 10x9x5mm to 21x17x15mm.
Results: Epilepsy was the presenting symptom in 28 of 75 patients. Complex partial seizures were present in 10 patients, generalized convulsive seizures in 9 patients, secondarily generalized partial seizures in 5 and absence seizures in 4 patients. In 19 patients with epilepsy EEG showed: focal spikes or biphasic spikes, spike and wave complex 6-7Hz focally or diffuse paroxysmal discharges, spike and wave complex 3-4Hz focally or diffuse paroxysmal discharges, whereas the remaining had non-specific changes: focal slowing and dysrhythmic changes.
Conclusions: Patients with pineal gland cyst and epilepsy can have abnormal EEG findings. In our patients specific epileptogenic graphoelements were seen in 19 patients with epilepsy as presenting symptom. Other patients may have focal slowing or diffuse disrhythmic discharges. The cause of EEG changes could be: compressive effect of pineal gland cyst on surrounding centrencephalic structures or decreased levels of melatonin which is considered to have an anticonvulsive effect.

P2313

Symptomatic epileptic seizures in stroke

A. Alajbegovic[1], S. Alajbegovic[2], L. Todorovic[3], J. Djelilovic-Vranic[3]
[1]Neurology Clinic, Clinical Center University of Sarajevo, Sarajevo, [2]Department for Diabetes, Cantonal Hospital Zenica, Zenica, [3]Neurology Clinic, Clinical Center Sarajevo, Sarajevo, Bosnia-Herzegovina

Introduction: Epileptic manifestations can occur as sequelae of different types of stroke, and can be early and late sequelae. Epileptic seizures occurring within two weeks from the onset of stroke are early epileptic seizures, while seizures occurring two or more weeks after the stroke are late epileptic seizures.
Aim: To determine the frequency and type of symptomatic epilepsy with regard to a type of stroke in patients treated at the Neurology Clinic, Sarajevo from 2008 to 2009, and etiologic factors of stroke.
Material: Out of 1430 patients hospitalized at the Neurology Clinic, 37 had the diagnosis of stroke and symptomatic epilepsy. A specially designed questionnaire was used. There were 40.54% of males and 59.46% of females. Mean age was 74±11.78 years.
Results: The majority of patients was between 41 and 50 years. The sample contained 10.81% of haemorrhages, 35.14% of embolisms, and 54.05% of thromboses. Generalized seizures occurred in 89.19% (54.55% partial seizures with generalization). 64.86% were late seizures, and 35.14 early seizures. The most frequently used antiepileptic was carbamazepin (54.05%), then valproat (21.05%), and lamotrigine (11.5%) as add on.
Conclusion: There were 2.87% of patients with stroke and symptomatic epilepsy. Mean age was 74±11.78 years. The most frequent risk factors were arteriosclerosis (83.78%), hypertension (75.68%). Symptomatic epilepsy was more frequent in patients with ischemic stroke (89.19%). The most frequent type of epileptic seizures was partial late seizures with generalization (54.55%). There were significantly more patients with early seizures (64.86%). Late seizures most frequently occurred within a year after stroke (38.46%).

P2314

The effect of hemispheric epileptic focuses on the autonomic nervous system in epileptic patients

M.S. Berilgen[1], A. Tekatas[2], S. Bulut[1], B. Müngen[1], C.F. Demir[1]
[1]Neurology, [2]Firat University, Elazig, Turkey

Some autonomic signs are defined during the epileptic attack. There is some evidence that shows the existence of different effects of the right and left hemispheres on the cardio-vascular system. In this study, it was investigated whether the epileptogenic focus has effects or not, which shows hemispheric lateralization, on the sympathetic and parasympathetic functions. 17 patients with epileptic activity in the right hemisphere and 18 patients with epileptic activity in the left hemisphere in respect of electroencephalography (EEG) and a total of 20 healthy volunteers were included in the study. R-R interval variation (RRIV) and sympathetic skin response (SSR) were applied in these groups as the autonomic nervous system function test. When the right localized patients and control group were compared with the hand latency as a SSR measurement, extending latencies were found and this was also statistically meaningful ($p<0.05$). When we compared the hand amplitudes of the right localized patients and control group, higher and statistically meaningful hand amplitudes were found in the control group ($p<0.05$). When comparing the left localized patients with the control group, RRIV values of the left localized patients were lower than the control group and statistically significant ($p<0.05$). RRIV values of the both patient groups were lower than the control group. SSR latency value of the upper extremity was found as extended in the patients with right hemispheric epileptic activity.

P2315

Pattern reversal visual evoked potentials in the interictal and postictal periods in cases with epileptic seizures and non-epileptic psychogenic seizures

M.S. Berilgen[1], F. Sürgün[2], B. Müngen[1], S. Bulut[1]
[1]Neurology, [2]Firat University, Elazig, Turkey

There may be problems in the discrimination between epileptic seizures (ES) and non-epileptic psychogenic seizures (NEPS). Reliable and novel methods are needed in the differential diagnosis. We examined the Visual Evoked Potentials (VEPs) in the interictal and postictal periods of patients with ES and NEPS. We found that left eye P100 wave latencies in the interictal period of patients with ES were statistically significantly prolonged, when compared to the measurements of the interictal period of NEPS patients and the control group ($p<0.05$, $p<0.01$). Interictal period right eye N75-P100 amplitudes of ES patients were significantly lower than interictal period values of NEPS patients ($p<0.05$). There was no significant difference between P100 wave latencies and N75-P100 amplitudes of interictal and postictal periods of the NEPS group. We think that a VEP study conducted in the interictal and postictal periods may not be helpful in the differential diagnosis of ES and NEPS.

P2316

The evolution of clinical and electroencephalographic symptoms in epileptic encephalopathies: Case series

A. Winczewska-Wiktor, M. Zarowski, I. Kaczmarek, B. Steinborn
Department of Developmental Neurology, Poznan University of Medical Sciences, Poznan, Poland

Introduction: Epilepsy is a heterogeneous condition with many aetiologies. Epileptic encephalopathies are characterized by slowing or regression of development that is attributed to interictal epileptiform activity, often becoming more frequent in sleep. Although the epileptic encephalopathies have a profound impact on neurological development, there has been limited progress made in the successful treatment of these disorders.
Case report: We present case series of children with epileptic encephalopathies. Some of them were classified as West syndrome, Lennox-Gastaut syndrome Landau-Kleffner syndrome, Doose syndrome and epilepsy with continuous spike-waves during slow sleep (CSWS). We conducted a retrospective review (10 years between 1999 and 2009) of the complete medical records of ten children referred for evaluation of an epileptic encephalopathy. We followed up these patients and mean follow up time was 5 years. We characterized the clinical manifestation (frequency and semiology of seizures), electroencephalographic (ictal and interictal epileptiform discharges) and neuroimaging findings. The history of antiepileptic medication (including fail and adverse effects) and global assessments of cognitive function pertaining to the epileptic encephalopathies were presented, too.
Conclusions: The epileptic encephalopathies are a group of age-depended epilepsy syndromes sharing the potential for cognitive deterioration. Not only the recurrent clinical and subclinical seizures are potential factors of developmental impairment. The most important factors increasing the risk of encephalopathy include the etiology, AED adverse effects and interictal epileptiform discharges on electroencephalography.

P2317

Late exacerbation of Rasmussen encephalitis with childhood onset

A. Comanescu[1,2], M. Sabau[1,3]
[1]Faculty of Medicine and Pharmacy, University of Oradea, [2]Neurology, Emergency County Hospital, [3]Clinical Hospital of Neuropsychiatry, Oradea, Romania

Objective: Rasmussen encephalitis is a rare childhood disorder of severe epilepsy and progressive neurologic deficit. We present the case of a young woman with intractable focal motor seizures, who had been diagnosed with epilepsy when she was 9 years old, and had been therapeutically controlled until the age of 21.
Case presentation: A 21-year-old woman was admitted for involuntary movements in the right upper limb, which she had continuously for 6 months. She had had partial motor seizures at the age of 9 and had been well on Carbamazepin until she was 15 years old, when she presented episodes of clonic movements in her right leg. Gabapentin and Clonazepam were added on and she was satisfactorily controlled for the next 6 years. At the age of 21, continuous involuntary clonic movements of her right upper limb became intractable. Slight impairment of cortical sensory functions and aphasia were found. MRI disclosed a small left parieto-occipital hyperintense T2 lesion and slight atrophic changes of the whole left hemisphere. Rasmussen encephalitis was diagnosed. For the next 2 years, her seizures were rather satisfactorily controlled on immunosuppressive therapy, but aphasia and muscle atrophy of the right hemibody became obvious.
Conclusion: The clinical onset when 9 years old was followed by a symptom-free interval of 12 years and the diagnosis was not possible until structural atrophic changes and clinical symptoms of neurologic deficit developed later on.

P2318

Abstract cancelled

P2319

Mandibular advancement devices for treatment of epileptic patients with osas

H. Yilmaz[1], N. Yilmaz[2], S. Sari[1], O. Altan[3], H. Ozbalci[3]
[1]Neurology, Celal Bayar, Manisa, [2]Dentist, Private Clinic, Izmir, [3]Section of Epilepsy and Sleep Disorders, Celal Bayar, Manisa, Turkey

Purpose: To identify the effects of using mandibular advancement devices (MADs) for treatment of epileptic patients with obstructive sleep apnoea syndrome (OSAS) and understand how MADs affect sleep characteristics and severity of seizures in epileptic patients with OSAS.
Methods: We retrospectively reviewed the database of our sleep centre to identify patients with both OSAS and epilepsy who were not favourable for continuous positive airway pressure (CPAP) therapy. Recordings were done using a RemLogic software (Embla Systems, Broomfield, USA) which was included a continuous video-EEG monitoring and polysomnography. Control polysomnographies (PSGs) were done after MADs (SomnoGuard 2.0® or SomnoGuard AP®, Airdrie, Canada) application at median interval of 3 months (range: 1-6 months). The effect of MADs on sleep characteristics and severity of seizures was prospectively analyzed.
Results: 41 patients (25 men and 16 women) with OSAS and epilepsy who were not favourable for CPAP therapy were evaluated according to sleep characteristics and severity of seizures. Treatment with MADs was continued with good compliance in 33 patients and led to a significant reduction of AHI, ESS scores and seizure severity in 24 patients.
Conclusions: The use of MADs to manage OSAS can be effective in many cases. Proper selection of patients and optimal management of adverse effects will undoubtedly improve the long-term compliance and effectiveness of MADs. Our data show that MADs application reduces the seizures in the epileptic patients with OSAS and MADs were very important for the reduction of the seizures in the epileptic patients with OSAS.

P2320

Transcranial direct current stimulation as a treatment option in CSWS – preliminary results

E.T. Varga, D. Terney, M. Nikanorova, M. Atkins, H. Hjalgrim, D.S. Jeppesen, L. Sand, S. Beniczky
Department of Neurophysiology and Sleep, Danish Epilepsy Center, Dianalund, Denmark

Introduction: Transcranial direct current stimulation (tDCS) is a non-invasive, safe, painless stimulation technique, offering the possibility to induce prolonged excitability alterations in different cortical areas. Early animal experiments have revealed that cathodal tDCS reduces spontaneous firing rates of cortical cells, by hyperpolarizing the cell body, while anodal stimulation results in the opposite effect. TDCS allows diagnostic and therapeutic use in neurorehabilitation, chronic pain, focal epilepsy and neuropsychiatric disorders.
Continuous Spikes-and-Waves during Slow-wave Sleep (CSWS) is an idiopathic childhood epilepsy characterized by epileptiform activity during sleep, usually related with neurocognitive decline and epileptic seizures. Therapeutic approaches are limited in this condition.
Objective: To detect the possible therapeutic effect of cathodal tDCS due to reduction of the epileptiform activity on the EEG.
Materials and methods: CSWS patients (age>5 years) were recruited (planned 10 patients, already 3 children). Cathodal tDCS was delivered through a pair of rubber electrodes positioned over the epileptogenic focus. Current intensity was 1.0mA; current duration: 20 minutes. For control stimulation we used sham stimulation. The effect of tDCS was measured on EEG, by quantifying the percentage of non-REM sleep containing spike-and-slow-waves by Brain Electrical Source Analysis program. Neuro-psychological tests were performed to evaluate neurocognitive changes.
Results: There was no detectable effect of tDCS on CSWS activity on EEG in two children. Spike-and-slow wave activity disappeared after sham stimulation in the third patient.
Conclusions: tDCS is a non-invasive, painless method, well-tolerated in children with CSWS. Further patients recruitment is needed to draw a reliable conclusion on the efficacy.

P2321

A study of knowledge, attitude, practice towards epilepsy among relatives of epileptic patients in Khartoum State

A.H. Mohmad, A. Sidig, G. Ibrahim, A. Hussein, A.A. Rahman, A. Babikir, F. Yassien, A. Hamad, O. El-Adil, A. Saad, B. Mubark, H.A.A. Eltoum, M.M. Aldar, Y.A. Widaa, E.M. Ahmad
Medicine, Khartoum University, Khartoum, Sudan

People with epilepsy are suffering from a lot of un tolded negative impacts on their lives; due to misunderstanding of the disease and from the associated stigma.
Objectives: The objective of this study is to assess the knowledge, attitude, and practice among relatives of Sudanese epileptic patients seen in Sheik Mohamed Kheir Neurological clinic and Elshaab Teaching Hospital.
Methods: This is a descriptive cross-sectional community based study, 313 respondents were included; the duration of the study; was from November 2008 to June 2009.
Results: Most of the respondents knew the disease, and had witnessed an attack. One third mentioned a brain lesion as the underlying cause of epilepsy. Most of the respondents mentioned loss of consciousness as the major symptom. More than two thirds mentioned that it is not contagious. Most of the respondents claimed that it can be controlled, and two thirds preferred medical treatment. The study revealed that half of the respondents had shown favourable attitudes and practice.
Conclusion: The study revealed that the level of knowledge, attitude, and practice towards epilepsy needs community educational programmes to fill the gaps, and minimize the stigma.

P2322

MR analysis of focal cortical dysplasia

E. Maj[1], A. Rysz[2], E. Matyja[3], A. Cieszanowski[4], A. Marchel[4], M. Gołębiowski[4], O. Rowiński[4]
[1]2nd Department of Clinical Radiology, [2]Department of Neurosurgery, Medical University of Warsaw, [3]Mossakowski Medical Research Institute, Polish Academy of Sciences, [4]Medical University of Warsaw, Warsaw, Poland

Purpose: Focal cortical dysplasia (FCD) represents abnormal neuronal migration, proliferation and differentiation and is one of the most common causes of drug-resistant epilepsy, often affecting children and young adults. Four types of FCD are recognised: IA, IB, 2A, 2B (Taylor type). The aim of this study was to identify and differentiate types of FDC in MR imaging.
Material and method: Retrospective analysis of MR studies of 52 patients, operated due to drug-resistant epilepsy, with histological confirmation of FDC alone or FDC coexisting with hippocampal sclerosis, was performed. Studies were performed on 1.5T scanner using sequences: T1SE (axial, sagittal), T2TSE, FLAIR (axial, coronal), IR (coronal). The study group consisted of 52 patients: 30 women and 22 men (age range: 17-55 years; mean-32). The features defined in literature as typical for FCD were assessed.
Results: The most common type of FDC was 2A (32 patients), type 1A was identified in 9 patients, type 1B in 7, type 2B in 3; and in one coexistence of types 2A and 2B was noted. Hippocampal sclerosis coexisted in 22 cases with FDC: with type 2A in 17, type 1A in 3 and type 1B in 2 patients. Abnormalities were identified on MRI in 41 patients (79%): 26 in type 2A (50%), 8 in type 1A (15%), 5 in type 1B (10%), 2 in type 2B (4%).
Conclusions: MRI is useful in detection of causes of drug-resistant epilepsy. It demonstrates high efficiency in diagnosis of FDC and hippocampal sclerosis.

P2323

Epilepsy – effect on health grounds in all age groups

B. Nurmukhamedov
Tashkent Medical Academy, Tashkent, Uzbekistan

Introduction: Epilepsy is most common among the elderly, yet our understanding of epilepsy in the elderly is based on inferences from studies of younger adults.
Objective: We used data from national and survey databases to examine the impact of epilepsy on patients' perception of health status in adults of all ages.
Material and methods: We compared scores on measures of physical and mental health status for patients in three age groups: young adults (18-39 years), middle-aged adults (40-65 years), and older adults (66 years and older). Because the time since epilepsy onset may influence these outcomes, we compared scores for patients with new-onset epilepsy, chronic epilepsy and no epilepsy, adjusting scores for patient characteristics that may also affect health status. Young adults with new-onset epilepsy reported poor general health and worse mental health, but high levels of physical function and physical activity. Middle-aged patients with epilepsy scored lowest in all domains. While older adults with epilepsy had the lowest scores on measures of physical functioning, once the effects of other disease states were higher than those of middle-aged adults with epilepsy. While older adults had fewer physiological reserves, they appeared most resilient in facing this chronic illness, and middle-aged adults fared the worst. It is possible that social expectations for middle-aged adults make adaptation to epilepsy more difficult than for older adults.
Conclusion: Interventions to improve quality of life among patients with epilepsy should be tailored to age and time since epilepsy onset.

P2324

Awareness, understanding and attitudes towards epilepsy among Iranian ethnic groups

E. Masoudnia
Social Sciences, Yazd University, Yazd, Iran

P2325

Clinical characteristic of anxiety in patients with epilepsy: the state-trait anxiety inventory

H.M. Park, S.H. Kim, S.H. Heo
Neurology, Gachon University Gil Hospital, Inchon, Republic of Korea

P2326

Seizure related injuries in patients with epilepsy

A.P. Doneva[1], K. Pili Kuzeva[1], V. Donev[2]
[1]Department of Neurology, Clinical Hospital Dr.T.Panovski, Bitola, [2]Resbiomed, Skopje, FYRO Macedonia

P2327

Evaluation of lamotrigine adverse events on epileptic patients

H.A. Ebrahimi[1], F. Ebrahimi[2]
[1]Neurology, [2]Kerman University of Medical Sciences, Kerman, Iran

P2328

Abstract cancelled

P2329

Increased insulin receptor expression in anterior temporal neocortex of patients with intractable epilepsy

L. Wang
Department of Neurology, the First Affiliated Hospital of Chongqing Medical University, Chongqing, China

P2330

Abstract cancelled

P2331

The prevalence of epilepsy in the South of Turkey, Adana

H. Bozdemir, M. Balal, K. Aslan
Neurology, Çukurova University School of Medicine, Adana, Turkey

Cognitive neurology 2

P2332

The impact of immune reconstitution on cognitive functions in HIV/AIDS patients on highly active antiretroviral therapy (HAART)

O. Ogunrin[1], Y. Obiabo[2], A. Ogun[3]
[1]Neurology/Internal Medicine, [2]Internal Medicine, University Teaching Hospital, Benin City, [3]Neurology/Internal Medicine, Ogun State University, Sagamu, Nigeria

Introduction: The HIV-1 infections, particularly in the late phase, can be complicated with a range of neurocognitive disorders and behavioural symptoms that become more frequent and severe as the immune system declines and AIDS ensue. The effects of HAART on cognitive performances have not been studied among Nigerians.
Objectives: To determine the effect(s) of HAART and the impact of immune reconstitution on cognitive performances of adult Nigerians with AIDS using the Community Screening Instrument for Dementia (CSID) and the International HIV Dementia Scale (IHDS).
Study design: A prospective longitudinal cohort study.
Patients and methods: 105 HIV- seropositive antiretroviral naïve patients with CD4 count ≤350 cells/ul were recruited and followed up for six to twelve months. Their baseline cognitive performances pre- HAART were assessed and compared with their performances after 6-12 months on HAART using IHDS and CSID.
Results: The mean CD4 count of the patients on HAART (263.43±148.80) increased significantly above the pre-HAART mean score of 136.25±85.65 ($p<0.0001$) but this did not correlate with rise in IHDS scores while on HAART ($p=0.49$). Similarly the mean CSID scores did not correlate with the CD4 count increase ($p=0.39$). The mean CSID scores were better on HAART ($p<0.001$). The mean pre-HAART IHDS score of the patients was significantly lower than mean post-HAART IHDS score ($p=0.007$).
Conclusion: Significant cognitive impairments are associated with HIV/AIDS. Though HAART significantly improves cognitive performances in adults with HIV/AIDS, immune reconstitution did not correlate with cognitive improvement.

P2333

Does multiple sclerosis selectively slow down attentional processes?

G. Lubrini[1], C. Oreja-Guevara[1], J.A. Periañez Morales[2,3], M. Ríos Lago[2,4], R. Viejo Sobera[3], J. Álvarez-Linera[2,5], E. Diez-Tejedor[1]
[1]Neurology, University Hospital La Paz, [2]Neuroimaging, Research Unit Proyecto Alzheimer Fundación Reina Sofia, [3]Basic Psychology, UCM, [4]Basic Psychology, UNED, [5]Neuroradiology, International Ruber Hospital, Madrid, Spain

Introduction: Prior findings suggest that attentional deficits in MS may be accounted in terms of slowness of information processing.
Objectives: To determine the extent to which Visual Search (VS) and/or Interference Control (IC) impairment account for MS patients' performance in a novel RT attentional task once speed of information processing was controlled for.
Methods: A Visual Search Task inspired in the Neisser paradigm was administered to 34 Remittent Recurrent MS patients and 35 age and education matched controls. Mean age for patients was 42 (±7.6) years. Median EDSS score was 2.80 (range: 0-6.5) and mean disease duration was 132 (±82.5) months. Subjects had to detect the presence or absence of a "Z" target letter (Stimulus: target vs. no-target) under two flanker letter conditions (Distracter: easy vs. difficult). Differences between conditions were explored using MANOVA. Two ratio scores were also calculated to disentangle the efficiency of IC and VS attentional mechanisms (Dif-Non target/Easy-non target, and Dif-Non target/Dif target, respectively).
Results: The three main effects (Group, Stimulus, Distracter) modulated RTs, being slower responses in MS patients, to non target stimulus, and to difficult distracters. A significant Group × Stimulus interaction revealed that RT differences between 'non target' and 'target' stimulus were larger for patients than for controls. No additional interactions reached significance. The analysis of ratio scores did not reveal differences between groups.
Conclusions: Speed of information processing seems to be the main factor accounting for MS attentional difficulties in the Visual Search Task, being IC and VS relatively spared.

P2334

Olpidem induced arousal by paradoxical GABAnergic stimulation: a case report with F-18 flumazenil & the F-18 FDG PET study

J.S. Yeo
Nuclear Medicine, Dongguk University Ilsan Hospital, Goyang, Republic of Korea

Zolpidem is a non-benzodiazepine drug belonging to the imidazopiridine class. It has selectivity for stimulating the effect of gamma amiobutyric acid (GABA) and is used for therapy of insomnia. We experienced a paradoxical effect of zolpidem in an 48-year-old male who had hypoxic brain damage after cardiac arrest. He was confused and could not communicate with his family. His Glasgow coma scale (GCS) was E2M5V2 and his cognition was grade III by Rancho Los Amigos (RLA). We tried zolpidem for induction of sleep and he became alert (GCS 15, RLA VII) and communicable 30 minutes after administration of zolpidem. This arousal lasted 3 hours and repeated each time of medication. EEG showed the reversal of slow wave into beta range fast activity. F-18 Flumazenil PET showed increased GABAnergic receptor activity in both frontoparietotemporal cortex after zolpidem administration compared to baseline status (zolpidem off). F-18 FDG PET did not show any glucose metabolic difference between baseline and zolpidem trial status. Our hypothesis is that an abnormal GABA receptor after brain ischemia induced the arousal by stimulation of zolpidem.

P2335

Severe traumatic brain injury and facilitated communication

M.-A. Bruno, C. Schnakers, A. Vanhaudenhuyse, S. Laureys
Coma Science Group, Centre de Recherches du Cyclotron, Université de Liège, Liège, Belgium

Facilitated communication (FC) describes the process by which a disabled person is physically assisted by another person ('facilitator') to communicate using a communication board, modified typewriter or computer. The majority of controlled experimental studies have shown its invalidity in children with severe developmental disabilities. Nevertheless, proponents of FC propose the technique in communicatively impaired or non-communicative patients with acquired acute brain injury. We assessed the efficacy of FC in 3 patients with chronic disorders of consciousness following coma. Following auditory or visual presentation of a word or picture to the patient in the absence of the facilitator, the latter re-entered the room and was requested to assist the patient to communicate the presented word or picture. Patients' level of consciousness and motor communication were assessed using the Coma Recovery Scale Revised (CRS-R). Patient 1 was a 47-y-old male who was studied 26 years after an acute traumatic brain injury (TBI) (CRS-R total score of 11). Patient 2 was a 37-y-old male who was studied 25 years after TBI (CRS-R total score of 10). In both patients none of the presented words could be correctly communicated via FC. Patient 3 was a 46-y-old male who was studied 11 years after TBI (CRS-R total score of 20). In this patient all of the presented words could be correctly communicated via FC. In conclusion, despite the demonstrated usefulness of FC in one of the 3 presented cases, the use of FC in TBI patients should be promptly controlled for verification of the facilitator prior to its clinical use.

P2336

Exposure of manganese nanoparticles induce blood-brain barrier disruption, brain pathology and cognitive and motor dysfunctions in rats

H.S. Sharma[1], R. Patnaik[2], A. Sharma[3]
[1]Anesthesiology and Intensive Care Medicine, Uppsala University, Uppsala, Sweden, [2]School of Biomedical Engineering, Banaras Hindu University, Inst Technology, Varanasi, India, [3]Anesthesiology and Intensive Care Medicine, Uppsala University Hospital, Uppsala, Sweden

There are reasons to believe that exposure of manganese (Mn) nanoparticles from various industrial sources could target basal ganglia of humans causing Parkinson's disease. This hypothesis was tested in this investigation using a rat model. Rats were administered Mn nanoparticles (30-40nm size) in a dose of 10 or 20mg/kg, i.p. daily for 7 days. Saline treated rats were used as controls. These animals were tested for behavioural dysfunctions on Rota Rod performance, inclined plane angle and grid-walking tests using standard procedures. In addition, blood-brain barrier (BBB) permeability to Evans blue and radioiodine, brain oedema formation and brain pathology was also examined. Mn nanoparticles treated rats showed profound abnormalities in their cognitive and motor functions in a progressive manner from the 4th day and onwards up to 8th day. The magnitude of the BBB disruption, brain pathology and brain oedema formation correlated well with the intensity of cognitive and motor dysfunction in Mn treated rats. Thus, the sensory-motor cortex, hippocampus, caudate putamen, cerebellum and thalamus showed profound increase in the BBB disruption, brain oedema and brain pathology as compared to other brain areas like hypothalamus, pons, medulla and spinal cord. A close correlation between BBB dysfunction and brain pathology using Nissl staining was also evident in nanoparticle treated animals. These effects of Mn nanoparticles were dose dependent. Taken together, our results are the first to demonstrate that Mn nanoparticles could induce selective brain pathology and alter cognitive and motor dysfunction in rats.

P2337

Improvement in social functioning and decrease in burden of disease in adolescents with ADHD after switching onto OROS MPH, and their care givers

B. Schaeuble[1], A. Alfred[2], A. Lindermueller[2], S. Dichter[3], F. Mattejat[4]
[1]EMEA Medical Affairs, Janssen Cilag GmbH, Neuss, [2]Child and Adolescent Psychiatry, Private Neurological Practice, Munich, [3]Formerly Janssen Cilag GmbH, Neuss, [4]Child and Adolescent Psychiatry, University of Marburg, Marburg, Germany

Objective: To explore functionality, burden of disease and quality of life outcomes in adolescents with ADHD transitioning onto OROS methylphenidate (MPH).
Methods: Pooled analyses of two similar 12-week open-label, flexible dose, non interventional trials exploring outcomes in adolescents with ADHD (ICD-10) transitioning from either IR/ER MPH, or ATX onto OROS MPH. Assessments included Conners' parent rating scale (CPRS), children's global assessment scale (C-GAS), and quality of life (ILC).
Results: 186 adolescents (84.4% boys; median age 14 years) were analyzed. Starting dose of OROS MPH was based on clinical judgment. Median dose of OROS MPH at baseline and endpoint was 36mg/day. Functionality based on C-GAS as well as burden of disease scores measured in parents and adolescents improved at endpoint ($p<0.001$). 80% girls and 67% of boys achieved an at least 30% reduction on CPRS. ILC-LQ0-28 in adolescents and their care givers improved ($p<0.05$). 56 adolescents (30.1%) experienced at least one treatment emergent adverse event (AEs >3% were insomnia (4.8%), headache (3.8%), viral infection (3.8%), involuntary muscle contractions (3.2%) and impaired concentration (3.2%)).
Conclusion: Adolescents with ADHD transitioning onto OROS MPH showed clinically relevant improvement in daily functioning and quality of life aspects. A decrease of burden of disease in patients and their care givers was reported.

P2338

Long-term treatment outcomes in adults with ADHD treated with OROS MPH

B. Schaeuble[1], M. Hofecker[2], J.K. Buitelaar[3], E. Konofal[4], S. Kooij[5], J. Dejonckheere[6], S. Waechter[7]
[1]EMEA Medical Affairs, Janssen Cilag GmbH, Neuss, Germany, [2]Specialist FMH, Private Neurological Practice, Basel, Switzerland, [3]Psychiatry, UMC St. Radbout, Nijmegen, The Netherlands, [4]Psychiatry, Hopital Robert Debré, Paris, France, [5]Psychiatry, 3PsyQ Psycho Medical Centre, Den Haag, The Netherlands, [6]Statistics, SGS Belgium N.V., Mechelen, Belgium, [7]EMEA Medical Affairs, Janssen Cilag EMEA, Baar, Switzerland

Objective: To assess long-term efficacy, safety and tolerability outcomes of flexibly dosed (18-90mg/day) OROS MPH in adults (age 18-65) with ADHD

Methods: Prospective, open-label trial in adults with ADHD who completed a 5-week double blind, 7-week open-label study (42603ATT3002), and continued treatment with OROS MPH until inclusion into the current trial. Subjects were followed up at least 52 weeks. Measures included Conner's adults ADHD rating scales (CAARS), and safety parameters.

Results: 155 subjects (54.2% male, mean (SD) age 35.0 (10.6)) were treated on average for 437.1 (206.8) days. 56 subjects discontinued prematurely. The mean (SD) daily OROS MPH dose was 52.8 (21.0) mg. At endpoint, mean total CAARS, and self-reported total CAARS-S:S scale score improved ($p<0.001$ for all). Mean (SD) change from baseline of this study to endpoint in systolic BP were 0.9 (14.92), 0.8 (9.98) mmHg in diastolic BP, and +1.3 (15.54) in pulse rate. Hypertension was the only CV AE reported in ≥5% of the subjects (5.8%). 7.7% experienced at least one, though unrelated, serious AE. AEs reported in >6% were headache (21.3%), nasopharyngitis (20.0%), restlessness (7.7%), back pain (7.4%), insomnia (7.4%) and influenza (6.5%).

Conclusions: OROS MPH was effective and well tolerated during this long-term study. The AE and CV profile observed was similar to other trials in adult ADHD patients. Mean changes in BP and pulse rate were generally small and unlikely to be clinically relevant. Results suggest no further increment in BP and pulse rate during prolonged exposure.

P2339

PrePulse inhibition of the acoustic startle response is associated with visual processing and executive function in patients with idiopathic RBD and Parkinson's disease

M.E.A. Zoetmulder[1,2], H.B. Biernat[1], M. Nikolic[2], L. Korbo[1], P.J. Jennum[2]
[1]Bispebjerg Hospital, Copenhagen, [2]Glostrup Hospital, Glostrup, Denmark

Background: PrePulse Inhibition (PPI) of the startle reflex is a measure of sensorimotor gating. PPI reflects the ability to filter out irrelevant information in the early stages of information processing so attention can be directed to more salient features in the environment. The aim of this study was to investigate possible correlations between PPI and cognitive function in Parkinson's disease (PD) and patients with idiopathic REM sleep behaviour disorder (idiopathic RBD), a possible preclinical stage of parkinsonism.

Methods: 12 idiopathic RBD and 16 PD patients underwent neuropsychological assessment, PPI, neurological examination (e.g. UPDRS-III, Hoehn & Yahr), polysomnography, screening questionnaires and audiological screening. The following tests from the Cambridge Neuropsychological Test Automated Battery (CANTAB) were applied: Intra/Extra dimensional set shift (IED) Reaction Time (RTI) and Rapid visual processing (RVP). Other tests used were the Serial digit monitoring test (SDMT) and the Rey Auditory Verbal learning test (RAVLT).

Results: Both idiopathic RBD as well as PD patients showed significant correlations between PPI (latency 30msec/75dB), SDMT ($p\leq0.05$ and $p\leq0.01$ resp.) and IED (both $p\leq0.05$). Furthermore a significant correlation was found between PPI (latency-pulse alone) and RVP ($p\leq0.05$ and $p\leq0.01$ resp). PD patients also showed a significant correlation between PPI (latency 30msec/75dB), RTI and RAVLT (both $p\leq0.05$). There were no significant differences on PPI trials between both groups.

Conclusion: Our findings suggest that PPI is associated with visual processing and mental set shifting in idiopathic RBD and PD.

P2340

Role of memory impairment in smell identification failure in patients with Alzheimer's disease and mild cognitive impairment

H. Magerova, M. Vyhnalek, A. Varjassyova, Z. Nedelska, J. Laczo, M. Bojar, J. Hort
Neurology, Charles University, 2nd Medical School and Motol Hospital, Prague, Czech Republic

Objective: Patients with Alzheimer's disease (AD) and its prodromal stages represented by amnestic Mild Cognitive Impairment (aMCI) have an impairment of smell identification which correlates with disease progression. This impairment is caused by degeneration of olfactory pathways; however we hypothesize that cognitive decline may also contribute.
Methods: 24 AD patients, 57 aMCI multi-domain (aMCIm) and 19 aMCI single-domain (aMCIs) patients and the control group (n=19) underwent extended neuropsychological assessment and smell identification assessment using a validated test developed at our memory clinic – the Motol Hospital Smell Test (MHST). Results in MHST were correlated with mini-mental state examination (MMSE), Auditory Verbal Learning Test (AVLT) and Free and Cued Recall Test (FCRT).
Results: Smell identification was significantly impaired in AD ($p<0.001$), aMCIm ($p<0.01$) as well as aMCIs ($p<0.05$) compared to the control group. Correlation between MHST and neuropsychological tests was not significant for MMSE and FCRT ($p>0.05$); there was weak correlation between MHST and AVLT ($r=0.184$, $p<0.05$). As formerly approved, MHST results correlate with the University of Pennsylvania Smell Identification Test (UPSIT) results ($r=0.68$, $p<0.0005$).
Conclusions: Our results confirm findings that smell identification impairment starts in early or even prodromal stages of AD and further deteriorates with the disease progression. However, even if there is a parallel between smell identification and disease severity, the results show that smell identification deficit in AD is not caused and explicable by the memory impairment.

P2341

Emotional deficit as an early marker of Alzheimer's disease

A. Varjassyova[1], D. Horinek[2], H. Magerova[1], M. Vyhnalek[1], J. Laczo[1], J. Hort[1]
[1]Motol Hospital and Charles University, [2]Charles University, Prague, Czech Republic

Background: Amnestic mild cognitive impairment (aMCI) patients (especially those with multiple domain deficit) form a heterogeneous population that is at higher risk for dementia development. Amygdala plays an important role in facial expression processing as well as emotional recognition of visual stimuli and number of neuroimaging and neuropathological studies in aMCI subjects have demonstrated atrophy and pathological changes of this structure. We tested the hypothesis that facial emotion recognition is affected early in AD and in patients with aMCI.
Methods: The study included 23 AD and 31 aMCI patients and 19 controls. The aMCI patients were further classified to aMCI single (aMCIsd, n=13) and multiple (aMCImd, n=18) domain groups based on Petersen's criteria. All patients were tested by Facial Emotion Recognition Test examining emotional agnosia and Familiar Faces Identification Test examining the ability to recognize familiar faces. The subjects further underwent routine neuropsychological tests (focused on memory, attention and processing speed, executive, visuospatial and language functions)
Results: The AD ($p<0.01$) and aMCImd groups ($p<0.05$) performed worse in recognition of facial emotions than controls, but there were no differences in identification of familiar faces between these groups ($p>0.05$). The aMCIsd was not impaired in both tests compared to controls ($p>0.05$).
Conclusions: Our results support the hypothesis that facial emotion recognition is impaired early in AD and in pre-dementia stages. Decreased capacity to recognize emotions in patients with AD may contribute to patients' distress and caregiver's burden. Medical staff should be aware of this disability and treat the patients accordingly.

P2342

Genotype-phenotype correlations of the cognitive disorders in Bulgarian patients with Duchenne muscular dystrophy

T.K. Chamova[1], V. Guerguelcheva[1], M. Raycheva[1], Z. Mihaylova[2], I. Tournev[1]
[1]Clinic of Neurology, University Hospital "Alexandrovska", [2]Clinic of Child Psychiatry "Sveti Nikola" University Hospital, "Alexandrovska", Medical Faculty, Medical University, Sofia, Bulgaria

Objective: To characterize the genotype-phenotype correlations of the cognitive disorders in Bulgarian patients with Duchenne muscular dystrophy (DMD).
Clinical contingent and methods: 18 boys with DMD aged 6 to 16, genetically confirmed either by MLPA or Multiplex PCR DMD were examined neurologically by using North star ambulatory assessment scale and received general intelligence assessment by Wechsler Intelligence Scales (Bulgarian standardisation) measuring full, verbal, and performance IQ.
Results: The mean IQ of the tested 18 DMD patients is 88.2 varying between 53 and 124. From the 15 patients with mutations in the second part of the gene, 3 had an IQ under 70; 1 with IQ 70-79; 6 with IQ 80-89; 2 with IQ 90-109 and 3 with IQ over 109. From the 3 patients with mutations in the proximal part of the gene, 2 are with IQ 80-89 and 1 with IQ and one with IQ 90.
Conclusions: 83% of the presented cases are with mutations in the second part of the dystrophin gene, mainly around exons 44-52 gene, typical for the Bulgarian population. Boys with DMD have cognitive impairment with mean Full Scale IQ approximately 1 standard deviation below the mean which does not correlate with their motor abilities. Distal deletions in the dystrophin gene are more frequently associated with intellectual impairment.

P2343

Reduplicative paramnesia secondary to T-cell brain lymphoma

S. García Ptacek, O. Rodriguez Perez, C. Valencia Sanchez, V. Isernia, L. Gomez Vicente, A. Marcos Dolado, J. Porta-Etessam
Neurology, Hospital Clinico San Carlos, Madrid, Spain

Reduplicative paramnesia is a misidentification syndrome characterized by the delusional belief that an unfamiliar place is duplicated in another, more familiar, location. It has been described in patients with focal right hemispheric lesions, usually accompanied by diffuse brain damage. Dementia, psychiatric disorders, stroke and head trauma seem to be the most common causes. We describe the case of a 29-year-old male who developed reduplicative paramnesia secondary to T-cell brain lymphoma. He claimed that he was in a duplicate of the Hospital Clinico de Madrid which had been built in his flat and held this belief despite contrary evidence. He also claimed that he had two children, while he only had one. He could name the false child and give an approximate age, but remained vague about other details. The MRI showed multifocal lesions in frontal white matter, basal ganglia, and cerebellar hemispheres complicated by multiple small infarcts and intracranial hypertension. Diagnosis of T-cell brain lymphoma was made through brain biopsy. As far as we can ascertain, this is the first published case of reduplicative paramnesia secondary to T-cell lymphoma. The diffuse damage, coupled with frontal and temporal lesions, help to explain the patient's symptoms.

P2344

Do task complexity and sensory modality modulate speed of cognitive processing in multiple sclerosis?

G. Lubrini[1], C. Oreja-Guevara[1], J.A. Periañez Morales[2,3], M. Ríos Lago[2,4], R. Viejo Sobera[3], J. Álvarez-Linera[5], E. Diez-Tejedor[1]
[1]Neurology, University Hospital La Paz, [2]Neuroimaging, Research Unit Proyecto Alzheimer Fundación Reina Sofia, [3]Basic Psychology, UCM, [4]Basic Psychology, UNED, [5]Neuroradiology, International Ruber Hospital, Madrid, Spain

Introduction: Convergent neuropsychological evidences suggest that slowness of information processing represent a primary deficit in Multiple sclerosis (MS). However, studies that have used laboratory based reaction time (RT) paradigms have yielded inconsistent findings. Moreover, only a few studies have attempted to disentangle the influence of task complexity and sensory modality in patients' performance.
Objectives: To clarify
(1) the sensibility of RT tasks to MS deficit
(2) the relationship between task complexity and RT enhancement, and
(3) whether distinct sensory modalities (visual vs. auditory) are differentially impaired.
Method: Six RT tasks were administered to 34 relapsing remitting MS patients and to 35 matched controls: Simple and choice RT tasks (visual and auditory), the Sustained Attention to Response Test (SART), and a visual search task. Mean age for patients was 42 (±7.6) years. Median EDSS score was 2.80 (range: 0-6.5), and mean disease duration was 132 (±82.5) months.
Results: Patients performed slower in all visual tasks except for the simple RT task. Moreover, as tasks demands increased, differences between groups progressively increased. RT differences, remained after controlling for perceptual-motor speed (using simple RT as covariate). Lastly, no differences were found between groups regarding sensory modalities in the simple and choice RT tasks.
Conclusion: Results suggest that RT tasks are sensitive to slowness of information processing in MS patients. Findings are interpreted within the relative consequence model stating that a primary difficulty for patients with MS is reduced information processing speed.

P2345

Evaluating the effect of carotid endarterectomy on the cognitive functions of patients having a carotid stenosis more severe than 70%

A. Frendl[1], A.B. Burai[1], L. Kardos[1], K.R. Kovacs[1], S. Olvaszto[2], K. Litauszky[2], F. Bodnar[2], L. Csiba[1]
[1]Neurology, [2]Vascular Surgery, University of Debrecen, Medical and Health Science Centre, Debrecen, Hungary

Objectives: The cognitive functions of patients undergoing carotid endarterectomy have been reported to improve after the operation. Our study aimed to make these changes objective.
Methods: 25 patients (16 men, 9 women, age: 64.61±7.98 years) with a carotid stenosis more severe than 70% were tested. 17 of them had an asymptomatic while 8 of them had symptomatic stenosis related to TIA/minor stroke. Patients had to score at least 24 on the MMSE to be selected. They were examined before and 6-10 weeks after the carotid endarterectomy. Breath holding index was calculated to determine their cerebrovascular reserve. The degree of the stenosis was measured both by carotid Doppler and CTA. Control CT was performed to rule out new vascular lesions. 8 types of tests were completed examining the main cognitive abilities.
Results: Significant improvement was detected in the reaction time (Choice Reaction Time; p=0.0083), short term verbal memory and verbal learning ability (Rey AVLTN; p=0.0046), in attention (Pieron Test; p=0.012) and in short (p=0.0244) and long (p= 0.004) term visual memory (Ray-Osterreith Complex Figure Test). A tendency of improvment was found in visually derived motor functions (Trail Making, WAIS Digit Symbol Test), in short term memory for numbers (WAIST Digit Span) and in analyzing and synthesizing abilities (WAIST Block Design Test). There was no cognitive decline detected.
Conclusion: Based on our findings we suggest that patients having a hemodynamically significant carotid stenosis can benefit from the endarterectomy not just by preventing an upcoming stroke but by achieving cognitive improvement.

P2346

Alterations induced by early stage hypertension are reversible

K.R. Kovács[1], C.C. Szekeres[2], Z. Bajkó[2], K. Csapó[1], S. Molnár[1], L. Oláh[1], M.T. Magyar[1], D. Bereczki[3], L. Kardos[4], P. Soltész[5], L. Csiba[1]
[1]Department of Neurology, University of Debrecen, Medical and Health Science Centre, Debrecen, Hungary, [2]Department of Neurology, Mures County Clinical Emergency Hospital, Târgu-Mures, Romania, [3]Department of Neurology, Semmelweis University, Budapest, [4]Contract Statistician, Kenézy Gyula Hospital, [5]3rd Department of Internal Medicine, University of Debrecen, Medical and Health Science Centre, Debrecen, Hungary

Introduction: Hypertension is the most prevalent of the modifiable risk factors for stroke and it is also associated with an increased risk of cognitive decline. Previously we have found significant differences between newly diagnosed hypertensive patients and healthy controls after examining the early changes of the morphological and functional characteristics of the arterial wall and neuropsychological performance. In the present study we investigated whether these changes induced by early stage hypertension are reversible.

Methods: 51 newly diagnosed hypertensive patients (44.9±10.6 years, male/female: 1.2) were recruited in the study. We performed the following examinations: laboratory tests, ambulatory blood pressure monitoring (ABPM), intima-media thickness (IMT) measurement, head-up tilt table testing (HUTT) and neuropsychological tests. The examinations mentioned above were also performed after 1 year of antihypertensive therapy.

Results: During ABPM both systolic and diastolic blood pressure values showed significant reduction. IMT values decreased after 1 year therapy (0.61±0.11 vs. baseline 0.64±0.11mm, p=0.0516). Improvement was observed also in memory (Digit Span Test: forward recall p=0.0408, backward recall: p=0.0247), attention (Pieron Test: p=0.0291) and general processing speed (Digit Symbol Test: p<0.0001). Score of trait and state anxiety showed significant reduction (p=0.0012, p=0.0004). Results of HUTT are under evaluation.

Conclusion: Changes of neuropsychological parameters and the morphological and functional characteristics of the arterial wall induced by early stage hypertension proved to be reversible, therefore appropriate treatment started in time might prevent not only the further complications, but also the neuropsychological alterations.

P2347

Evaluation of obsessive compulsive symptoms in patients with focal dystonia, hemifacial spasm and in healthy subjects

G. Strigaro[1], M. Mula[1], A. Tribolo[2], S. Ruggerone[1], G. Burgio[1], R. Cantello[1], F. Monaco[1]
[1]Department of Neurology, Amedeo Avogadro University, Novara, [2]Department of Neurology, University of Turin, Turin, Italy

Introduction: Although pathophysiology of focal dystonia (FD) is anatomically related to the basal ganglia and the thalamus-cortical networks, many patients have concomitant psychopathology, suggesting a psychiatric component to the disease phenomenologically similar to obsessive compulsive disorder (OCD) in terms of repetitive, perseverative and persistent nature of symptoms. Hemifacial spasm (HFS) results from peripheral facial nerve irritation. In this study we investigate OCD spectrum symptoms in patients with FD, HFS and healthy controls (HC) matched for age and gender.

Methods: All subjects have been investigated using the Hospital Anxiety-Depression Scale (HADS), the Symptom Checklist-90-Revised (SCL-90), the Structured Clinical Interview for Obsessive Compulsive Spectrum (SCI-OBS) lifetime self-report version.

Results: We evaluated 60 subjects (FD=19; HFS=18; HC=23), mean age 60 years, 54 females. At the SCL-90, FD and HFS patients showed higher scores than HC for Somatization (FD=13.7±7.8; HFS=13.0±8.9; HC=7.0±5.7; p=0.009) and the Positive Symptom Distress Index (FD=1.8±0.5; HFS=1.5±0.5; HC=1.1±1.2; p<0.001). At the SCI-OBS, HFS patients showed higher score than FD and HC for Contamination Symptoms (HFS=2.6±1.7; FD=1.2±1.3; HC=0.9±1.2; p=0.005) and aggressiveness (HFS=1.7±2.0; FD=0.4±0.7; HC=0.4±0.7; p=0.024).

Conclusions: Despite the different pathophysiology, FD and HFS showed a similar spectrum of comorbid psychopathology especially concerning mood, anxiety and obsessive compulsive spectrum symptoms.

P2348

Acquired surface dyslexia and dysgraphia: a study on Italian aphasic patients

C.V. Marinelli[1,2], A. Craca[3], M. Lo Muzio[4], C. Lograno[4], P. Angelelli[4]

[1]Department of Psychology, University of Rome La Sapienza, Rome, [2]Neuropsychological Research Centre, IRCCS Foundation Hospital Santa Lucia, Roma, [3]Neuropsychological Research Centre, IRCCS Foundation Hospital S. Maugeri, Cassano Murge, [4]Department of Psychology, University of Bari, Bari, Italy

A deficit in lexical processing may be due to an impairment at different loci (for developmental dyslexia see Friedmann et al., 2008). This study will analyze the locus of lexical reading and spelling deficit among Italian aphasic patients. Participants were 34 aphasic patients, examined for language (AAT; Luzzatti et al.,1996), spelling (Luzzatti et al. 1994) and reading (Sartori, 1984) skills. In order to investigate the locus of the lexical deficit a battery of tests – including lexical decision (visual and acoustic), comprehension (visual and acoustic) and denomination (oral and write) tasks – have been used. Regression analysis shows that the accuracy in reading irregular words was influenced only by the input orthographic lexicon ($p<0.05$). The ANOVA highlight that visual lexical decision was more impaired than denomination and comprehension (at least $p<0.001$). The access to the semantic system is easier in written comprehension than in oral denomination ($p<0.01$). As regards spelling, regression analysis shows that spelling of irregular words was influenced by written denomination ($p<0.05$) and acoustic lexical decision ($p<0.05$). Written denomination was more impaired than acoustic lexical decision and comprehension (at least $p<0.001$). Patients have a similar performance in acoustic lexical decision and acoustic comprehension. The locus of impairment in lexical reading seems due to a deficit in the input orthographic lexicon; while in lexical spelling in both the input phonological lexicon and the passage from the semantic system to the output orthographic lexicon. In both modalities, denomination was more difficult than comprehension.

P2349

Cognitive impairment in patients with mid- to late-stage Parkinson's disease (PD)

S. De Santi[1,2], R. Anand[3], V. Lucini[4], P. Rice[4], for the Study 016 Investigators

[1]MedAvante Inc, Hamilton, [2]Dept of Psychiatry, NYU School of Medicine, New York, NJ, USA, [3]APC AG, St Moritz, Switzerland, [4]Newron Pharmaceutical SpA, Bresso, Italy

Introduction: Many patients with PD experience cognitive dysfunction.
Objective: To assess cognitive function in patients with mid- to late-stage PD (>3 years' duration).
Methods: A customised, computerised cognitive testing system (Cogtest®) was used to test cognitive function in 656 patients with PD (mean age: 60±9 years) receiving L-dopa and other PD medications and experiencing motor fluctuations. Eight cognitive variables were assessed at screening. Data were converted to z-scores based on healthy control data from the Cogtest database (n=240; mean age: 50±17 years). Z-scores of 0 and -1 represent average performance and performance that is one standard deviation (SD) below the normative group mean, respectively. Impairment within a test was defined as a performance >1.5 SD below the normal mean (i.e., z-score <-1.5).
Results: At screening visit, impairment in ≥1 cognitive variable was demonstrated in 96% of patients when compared with the normative group. The percentages of patients showing impairment in the individual cognitive variables compared with age-matched healthy volunteers were: Auditory Number Sequencing (ANS), 84%; Word List Memory, with and without delayed recall and recognition, both 39%; Symbol Digit Substitution, 36%; Tower Of London, 48%; Strategic Target Detection, 46%; Spatial Working Memory (SWM)-short, 48%; SWM-long, 64%. In contrast, in a non-PD population, only 7% of people would be expected to show cognitive impairment in any individual test.
Conclusions: These data imply that cognitive deficits are widespread in patients with mid- to late-stage PD. The most common impairment was in verbal working memory (84%, assessed by ANS).

P2350

Neurophysiological, neuropsychological and psycho-physiological methods in studying brain function in cardiothoracic surgery patients

A. Vasyatkina[1], V. Postnov[1], E. Levin[1], V.V. Lomivorotov[2], T. Tretyakova[1]
[1]Neuroreanimatology Group, [2]Department of Anaesthesiology and Reanimatology, Research Institute of Circulation Pathology, Novosibirsk, Russia

Objective: Neurocognitive dysfunction is an important complication after cardiopulmonary bypass surgery. The main goal of our study was to assess neurocognitive functions after cardiothoracic surgery using cardiopulmonary bypass in patients with acquired heart diseases.
Methods: 30 patients were examined before and 10-14 days after cardiothoracic surgery. Neurophysiological assessment included EEG and cognitive evoked potentials(P300). Neuropsychological tests were taken from classic Luria battery and included tests for speech productivity, visual-constructive activity etc. Psycho-physiological assessment included reaction time tests with various cognitive loads and face emotionality recognition task. Standard neurological examination was also performed. Comparisons were made for pre- and post-surgery results and between patients, undergoing surgery for the first and second time. Non-parametric Kruskall-Wallis ANOVA and Spearman's rank correlation were used for statistical analysis.
Results: Differences between pre- and postsurgical results were moderate. It could be associated with improvement of haemodynamics after surgery, and/or with reduction of emotional stress. Patients undergoing primary and repeated surgery also differed in several tests, particularly those assessing neurodynamical components. Importantly, results of corresponding psycho-physiological, neuropsychological and neurological examinations were highly correlated with each other.
Conclusions: Neurophysiological, neuropsychological and psycho-physiological methods are useful tools to assess the functional state of the central nervous system and neurocognitive functions in cardiothoracic surgery. Also, due to high sensitivity of psycho-physiological tests and cognitive EP and lack of effect of learning, they could be used for repeated examinations for control of neurorehabilitation process. Cognitive EP is an objective method to diagnose subclinical impairment of cognitive brain functions.

P2351

Elevated plasma copper/zinc ratios in patients with schizophrenia

N. Mansouri, D. Farzin
Dept. of Pharmacology, Mazandaran University of Medical Sciences, Sari, Iran

Introduction: Copper and zinc are neuroactive substances that can be synaptically released during neuronal activity. These metals have been implicated in diseases with neuro-psycho-pathological components, including Alzheimer's disease, Menkes disease, Wilson's disease, Pick's disease, stroke, seizures and schizophrenia. The purpose of the present study was to examine the plasma levels of copper (Cu) and zinc (Zn) in schizophrenic patients and to compare the Cu/Zn ratios with that of matched healthy subjects.
Materials and methods: 40 patients with schizophrenia were sampled (35 males and 5 females; mean age 32.77 years) along with 50 (41 males and 9 females; mean age 31.44 years) healthy controls. Exclusion criteria included another concurrent psychiatric disorder, pregnancy, and medical disorders or drugs known to affect trace element metabolism. Fasting blood samples were withdrawn from an antecubital vein between 07.00 and 09.00 h. Plasma copper and zinc levels were measured using an atomic absorption spectrophotometer. Two-tailed t-test was used to determine statistical differences. Differences were considered significant at the level of $p<0.05$.
Results: Mean Cu or Zn levels and Cu/Zn ratios for each of the two groups are shown below: Cu (μg/dl) =65±3 or 145±28, control or patients, respectively, $p<0.005$. Zn (μg/dl)=81±4 or 67±2, control or patients, respectively, $p<0.05$. Cu/Zn ratio=0.87±0.04 or 2.07±0.38, control or patients, respectively, $p<0.05$.
Conclusion: There was a significant higher Cu/Zn ratio in schizophrenic patients compared to healthy subjects. These results suggest that Cu and Zn may be involved in the pathophysiology of schizophrenia.

P2352

Involvement of cerebellum in triggering and regulation of aggressive behaviour

M. Tchaia
Center of Acupuncture Reflexotherapy and Chinese Medicine, Tbilisi, Georgia

In the cerebellum sites have been found (nodulus vermis, n.fastigii), whose electrical stimulation induced emotional aggressive responses. Weak stimulation of either VN or aggression-inducing regions of cerebellum, separately, did not change animals' behaviour, while joint stimulation of the same regions induced typical aggressive response. Aggression induced by cerebellar stimulation is realized through CGM – following electrolytic ablation of CGM, aggressive behaviour in response to the stimulation of abovementioned cerebellar sites (as well as hypothalamus) was not observed. Along with aggression-inducing sites there were found regions in cerebellum (pyramis, paramedian lobule), whose stimulation suppressed aggressive behaviour induced by cerebellum and other brain sites. Therefore, cerebellum, jointly with other brain structures, participates in triggering and regulation of aggressive behaviour.

P2353

The study of mental profile MMPI in Iranian epileptic patients and comparison with a control group

M.R. Najafi[1], F. Rezaei[1,2], N. Vakili[2], F. Najafi[2]
[1]*Isfahan University of Medical Sciences,* [2]*Isfahan Neurosciences Research Center, Isfahan, Iran*

Objective: Patients with epilepsy have special mental profiles and experience particular psychological and exciting tissue. Some studies reported happening of disorder epilepsy and psychopathology. The aim of this study is research and comparison of mental profile MMPI epilepsy patients with idiopathic grand male (GMS) and complex partial (CPS) and compare it with control groups.
Method: Present research was a analyzing and comparing type; carried out in 1,387 patients at neurology clinics in Isfahan; selected 40 patients with epilepsy GMS and CPS. Questionnaire MMPI with seventy first question form was used for studying mental profile of these people. Data were analyzed by SPSS soft ware and ANOVA and $\chi 2$ statistical tests.
Results: This research showed that though marks patient has more increase in clinical scales MMPI compared to control group. Epilepsy patients had more increase mark in scales Hypochondrias (Hs), Depression (D) and Hysteric (Hs) compared with control group only in CPS epilepsy group the difference was significant.
Conclusion: With attention, the findings of this research epilepsies patient are more likely to be in psychological disorder compared with public population. This conclusion emphasizes to consider the necessity of psychological treatment along side of drug therapies.

P2354

The Western Aphasia Battery – Revised (W.A.B. – R): a pilot study and validation in normal Greek population

D. Tafiadis, E. Gavriilidou, K. Kantarakia, V. Mitsiou, G. Nasios
Speech and Language Therapy, TEI of Epirus, Ioánnina, Greece

Introduction: Purpose of the present pilot study was the validation and evaluation of Western Aphasia Battery – Revised for Greek population. W.A.B. – R was originally created by Kertesz (1982), and revised in 2006, and is divided into 3 forms, main form (1), supplementary form (2) and bedside form (3).
Material and methods: The commercial version of the test was adapted in Greek language by a linguist, three speech language therapists and 2 native speakers of Greek language, having proficiency in English, and two native speakers of English having proficiency in Greek, and changes were contacted, for the best representation of the Greek version. In this research 300 participants were evaluated (m/f: 1:1), 100 for each form separately, recruited from Greek settings. The participants had no medical history of CNS diseases that could probably influence their performance.
Results: Statistical analysis of the data revealed that the results obtained were generally consistent. We also saw that the particular scale was not influenced by various parameters such as sex and educational level. Also reliability and validity test were contacted and showed high criterion (a – Cronbach =0.950 for form 1, 0.965 for form 2, 0.916 for form 3, and a – Cronbach in total =0.964).
Conclusions: The battery appears to be sensitive to Greek reality and presents satisfactory criterion, internal consistency, temporal stability, inter-rater reliability, and high content validity. The participants demonstrated clear patterns of responses. Further research must be done, to exclude or include any new adaptation.

P2355

The effect of donepezil versus other drug therapy on stress and objective burden in caregivers of de-novo patients with Alzheimer's disease

J.L. González[1], V. Peset[2], I. Casado Naranjo[3], M. González-Adalid[4], J. Rejas[4]
[1]Servicio de Neurología, Hospital Cínico San Carlos de Madrid, Madrid, [2]Servicio de Neurología, Hospital General Universitario de Valencia, Valencia, [3]Jefe de Sección de Neurología, Complejo Hospitalario de Cáceres, Cáceres, [4]Medical Unit, Pfizer España, Alcobendas (Madrid), Spain

Objective: To compare the effect of donepezil with other drug therapy (ODT) on stress and objective burden in caregivers of de novo patients with dementia of Alzheimer's Disease type (AD).
Methods: A 6-month, prospective, observational study enrolled naïve patients with possible/probable AD according to DSM-IV/NINCDS-ADRDA criteria. Comparison on caregiver's stress and objective burden was carried-out between donepezil and matched controls treated with ODT (rivastigmine, galantamine or memantine) given at standard doses in monotherapy for 6 months. Caregiver's stress and objective burden were assessed with the ZARIT scale and by computing daily hours devoted to the care of patients on basic and instrumental activities of daily-living (BADL, IADL), behaviour supervision and nursing home institutionalization.
Results: 92 naïve age-sex-MMSE matched pairs were formed; 70.3% women, 79.0 (5.8) years. ODT was 45% on rivastigmine, 29% on galantamine, and 25% on memantine. Compliance (Morisky-Green questionnaire) was higher in the donepezil group; 90% vs. 67%, p<0.01. Stress level and change was similar regardless of treatment. However, caregivers of patients treated with donepezil showed a significant reduction of daily hours devoted to BADL [-0.4 (2.6); p=0.047] and IADL [-0.7 (2.7); p=0.001], and weekly hours of informal care [-9.5 (33.9); p=0.003]; that was not observed in subjects treated with other drugs. The percentage of caregivers abandoning their job as a consequence of patient care was not different between groups; 11% and 9%, respectively (p=0.655).
Conclusion: Caregivers of patients with AD treated on monotherapy with donepezil seem to be less burdened than those treated with usual care.

P2356

A 4-year follow-up study on cognitive performances in patients with metabolic syndrome

V. Tudorica, C. Zaharia, D.F. Pirscoveanu, D. Stanca
University of Medicine and Pharmacy Craiova, Craiova, Romania

Objective: The aim of the study was to evaluate the cognitive performances in patients with metabolic syndrome.
Patients and method: We enrolled in the study 50 patients (24 men and 26 women) who fulfilled the inclusion criteria: diagnosis of metabolic syndrome as defined by IDF, age between 55 and 70 years, at least 8 years of education and no psychiatric illness prior to the study. The study-group was compared with a control-group composed of 50 hypertensive subjects with high similarity to the study-group regarding age, gender, and education. The patients in both groups were evaluated by Mini Mental State Examination (MMSE) and Montreal Cognitive Assessment (MoCa). The evaluation was performed at baseline, 2 years after and at the end of the study. The results were statistically analyzed by Student's test.
Results: At baseline there were no statistically significant differences between the scores obtained on MMSE (28.6±1.6 in study-group versus 29±1.2 in control-group) (p=0.1). The evaluation on MoCa revealed statistically significant differences between scores since baseline (27.9±1.5 in study-group versus 28.5±1.2 in control-group) (p=0.02). At the end of the study the differences were statistically significant on both scales (27±2.4 in study-group versus 28.5±1.6 in control-group on MMSE and 25.6±2.2 in study-group versus 27±1.7 in control-group on MoCa) (p<0.001). In the control-group the scores remained between normal ranges at the end of the study on both scales; in the study-group the score was below normal range on MoCa.
Conclusion: Metabolic syndrome seems to be a risk factor for cognitive decline.

P2357

Transient global amnesia: a retrospective study of 18 patients

A. Ghiţoiu[1], E.C. Rusu[1], C. Pop[1], A. Nichita[1], B.O. Popescu[1,2,3]
[1]*Department of Neurology, University Hospital Bucharest,* [2]*Carol Davila University of Medicine and Pharmacy,* [3]*Laboratory of Molecular Medicine, 'Victor Babeş' National Institute of Pathology, Bucharest, Romania*

Objectives and methods: To evaluate the risk factors and comorbidities in transient global amnesia (TGA). We retrospectively studied all patients admitted to the University Hospital Bucharest between 2007 and 2009 diagnosed with transient global amnesia. We analyzed these patients in respect to age, gender, risk factors, comorbidities, EEG, duplex ultrasonography and brain CT scans.
Results: 18 patients, 14 women and 4 men met the diagnostic criteria for TGA. Their ages ranged from 45 to 74 years. The duration of the attacks lengthened between 1 and 20 hours, two of them having recurrent attacks. 4 of them had precipitating factors: physical activities, contact with cold water or emotional stress. Among the comorbidities, arterial hypertension had the highest frequency (44%) followed by dyslipidemia (33%), and migraine (17%). Interestingly, 4 patients (all women) had thyroid disorders. On brain CT scans, 2 of the patients had bilateral frontal atrophy and 1 had an old ischemic left frontal lesion. EEG was abnormal in 5 patients, showing predominantly frontal lobe abnormalities.
Conclusions: The results of this study are consistent with those from literature regarding age, gender, duration of the attacks, precipitating and risk factors. Our patients had a higher occurrence of thyroid disorders. In some instances, TGA was associated to frontal lobe lesions, which could represent a risk factor for acquisition of new memories due to interruption of pathways connecting the hippocampus with specific cortical areas.

P2358

Neuropsychiatric symptoms as presentation of demyelinating disorders

M.M. Brenha[1], A.G. Velon[2], P. Teixeira[3]
[1]*Hospital de Magalhães Lemos, Porto,* [2]*Centro Hospitalar de Trás-os-Montes e Alto Douro, Vila Real,* [3]*Centro Hospitalar do Médio Ave – Famalicão, Famalicão, Portugal*

Introduction: Inflammatory demyelinating disorders can affect any aspect of the CNS. Although neuropsychiatric or cognitive complications are well-recognized phenomena, their presentations have generally been considered as rare occurrences. Mood changes are the most frequent, but personality changes, anxiety, and, rarely, psychosis also occur.
Case report: A 31-year-old man was admitted in a psychiatry unit on February 2010, because of his aggressiveness and social deviant behaviour. He admitted cannabis intake since his 20s and recent cocaine use. The symptoms started at 25yo with personality changes, such as aggressiveness, impulsiveness and engaging in dissocial acts. He neglected his child after divorce. There was no history of medical or psychiatric illness. At presentation he had poor eye contact, tangential speech, and talked about his business and stealing acts in a superficial way. On neurological examination he had an ataxic gait and right dysmetria. Extensive investigation, including free T3, T4 and TSH, rapid plasm reagin, hepatitis B and C, HIV, immunology tests, ceruloplasm and copper were normal. A computed tomography imaging revealed unspecific periventricular lesions. Subsequent magnetic resonance imaging showed T2-weighted multiple lesions involving the periventricular region, subcortical areas, cerebellar hemispheres and brainstem. None was enhanced with gadolinium contrast. Promp lumbar puncture confirmed the demyelinating nature.
Conclusion: Neuropsychiatric presentation of demyelinating disorders have already been reported. Over the years, the high preponderance of psychiatric symptoms in patients with multiple sclerosis has led to the suggestion that this disease should be routinely included in the differential diagnosis of patients being seen for psychiatric complaints.

P2359

Comparison of a self rating scale to a clinical scale for depression in brain and spinal injury patients in Karachi

M.M. Zubair[1], S. Bashir[1], J. Ashraf[2]
[1]Dow University of Health Sciences, [2]Neurosurgery, Dow University of Health Sciences, Karachi, Pakistan

Objective: To access utility of a self rating depression scale, by comparing it with physician assessed depression scores of patients who are prone to develop symptoms following traumatic brain or spinal cord injury.
Subjects and methods: This case-control study was conducted in a public sector hospital in Karachi, Pakistan with a sample of 295 and a case control ratio of 1:2. Patients of brain and spinal injury were enrolled from the Neurosurgery Out-patient Department as cases. Their relatives were taken as controls and matched for gender. Questionnaire based interviews were conducted. Depression scores were calculated using a WHO verified, Zung Self-rating Depression Scale and a locally designed and verified, physician assessed Aga Khan University Anxiety and Depression Scale. SPSS 16 was used for entry and analysis.
Results: We interviewed 69 male cases and 126 controls and 32 female cases and 68 controls. 40% of the cases suffered only from head trauma and 53.5% suffered from spinal trauma. Through the self rating scale 27.7% cases showed depressives symptoms in comparison to 17.5% controls. While in the physician-assessed scoring 48.5% cases had depression with 34% controls having the same problems. Both scales showed that the odds of having depression in a brain and spinal trauma patient are twice compared to their family members.
Conclusion: The self-rating scale is likely to underestimate the incidence of depression however, more in-depth studies are required to articulate that we can successfully ask the brain and spinal trauma patients checking their depression with only a self rating scale.

P2360

Development of a PC-based simply-applied, memory test and quantification of the normative data in the Greek population

F.A. Sedaghat[1], A.A. Rakhshani[2], S.J. Baloyannis[1]
[1]Aristotelian University, School of Medicine, [2]Computer Science, University of Crete, Thessaloniki, Greece

Approximately 12-15% of MCI subjects per year convert to clinical dementia with functional disability. For this reason, our interest has been focused on the development of a simply-applied, short-duration standardized technique and quantification of normal cognitive function in the Greek population. A computer-based, cognitive test which is developed more by modifying standard paper-pencil tasks was made. This test measures multiple cognitive domains of memory, attention, concentration, executive function and spatial processing. The whole test lasts only up to15 minutes and is easy enough to be used by different age groups and education levels. It has a maximum total score of 150. 70 post-secondary-educated Greek individuals in different age groups (21 M, 49 F) with no cognitive complaints were volunteers for research testing. They were divided first into four age groups (20-39, 40-49, 50-59, 60-69), and then into 2 age groups (under 60Yr, Above 60 Yr). Normative data in different cognitive domains were evaluated. The 2 age groups differed significantly in memory score but not in attention score. Cronbach's Coefficient alpha of internal consistency was evaluated. The 5th percentile of total score in the whole group is 109. So a total score under this value (lower than -1.5 Z score) will be considered abnormal. This cognitive test is very simple to be performed by everyone. The second step is the validation of the test in larger normal groups and evaluating its discriminating power for MCI patients.

P2361

Necessity of a standard simply-applied cognitive test as a routine screening test for all adults

F.A. Sedaghat[1], A.A. Rakhshani[2], S.J. Baloyannis[1]
[1]Aristotelian University, School of Medicine, [2]Computer Science, University of Crete, Thessaloniki, Greece

There is a substantial risk of misclassifying normal adults as MCI patients or in turn, psychometrically misclassifying MCI in healthy older adults. So we tried to make a simply-applied, short-time-consuming memory test and used it in a group of cognitively healthy adults to check its importance in clinical use as a routine test.

A computer-based, cognitive test which is developed more by modifying standard paper-pencil tasks was made. This study examined 76 normal post-secondary-educated volunteers (20-78 years). 6 volunteers showed significantly lower total scores than the others (lower than 5th percentile, <-1.5 Z score) and also an MMSE of 27±1 and was categorized as group with abnormal score (AB). After the test they acknowledged a complaint of memory problems such as forgetfulness. These two groups independently of the age-adjusted score, differed significantly in most subsets of the test.

This group is suggested to be followed-up clinically with complete psychometrical tests to exclude the possibility of MCI. Also they should be tested more frequently and any fluctuations should be evaluated. In the case that this group show low memory scores in different sessions without significant fluctuation, the scores should be considered as base rates for future tests. As a conclusion we suggest to focus on the necessity of a standard simply-applied cognitive test as a routine screening test for all adults. Understanding the base rates of low scores can reduce the over-interpretation of low-memory scores as MCI thus minimize false-positive misclassification and vice versa.

P2362

Benton test results in patients with vertebrobasilar insufficiency

A. Koçer[1], E. Koçer[2], F.M. Domaç[3], S. Özdem[1], M. Eryılmaz[1]
[1]Neurology, Düzce University, [2]Psychiatry, Atatürk State Hospital, Düzce, [3]Neurology, Haydarpasa Numune Training Hospital, Istanbul, Turkey

Background: Decreased posterior cerebral circulation has been observed in patients with vertebrobasilar insufficiency (VBI). Reduced cerebral perfusion may have impact on mental performance such as the Benton test. We looked for the role of the Benton test in identifying cognitive decline in patients with VBI by correlating test performance with total blood flow measures of the vertebrobasilar system and other variables such as education level and gender.

Methods: 33 participants without dementia (MMSE >27), cranial MRI abnormality, and eye problems, but with atherosclerotic risk factors were involved in the study. 19 of them had a total vertebrobasilar flow volume less than 200ml/min with mean total blood flow=139.21±36.52ml/min (Group I) and 14 had more than 200ml/min with mean total blood flow=312.71±69.38ml/min (Group II). The groups were similar in aspects of gender, age and education levels. Benton test results were 19.53±3.12 and 22.36±2.73 for group I and II respectively (p=0.01). The education level was the main factor affecting Benton score in group I (p=0.04).

Conclusion: Benton test is clearly impaired in VBI measured by Doppler ultrasound examination. The test appears to discriminate cognitive levels adequately between VBI patients and others. Furthermore, further studies are needed to investigate the association between VBI and memory dysfunction in an earlier period of dementia.

P2363

Cognitive functions in alcohol-dependence

N. Nešić, S. Pejić
Consultative Clinical-Diagnostic Unit, Special Hospital on Addictions, Belgrade, Serbia

Objective: To explore the long-term effects of chronic, excessive alcohol consumption on cognitive functions in detoxified patients.
Patients and methods: The current study examined cognitive abilities in middle-aged (mean age=51.06; SD=7.63 years) abstinent alcoholic inpatients treated at the Special Hospital on Addictions in Belgrade. Patients with a history of cerebral trauma, neurological illness, severe hepatic failure and polysubstance abuse were excluded from the sample. 49 patients (3 women and 46 men) underwent comprehensive neuropsychological (NP) assessment after three-week abstinence. NP battery comprised Mini Mental State Examination (MMSE), Ray Complex Figure Test (RCF), Wisconsin Card Sorting Test (WCST), Hooper Visual Organisation Test (HVOT), Trail Making Test A and B (TMT A and B), Ray Auditory-Verbal Learning Test (RAVLT), BNT (Boston Naming Test) and Wechsler Adult Intelligence Scale (WAIS). Patients also underwent complete neurological examination.
Results: Cognitive testing revealed widespread cognitive impairments in almost all patients, dominantly affecting executive functions and attention, followed by decline in tests of constructional praxis, perception and visuospatial abilities. New learning deficits and language difficulty (mild degree of aphasia) were observed frequently.
Conclusions: Our results provide additional evidence for cognitive impairment of alcohol-dependent patients. In line with previous studies, executive functions were commonly affected suggesting frontal lobe dysfunction. In addition, our findings shed light on possible disturbances in parietotemporal areas. The possibility of cognitive limitations should be taken into account in planning treatment programs for alcoholism.

P2364

Tower of Hanoi and the new administration rules for effective executive functions diagnostics

R. Obereigneru[1,2], K. Obereigneru[2], S. Cakirpaloglu[1], E. Reiterova[1], P. Kanovsky[2]
[1]Department of Psychology, [2]Department of Neurology, Palacky University Olomouc, Olomouc, Czech Republic

Objective: Tower of Hanoi puzzle (ToH) is widely used as a neuropsychological tool to evaluate the integrity of the frontostriatal systems. Application is associated with planning ability and problem-solving task that reflects executive function (EF).
Methods: There was used a new way of application of ToH. We administrated three, four and five disk version in 5 minute limits for each version. The number of movements, solution time, perseverations and the frequency of the rule breaks were registered. The minimum number of moves for a solution is $2n - 1$, where n is the number of disks. The core test battery also includes neuropsychological tests for assessment cognitive functions, behavioural and personality changes. EF was assessed in three groups of patients with neurodegenerative diseases (Alzheimer's disease n=7, Parkinson's disease, n=10; non-specific group such as ALS, Huntington's disease, FTLD; n=10) and the control group (n=15).
Results: We found statistically significant differences in extended solution time in PD for motor complication ($p<0.01$), increased number of moves and rule breaks in AD ($p<0.01$).
Conclusion: This pilot study offers normative data for variant clinical groups by EF testing. Indices observed in ToH respect motor complication in PD and reflect the memory impairment in AD as well. We successfully set up the new administration rules and four indices for better quantification of executive functioning. Differing from the computerized version the wooden version of ToH brings advantages of clinical access.

P2365

Restraint stress attenuated compulsive behaviour in rats via GnRH: an experimental evidence for reduced compulsive behaviour in patients with post-traumatic stress disorder

S. Umathe[1], K. Bante[1], N. Jain[2]
[1]*College of Pharmacy, Nagpur University,* [2]*J L Chaturvedi College of Pharmacy, Nagpur, India*

Rationale: OCD is an anxiety-related disorder, which typically worsens during stressful periods. However, patients with post-traumatic stress disorder (PTSD) have less anxiety levels and behave differently. Present investigations were carried out in rats to test this phenomenon in PTSD state.
Material and methods: Stress was simulated by injecting CRF i.c.v., and PTSD state was generated by subjecting Sprague-Dawley rats to restraint stress. The marble-burying behaviour (MBB) of rats was then observed considering it as an index of OCD.
Results: CRF was found to dose dependently increase MBB, whereas restraint stress (1h) decreased MBB, with no change in locomotor activity. These observations substantiate the clinically observed behaviour of patients having PTSD. The literature documents nitric oxide (NO) is one of the neurotransmitters that implicates in OCD. We therefore estimated brain levels of nitric oxide in both groups by an amperometric method using NO measurement system fitted with aminoIV sensor. The results indicated that higher levels of NO in both the groups make it difficult to relate it with the changes in MBB. Hence, we tested the role of GnRH, as it is a behavioural antagonist of CRF and lowers NO levels. These studies revealed that leuprolide (GnRH agonist) attenuated the effect of CRF whereas antide (GnRH antagonist) attenuated the post restraint stress-induced inhibition of MBB.
Conclusion: CRF aggravated while restraint stress attenuated compulsive behaviour in rats which may be mediated via NO induced changes in GnRH levels.

P2366

Glutamate and aspartate levels in the cerebrospinal fluid of a patient with primary progressive aphasia

A.P. Galanopoulos[1], A. Polissidis[1], M. Xifaras[2], Z. Papadopoulou-Daifoti[1]
[1]*Department of Pharmacology, Athens University Medical School,* [2]*Department of Neurology, 'Pammakaristos' General Hospital, Athens, Greece*

Objective: To investigate the role of glutamate and aspartate in primary progressive aphasia, a rare neurodegenerative disorder.
Case report: The patient reported here is a 60-year-old female with primary progressive aphasia. The disease started two years before her first visit to the department, with slight difficulties in word finding. Language and speech problems were getting progressively more severe in the course of the disease, comprehension impairment was added and at the time of first evaluation the patient suffered from serious aphasia, of both motor and sensory type. Clinical examination showed no other cognitive deficit and absence of focal signs. MRI scanning revealed a significant unilateral atrophy of the left perisylvian grey matter, without any parenchymal brain lesion. Electroencephalogram was normal. CSF investigation documented normal levels of glucose and protein, absence of leucocytes and negative virus immunological screening. Glutamate and aspartate levels were measured in HPLC. Glutamate was found significantly elevated (5.24μM), comparing with normal titres reported in literature (≈1μM), while aspartate levels were comparable to normal (1.08μM). The diagnosis was based on medical history and clinical, laboratory and neuroradiological findings.
Conclusion: Primary progressive aphasia is a rare neurodegenerative disorder. Glutamate, aspartate and other excitatory aminoacids may play a crucial role in neurodegeneration. Recent data suggest that elevation in glutamate- and not aspartate-levels may relate to the pathogenesis of neurodegeneration, a hypothesis also supported by the results presented here.

P2367

Abstract cancelled

P2368

Cognitive disorders in occupational chronic mercury intoxication

E.V. Katamanova, O.L. Lakhman, O.I. Shevchenko
Institute of Occupational Health and Human Ecology, Siberian Branch of the Russian Academy of Medical Sciences, Angarsk, Russia

P2369

Behçet's Syndrome comorbid with bipolar disorder: a case report

D.H. Ertem[1], O. Sahmelikoglu[2], H. Sariahmetoglu[1], N. Tumay[2], F. Maner[2], O. Hisim[2]
[1]Neurology, [2]Psychiatry, Bakirkoy Research and Training Hospital for Psychiatric and Neurological Diseases, Istanbul, Turkey

P2370

Short neuropsychological tests in the diagnosis of minimal hepatic encephalopathy in the Polish population

G. Opala[1], A. Gorzkowska[1], J. Hartleb[2], B. Jasinska-Myga[1]
[1]Department of Neurology, Silesian Medical University, [2]Department of Internal Medicine, St. Elisabeth Hospital, Katowice, Poland

P2371

Evaluation of cognitive functions in diabetic patients

I. Kozub-Doros, K. Pierzchala, B. Labuz-Roszak, K. Strojek
Dept of Neurology, Medical University of Silesia, Zabrze, Poland

P2372

Reflexions on the analytic treatment of production in some aphasics patients related with other cognitive deficits

S. Gjeci, S. Xhaxho, J. Kruja
University Service of Neurology, UHC Mother Theresa, Tirana, Albania

P2373

Abstract cancelled

P2374

Elevated C-reactive protein is related to vascular cognitive impairment in middle-aged men

N.I. Zakharova, O.V. Tikhomirova, V.V. Kogevnicova, N.N. Zybina, V.V. Kindyashova
The Nikiforov Russion Center of Emergency and Radiation Medicine, Saint Petersburg, Russia

Multiple sclerosis 2

P2375

Consistent reductions in MRI activity with cladribine tablets therapy for patients with relapsing-remitting multiple sclerosis in the CLARITY study

G. Comi[1], S. Cook[2], G. Giovannoni[3], K. Rammohan[4], P. Rieckmann[5], P. Soelberg-Sørensen[6], P. Vermersch[7], A. Hamlett[8], B. Musch[8], T. Fevr[8], V. Viglietta[8], S.J. Greenberg[8], CLARITY Study Group
[1]Department of Neurology and Institute of Experimental Neurology, Università Vita-Salute San Raffaele, Milan, Italy, [2]New Jersey Medical School, University of Medicine and Dentistry, Newark, NJ, USA, [3]Blizard Institute of Cell and Molecular Science, Barts and the London School of Medicine and Dentistry, London, UK, [4]Ohio State University, Columbus, OH, USA, [5]Bamberg Hospital / University of Erlangen, Bamberg, Germany, [6]Danish MS Research Center, Copenhagen University Hospital, Rigshospitalet, Copenhagen, Denmark, [7]University of Lille-Nord de France, Lille, France, [8]Merck Serono S.A., Geneva, Switzerland

Introduction: The 96-week, double-blind CLARITY study demonstrated significant clinical and radiological efficacy of short-course treatment with cladribine tablets for patients with relapsing-remitting multiple sclerosis (RRMS), including reductions in T1 gadolinium-enhancing (Gd+) lesions, active T2 lesions and combined unique (CU) lesions from serial MRI. A conservative imputational approach was applied for patients who had no post-baseline data.
Objective: To compare results obtained using observed data vs. imputed data to determine the impact on MRI outcomes.
Methods: MRI scans obtained over 96 weeks in the CLARITY study were analyzed without imputation for 424, 423 and 443 patients treated with placebo, 3.5 or 5.25mg/kg cladribine tablets, respectively (ITT-observed) and compared to results obtained using an imputational method (ITT-imputed).
Results: Mean T1 Gd+, active T2 and CU lesions/patient/scan over 96 weeks were significantly reduced for the ITT-imputed (relative reductions vs. placebo 73.4-87.9%; $p<0.001$) and ITT-observed (71.3-86.8%; $p<0.001$) analyses; reductions in lesion counts emerged at week 24 and were sustained at week 96. In addition, significantly higher proportions of patients in 3.5 and 5.25 mg/kg cladribine tablets remained free of T1 Gd+, T2 or CU lesions over 96 weeks compared with the placebo group, when analyzed by either method (ITT-observed or ITT-imputed) (all $p<0.001$).
Conclusions: These findings highlight the robustness of the significant reductions in MRI activity in the CLARITY study, supporting short-course therapy with cladribine tablets as a promising therapeutic option in RRMS.
Study supported by: Merck Serono S.A. – Geneva, Switzerland, an affiliate of Merck KGaA, Darmstadt, Germany.

P2376

Metabolic alterations and atrophy of the gray (GM) and white matter (WM) in patients with clinically isolated syndrome (CIS): a 1H MRS and MRI volumetric study

Z. Rozhkova[1], T. Nehrych[2], A. Khoma[2], T. Kobys[3], E. Dolia[1]
[1]Radiology, Medical Clinic 'BORIS', Kiev, [2]Neurology, L'viv Medical University, L'viv, [3]Neurology, Ukrainian Centre of Multiple Sclerosis, Kiev, Ukraine

Objectives: We propose quantitative approach for evaluation metabolic alterations and cerebral atrophy in patients with CIS.
Methods: MRI and 1H MRS were performed in 23 patients with CIS (16-43y, disease duration 3-6y) and in 10 volunteers (23-40y) with 1.5T SIGNA EXCITE (GE). MRI data were obtained by pulse sequences: T2/PD, FLAIR, T1SE (pre-, post-contrast), 3DSPGR. Using images recorded before and after contrast injection (7.5ml Gadovist) the plaques were defined. 1H spectra were recorded with the 2DCSI STEAM:TR/TE=3000/144ms.
Results: From analysis of MRI in patients with CIS an increase of ventricular volume (+40%, $p=0.005$) and decrease of cerebral volume (-2%) were obtain. Total brain atrophy were obtained correlated with GM atrophy. From analysis of MR spectra the mean values of NAA/Cr, NAA/Cho, and Cho/Cr ratios were obtained. In the black holes localized in the WM the mean values of NAA/Cr=1.47, and in the GM NAA/Cr=1.76. In the black holes localized in the WM the mean values of Cho/Cr=3.93, and in GM Cho/Cr=2.46. In the black holes localized in the WM
the mean values of NAA/Cho=0.93, and in GM NAA/Cho=0.84. We found out correlation between Cho/Cr and NAA/Cho ratios with GM atrophy, and also correlation of NAA/Cr with WM atrophy. GM atrophy explains clinical disability better than WM atrophy.
Conclusion: Bringing together volumetric and MRS data confirms axonal damage and GM atrophy in patients with CIS. The volume of the black holes in WM predicted GM atrophy, which indicates that WM axonal damage is at least partially responsible for the GM atrophy in patients with CIS.

P2377

Responsiveness of the Multiple Sclerosis International Quality of Life (MusiQOL) questionnaire to changes in disability in patients with multiple sclerosis: 12-month results

P. Auquier[1], O. Fernández[2], H. Butzkueven[3], P. Flachenecker[4], E. Idiman[5], J. Pelletier[6], S. Stecchi[7], D. Issard[8], M.-C. Simeoni[1]

[1]Department of Public Health, Timone University Hospital, Marseille, France, [2]Hospital Regional Universitario Carlos Haya, Malaga, Spain, [3]MS Clinical and Research Unit, The Royal Melbourne Hospital, Melbourne, VIC, Australia, [4]Department of Neurology, University of Würzburg, Würzburg, Germany, [5]Department of Neurology, Dokuz Eylül University, Izmir, Turkey, [6]Department of Neurology, Timone University Hospital, Marseille, France, [7]Centro SM, Villa Mazzacorati, Bologna, Italy, [8]Global Biostatistics, Merck Serono S.A., Geneva, Switzerland

Background: Routine clinical assessment of multiple sclerosis (MS) usually focuses on neurological disability (Expanded Disability Status Scale [EDSS] score), overlooking non-physical symptoms and quality of life (QoL). The MS International QoL (MusiQoL) questionnaire is a multidimensional, patient-rated instrument, validated in 14 languages.

Objective: To assess the responsiveness of MusiQoL to changes in EDSS score in patients with MS.

Methods: Patients (≥18 years; MS diagnosis [McDonald/Poser criteria]; EDSS score ≤7.0, able to complete MusiQoL) were recruited to the multicentre, observational MusiQoL Responsiveness Study. MusiQoL (0-100 [worst to best] scale) and EDSS scores were collected at baseline and every 6 months for up to 2 years. Primary endpoint: change in MusiQoL index score from baseline to month 24 (including effect size) for 'worsened' and 'non-worsened' (EDSS score) patients; interim results are based on 12-month analyses.

Results: Overall, 600 patients (12 countries) were enrolled. The primary analysis population comprised 474 patients (mean [SD] age: 41.1 [10.1] years; 72.2% women; 87.6% relapsing-remitting MS: mean [SD] EDSS score: 2.9 [1.9]). At month 12, 68/474 patients (14.3%) had worsened (EDSS score); mean (SD) change in MusiQoL index score was 0.48 (10.99), -1.00 (9.88) in 'worsened' and 0.72 (11.16) in 'not-worsened' patients; effect sizes were 0.03, -0.08 and 0.05, respectively.

Conclusion(s): This 12-month analysis revealed small changes in MusiQoL index scores in the expected direction, decreasing for 'worsened' and increasing for 'not-worsened' patients. Results are to be confirmed at 24 months.

Study supported by: Merck Serono S.A. – Geneva, Switzerland, an affiliate of Merck KGaA, Darmstadt, Germany.

P2378

Associations of MRI-lesions and clinical features with disability in Chinese patients with multiple sclerosis

X.-J. Cheng[1], Q. Cheng[1,2], L. Miao[3], Z.-L. Guo[1], Y.-T. Guan[4], Z.-G. Liu[5], X. Wang[6], X.-J. Sun[7], Z.-X. Zhao[8], Y.-J. Song[1], X.-Y. Ding[9], G.-X. Jiang[10], S.-D. Chen[1], S. Fredrikson[11]

[1]Department of Neurology, Ruijin Hospital, Medical School of Shanghai Jiao Tong University, [2]School of Public Health, Shanghai Jiao Tong University, [3]Department of Neurology, Renji Hospital, Medical School of Shanghai Jiao Tong University, [4]Department of Neurology, Shanghai Hospital, Second Military Medical University, [5]Department of Neurology, Xinhua Hospital, Medical School of Shanghai Jiao Tong University, [6]Department of Neurology, Zhongshan Hospital, Fudan University, [7]Department of Neurology, Shanghai No. 6 People's Hospital, Shanghai Jiao Tong University, [8]Department of Neurology, Changzheng Hospital, Second Military Medical University, [9]Department of Radiology, Ruijin Hospital, Medical School of Shanghai Jiao Tong University, Shanghai, China, [10]Department of Public Health Sciences, Karolinska Institute, [11]Division of Neurology, Karolinska Institute, Karolinska University Hospital, Stockholm, Sweden

We analyzed associations of MRI-lesions and clinical features with disability in patients with multiple sclerosis (MS) in Shanghai, China. Patients with MS in the study were identified from a survey in Shanghai, whose sites of lesions in the CNS based on the results from MRI examinations were evident. Associations between MRI-lesions, various clinical variables and the severity of disability were analyzed with univariate and multivariate logistic regression analysis. There were 210 (88 male and 122 female) patients with MS in our analysis. MRI-lesions were found in the brain in 120 patients; in the spinal cord, 49 patients; and in both the brain and the spinal cord in the other 41 patients. Variables of current age (OR: 1.041, 95% CI: 1.007~1.077), MS duration (OR: 1.082, 95% CI: 1.011~1.159) and MRI-lesions in the spinal cord (OR: 2.441, 95% CI: 1.039~5.737) were left in the final model of multivariate logistic regression analysis for associations with the severity of disability. Our findings indicate that MRI-lesions in the spinal cord were associated with worse disability than cerebral MRI-lesions. An older age, a longer MS duration and MRI-lesions in the spinal cord were significantly associated with a more severe disability. Further longitudinal investigations are needed to evaluate the prognosis of patients with MS in China.

P2379

Factors determining quality of life in an international population of patients with multiple sclerosis: assessment using the MusiQOL and SF-36 questionnaires

O. Fernandez[1], K. Baumstarck-Barrau[2], M.-C. Simeoni[2], P. Auquier[2], The MusiQoL Study Group
[1]*Institute of Clinical Neurosciences, Hospital Regional Universitario Carlos Haya, Málaga, Spain,* [2]*Department of Public Health, Timone University Hospital, Marseilles, France*

Background: Multiple sclerosis (MS) can have psychological and socioeconomic consequences that can affect patients' quality of life (QoL) as much as physical disability. Small patient populations, focussing on MS subtypes, restrictions on potential predictors investigated, and use of generic instruments have limited identification of QoL predictors.
Objective: To determine the clinical and sociodemographic factors affecting QoL in a large international study using the MS International QoL (MusiQoL) questionnaire.
Methods: Patients aged ≥18 years with a diagnosis of MS for ≥6 months were enrolled. Sociodemographic and clinical MS data were recorded; MusiQoL and SF-36 were administered.
Results: In total, 1992 patients from 15 countries were enrolled (mean [SD] age: 42.3 [12.6] years; 70.5% women). Most patients had relapsing-remitting (70.4%) or secondary progressive (21.0%) MS. Higher educational level, active employment, younger age, lower Expanded Disability Status Scale (EDSS) score, absence of cognitive symptoms, clinically isolated syndrome (all $p<0.001$); having a partner ($p<0.02$); and longer time since last relapse ($p=0.018$) were associated with higher QoL. Multivariate analysis identified lower educational level, higher EDSS score, cognitive dysfunction, and time since last relapse as significant predictors of lower MusiQoL index scores. In contrast, gender, age, educational level, and cognitive dysfunction were not identified as QoL predictors on the SF-36.
Conclusion(s): Sociodemographic and clinical factors are major drivers of QoL in patients with MS. Although addressing socioeconomic factors that reduce QoL is difficult, appropriate clinical intervention may considerably improve QoL.
Study supported by: Merck Serono S.A.-Geneva, Switzerland, an affiliate of Merck KGaA, Darmstadt, Germany.

P2380

Cigarette smoking as a predictor for change in disability in multiple sclerosis patients: a 6-year follow-up study in Belgrade (Serbia)

D. Kisic Tepavcevic[1], J. Kostic[2], N. Stojsavljevic[2], I. Dujmovic Basuroski[2], S. Mesaros[2], T. Pekmezovic[1], J. Drulovic[2]
[1]*Institute of Epidemiology, University of Belgrade,* [2]*Institute of Neurology, Belgrade, Serbia*

Objective: The objective of this study was to determine the predictive value of cigarette smoking for change in physical disability in MS patients after a 6-year follow-up.
Methods: A panel study has been performed on 98 patients who fulfil following inclusion criteria: MS (McDonald's criteria), age 18-60 years, EDSS<8, and written informed consent. Exclusion criteria were: exacerbation of the disease in the last month, any pre-existing major chronic illness and psychiatric disorders, and antidepressive or corticosteroid therapy in the last month. The neurological impairment was assessed using Kurtzke's Expended Disability Status Scale (EDSS). Student's t-test for dependent samples was used to detect a change in EDSS score after a period of 6 years. The linear regression models were constructed to evaluate the predictive value of cigarette smoking on development of disability 6 years later.
Results: At the beginning of the study the frequency of smokers among 98 MS patients was 40.8%. The mean EDSS score was 4.4, at baseline, and 5.3, six years after ($t=-8.257$; $p<0.001$). The linear regression models revealed that after controlling for potential confounders (baseline scores of EDSS, gender and sex), the baseline smoking status showed independent predictive value on development of physical disability in our sample of MS patients (standardized beta=-0.591; $p=0.001$).
Conclusion: This study has shown that cigarette smoking is an independent but modifiable risk factor for progression of physical disability in patients with MS. Therefore, the recommendation to stop smoking should be considered in the health-care counselling of these patients.

P2381

Value of interleukin 1 polymorphisms as prognostic marker of efficacy of interferon beta-1b in relapsing-remitting multiple sclerosis

J.A. Garrote[1], A.L. Guerrero[2], D. Pérez[3], A. Mendoza[4], J.T. López-Alburquerque[5], J.C. Morán[6], A.B. Guerrero[1], D. Bernardo[1], A.B. Caminero[7], J. Martín-Polo[8], S. Merino[8], H. Alonso[9], C. Jiménez[6], J.J. Ruiz-Ezquerro[9], E. Arranz[1]

[1]IBGM. University of Valladolid, [2]University Hospital, Valladolid, [3]Hospital del Bierzo, Ponferrada, [4]Hospital General de Segovia, Segovia, [5]University Hospital, Salamanca, [6]Hospital General de Soria, Soria, [7]Hospital Virgen de Sonsoles, Ávila, [8]Hospital Río Carrión, Palencia, [9]Hospital Virgen de la Concha, Zamora, Spain

Objectives: To assess whether cytokine-coding genes might have a prognostic value as markers of response to treatment with Interferon beta-1b (INFB1b).
Methods: Open, multicentre, prospective, observational study, conducted in 7 hospitals belonging to SACYL Public Health Network (Castilla y León Autonomous Community, Spain). Inclusion criteria: diagnosis of relapsing-remitting MS (RRMS), age above 18, EDSS 0-6.5, two or more relapses in the previous three years, naïve status beginning treatment with INFB. Polymorphisms of TGFB1, IL10, IL4, IL4RA, IL1B (transition T-C in position -889, T-C in -511, T-C in -3962 and T-C in -1970), IL1RA, IL12B, IFNG, TNFA, IL2, IL6 and CTLA4 were determined. After 2 years follow-up, patients were classified as responders or non-responders based upon clinical criteria, relied on the presence of relapses, increase of disability, or both. Correlation between responding status with each polymorphism was tested.
Results: 24 patients (mean age 35.4, 58% female) were included. 56.5% were considered responders (neither relapse nor disability increasing). We observed an increase in the C/C genotypes of IL1B-1098 (OR: 9.09, p:0.06, age corrected) in the responders group. C/C genotype predicts a good response to IFNB1b with a sensitivity of 54%, a specificity of 89%, a predictive value of positive result of 88%, a pre-test probability of 59%, post-test probability of 88% and post-test probability of negative of 43%.
Conclusion: These results indicate that polymorphic variations of pro-inflammatory cytokine IL1B might play a role as a prognostic marker of efficacy of INFB1b in RRMS in our population.

P2382

Changes in the normal appearing white and grey matter and cognitive impairment in clinically isolated syndrome

M. Koçak

Neurology, Marmara University, Istanbul, Turkey

Objective: We aim to assess the normal appearing white and grey matter changes in CIS patients and their correlations if present to neurocognitive tasks. Those changes can be revealed by magnetization transfer imaging (MTI) and Diffusion-tensor magnetic imaging (DTI) technique.
Method: DTI and MTI measurements at normal appearing left-right dorsolateral prefrontal cortex, right-left anterior cingulate gyrus, corpus callosum genu-splenium were made. In order to assess whether or not the cognition was affected following neurocognitive tests [Wisconsin Card Sorting Test (WCST), California Verbal Learning Test (CVLT), Stroop Test (ST), and Digit Range (DR)] were performed in 16 patients with CIS and of 16 demographically matched controls.
Result: Patients were found to have a lower fractional anisotropy (FA) compared with the controls in the left dorsolateral prefrontal cortex at DTI technique (p: 0.019). Neurocognitive assessment showed that patients did not perform well in
WCST (p: 0.029), CVLT (p: 0.001), ST (p: 0.002), DR (p: 0.002). Those results were associated with abnormal FA in the left dorsolateral prefrontal cortex.
Conclusion: Results showed the presence of deficits of executive function such as attention, working memory, strategy formulation, and monitoring ongoing mental activity and speeded information processing (frontal functions) in clinically isolated syndrome patients. The cognitive tests were found to be associated with the localization of the lesions in the frontal lobe. These findings suggest that in CIS, overall microscopic brain damage is important, even in determining the deficits of selective cognitive domains.

P2383

Treatment options of spasticity in multiple sclerosis patients

A. Ilic, S. Vojinovic
Department of Neurology, Clinical Centre, Nis, Serbia

Background: Spasticity is an extremely common symptom related to multiple sclerosis (MS), responsible for the disability of affected persons.
Objective: To characterize the MS patients admitted to our hospital suffering from spasticity, and to evaluate treatment patterns, including intrathecal baclofen (ITB) delivery.
Method: We evaluated 271 patients with clinical definite MS (McDonald´s criteria), treated on Neurology department. 96 patients (35.4 %) had no spasticity; 33 (12.2%) minimal, that did not need treatment; 100 (36.9%) had mild, Ashworth score 2, 34 patients treated; 33 patients (12.2%) with moderate spasticity, Ashworth score 3; 9 (3.3%) had Ashworth score 4. 8 patients with severe spasticity were treated with ITB (no improvement with previous high doses of oral medications), the rest with tizanidine, tolperisone or baclofen orally. For clinical evaluation Expended Disability Status Scale (EDSS), Ashworth scale, clonus scale and Penn spasmus scale were used. Spasticity was assessed on the first day and after two months, for ITB patients 6 months after implantation. For statistics, Wilcoxon test was done.
Results: Oral medications in patients with mild spasticity significantly reduced muscle tone and clonus (N=34, $p<0.01$).In patients with spasticity scored 3 on Ashworth scale significant improvement was found for muscle tone, clonus and muscle spasms (N=33, $p<0,01$).Patients with ITB delivery had significant improvement of muscle tone, reducing muscle spasms and clonus (N=8, $p<0.05$).
Conclusions: Oral antispastic drugs demonstrated significant improvements in mild or moderate spasticity. Our initial experiences confirmed ITB as a safe and effective therapeutical option for the treatment of intractable spasticity in MS patients.

P2384

Cerebrospinal fluid and serum total-tau and phospho-tau (181P) in patients with multiple sclerosis - correlation of serum phospho-tau (181P) with disease severity

H. Bartosik-Psujek[1], J. Jaworski[1], M. Psujek[2]
[1]Department of Neurology, Medical University of Lublin, [2]2nd Department of Anaesthesiology and Intensive Care, Medical University of Lublin, Lublin, Poland

Introduction: Extensive research is performed in order to find surrogate markers of disease severity and prognosis in multiple sclerosis (MS). Global Multiple Sclerosis Severity Scale (MSSS) incorporates disability expressed in EDSS and disease duration to help predict outcome in MS group.
Materials and methods: Serum and CSF samples were collected from 78 patients with multiple sclerosis diagnosed according to revised McDonald criteria (relapsing-remitting course in 57 cases and secondary progressive course in 21 cases). Total-tau (t-tau) and phosphoThr181-tau (p-tau) were measured in serum and CSF with commercially available INNOTEST kits from Innogenetics. Albumine and immunoglobulins (IgG, IgA, IgM) concentrations in CSF and serum were measured with immunonephelometric method in Behring Nephelometer 100 system. Linear regression was used to delineate correlations.
Results: In serum T-tau level was detectable in 31/78 cases (39.7% of all measurements). In contrary p-tau serum concentration was detectable in 69/78 cases (88.5% of all measurements). Significant non-zero positive slope relation was detected between IgM index and p-tau in serum ($R^2=0.79$; $p<0.0001$). Significant non-zero positive slope was also found for Q IgM/serum p-tau relation ($R^2=0.6$; $p<0.0001$). Global MSSS correlated positively with serum p-tau ($R^2=0.09$; $p=0.01$) and Q IgG ($R^2=0.08$; $p=0.02$).
Conclusion: P-tau in serum was found to correlate positively with disease severity expressed both as MSSS and as indices of intrathecal IgM synthesis.

P2385

Treatment of multiple sclerosis with cyclophosphamide

Ü. Türk Börü[1], S. Yıldırım[1], M. Taşdemir[2], S. Alp[3], H. Erdoğan[1]
[1]Kartal Dr Lütfi Kırdar Training and Research Hospital, [2]Marmara University, Istanbul, [3]Kafkas University, Kars, Turkey

Background: Cylophosphamide has been used in treatment for multiple sclerosis (MS) for the past 30 years and in selected cases of progressive or worsening MS. We aimed to determine the effect of cyclophosphamide treatment in worsening relapsing-remitting (RR) and progressive (SP) MS.
Methods: Male and female patients, 26-66 years of age with RR and SP MS and with Expanded Status Scale (EDSS) ≥2.0, were enrolled in the study. We patients with worsening form of RRMS. The patients were treated for at least 1 year by intravenous (IV) monthly pulse of CYC (800mg/m2). Impairment and disability were assessed using EDSS at base line and every month after the beginning of the treatment.
Results: 49 patients were treated with cyclophosphamide; 21 patients were male, 28 were female. 27 patients had RRMS, 22 had SPMS. The mean EDSS scores of patients were 5.8 at the beginning of the treatment, 5.1 at the first year and 5.2 at the second year. Mean relapse rate before treatment in RRMS group was 3.0; 0.2 both first year and second year. The decrease of EDSS in both groups of patients was statistically significant at the end of first and second years. The decrease of relapse rate was also statistically significant at the first and second year.
Conclusion: 30 years of experience with cyclophosphamide suggests that it is efficacious in MS at the earlier stage of the disease when there is rapid progression.

P2386

Frequency of pain in multiple sclerosis patients

J. Savic[1], S. Grgic[2], I. Marjanovic[1], D. Kisic Tepavcevic[3], T. Pekmezovic[3], J. Drulovic[1]
[1]Institute of Neurology, Clinical Center of Serbia, Belgrade, Serbia, [2]Department of Neurology, Clinical Center Banjaluka, Banja Luka, Bosnia-Herzegovina, [3]Institute for Epidemiology University Scholl of Medicine Belgrade, Belgrade, Serbia

Objectives: We analysed frequency and type of the different painful syndromes (dysesthetic pain, trigeminal neuralgia, Lhermitte's sign, musculoskeletal pain and headache) in patients with multiple sclerosis (MS).
Methods: In a cross-sectional study, we assessed pain in patients with MS using a symptom-oriented approach. A semi-structured questionnaire was administered during a face-to-face interview with 314 consecutive MS outpatients followed-up over a 6-month period, at the Department of multiple sclerosis, Institute of Neurology, Clinical Center of Serbia, Belgrade, and Clinic of Neurology, Clinical Centre of Banja Luka.
Results: The mean age of the patients was 39.5 years, and female/male ratio was 2.5. The mean disease duration was 8.6 years and the median Expanded Disability Status Scale was 3.0. Most of the patients were affected by the relapsing-remitting form of the disease (80.5%), while the remaining 19.5% suffered from secondary progressive MS and primary progressive MS. Lifetime prevalence at the date of examination of at least one type of neuropathic pain was 68.2% in MS patients, while the actual prevalence was 42.7%. Pain and frequencies included dysesthetic pain 44.3%, Lhermitte's sign 18.5 %, musculoskeletal (painful tonic spasms, low back pain) in 24.3%, headache in 32.3%.
Conclusion: Our results present initial data of a study which suggest high frequency of pain in our MS patients. These findings emphasize the necessity of pain evaluation in MS patients for a more specific treatment.

P2387

Is cognitive dysfunction in relapsing-remitting multiple sclerosis patients related to Beta-Nerve Growth Factor deficiency?

A. Kalinowska-Lyszczarz[1], M.A. Pawlak[2], S. Michalak[3,4], J. Losy[1,4]

[1]Department of Clinical Neuroimmunology, Chair of Neurology, [2]Department of Neurology and Cerebrovascular Disorders, [3]Department of Neurochemistry and Neuropathology, Chair of Neurology, Poznan University of Medical Sciences, [4]Neuroimmunological Unit, Institute of Experimental and Clinical Medicine, Polish Academy of Sciences, Poznan, Poland

Introduction: Multiple sclerosis (MS) is a chronic inflammatory demyelinating and neurodegenerative disease of the central nervous system (CNS), causing cognitive impairment in approximately half of the patients. Since beta-nerve growth factor (NGF) has been implicated in memory acquisition and retention, we hypothesize that it has a neuroprotective role in MS, especially in the cognitive domain.

Patients and methods: Beta-NGF levels were measured in serum and in peripheral blood mononuclear cells fraction (PBMCs) by ELISA method in 40 patients (15M/25F) with clinically definite relapsing-remitting MS (RRMS). They were all subject to neuropsychological examination which included: computerized Simple Reaction Time (RT) test, spontaneous word list generation tests, 15-Word List Recall Test, pattern recognition, attention to detail, visual digit span, auditory digit span, Raven's Coloured Progressive Matrices and versions A and B of Trail Making Tests. Samples and tests were taken during remission phase in all patients.

Results and discussion: In linear regression model NGF concentration in PBMCs failed to reach statistical significance ($p < 0.05$) in relationship to neuropsychological variables assessed in this study. This might result from a small effect size or the fact that growth factor concentration is measured in a pool of PBMCs and not within brain parenchyma. It might be suspected that cognitive functions decline slowly over time, while NGF production by immune cells varies significantly during disease course, thus their interrelationship is expected to be non-linear and complex. More studies are needed to elucidate the neuroprotective role of beta-NGF in MS pathology.

P2388

Inhibiting poly (ADP-ribose) polymerase (PARP): a potential therapy against oligodendrocyte death and demyelination in multiple sclerosis

S. Veto[1], P. Acs[1], J. Bauer[2], H. Lassmann[2], Z. Berente[1], G. Setalo Jr[1], B. Sumegi[1], S. Komoly[1], F. Gallyas Jr[1], Z. Illes[1]

[1]University of Pecs, Hungary, [2]Medical University of Vienna, Austria

Mitochondrial dysfunction is supposed to play a role in loss of oligodendrocytes in multiple sclerosis (MS). A nuclear-mitochondrial crosstalk dependent on poly(ADP-ribosyl)ation is critical in determining the fate of injured cells. We investigated activation of PARP in MS lesions, and the effect of PARP inhibition on experimental demyelination. Strong poly-ADP-rybose (PAR) reactivity reflecting activation of PARP was observed in the nucleis of oligodendrocytes in pattern III MS lesions in contrast to pattern II MS and controls. Apoptosis inducing factor (AIF) co-localized with anti-PAR staining in condensed nuclei. The same pathology was observed in a demyelinating animal model induced by cuprizone: PARP activation in corpus callosum (CC); apoptosis with enlarged mitochondria in oligodendrocytes; caspase-independent apoptosis with the nuclear translocation of AIF and strong nuclear anti-AIF immunostaining of oligodendrocytes in the CC. In addition, 4-hydroxyquinazoline (4HQ), a potent inhibitor of the enzyme attenuated oligodendrocyte depletion and decreased demyelination indicated by in vivo serial 9T MRI, and in vitro quantitative MBP immunoblotting/ immunohisto-chemistry. PARP inhibition suppressed JNK and p38 MAP kinase phosphorylation, increased the activation of the cytoprotective PI-3/Akt pathway and prevented caspase-independent AIF-mediated apoptosis. In summary, PARP activation plays a crucial role in the pathogenesis of pattern III MS lesions. Inhibition of PARP effectively suppressed demyelination in an experimental model similar to pattern III MS. Since PARP inhibition was also effective in the inflammatory model of MS, it may target all subtypes of MS: either by preventing oligodendrocyte death or attenuating autoimmune inflammation.

P2389

Sexual dysfunction in patients with clinically isolated syndrome multiple sclerosis: a pilot study

A. Hufn, J. Doláková, J. Mareš, P. Kaňovský
Dep. of Neurology, University Hospital and Palacky University Medical School, Olomouc, Czech Republic

Introduction: A clinically isolated syndrome (CIS) refers to a first acute episode suggestive of CNS demyelination. Within two years of the CIS are met in McDonald diagnostic criteria for multiple sclerosis (MS) in 85% of patients with CIS. Many of the symptoms of CIS may affect human sexuality. Some recent studies indicate the presence of sexual dysfunction in 65-90% patients with MS. However authors did not find any data in patients with CIS. Aim of the study was to assess the prevalence of sexual dysfunction in patients with CIS.
Methods: The patient group consisted of 40 subjects (30 females aged from 21 to 48 years and 10 males aged from 24 to 51 years. All subjects fulfilled the criteria for CIS. Data were collected through structured questionnaires for the international evaluation of sexual dysfunction. International Index of Erectile Function (IIEF), evaluating the incidence and degree of erectile dysfunction, orgasmic disorder and sexual desire, was used in males. Modified version of the IIEF questionnaire, Female Sexual Function Index (FSFI), detecting various types of sexual dysfunction (sexual desire disorder, dysparenurie, vaginism), were used in females.
Results: The rate of sexual dysfunction was assessed using the 5-point scale for each subtype of sexual dysfunction. Sexual dysfunction was assessed in 19 subjects (45%). Higher incidence was found in females.
Conclusion: Results of this study confirmed the high incidence of sexual dysfunction in patients with CIS. The results are a positive indicator of good cooperation of patients even in delicate areas such as human sexuality.

P2390

SURPASS study will evaluate the benefits associated with switching MS therapy

H.-P. Hartung[1], P.K. Coyle[2], R.A. Rudick[3], O. Garcea[4], D.H. Miller[5], P.W. O'Connor[6], P. Vermersch[7], F. Lynn[8], S. Jurgensen[8], E. Aycardi[8]
[1]Department of Neurology, Heinrich-Heine University, Dusseldorf, Germany, [2]MS Comprehensive Care Center, State University of New York at Stony Brook, New York, NY, [3]Mellen Center for Multiple Sclerosis Treatment and Research, Cleveland Clinic, Cleveland, OH, USA, [4]Neuroimmunology Unit, Hospital J.M. Ramos Mejía, Buenos Aires, Argentina, [5]Department of Neuroinflammation, UCL Institute of Neurology, London, UK, [6]Division of Neurology, St. Michael's Hospital, Toronto, ON, Canada, [7]University of Lille Nord de France, Lille, France, [8]Biogen Idec, Cambridge, MA, USA

Background and aims: Glatiramer acetate (GA) and interferon beta (IFNβ) are effective first-line MS therapies. However, some patients with relapsing-remitting MS (RRMS) continue to experience disease activity despite treatment with these agents. There is no class I evidence to help guiding treatment decisions in these patients, and no studies have directly compared GA or IFNβ with natalizumab. The SURPASS study will compare the efficacy of switching from GA or SC IFNβ-1a to natalizumab or between alternative comparator drugs, or maintaining current treatment.
Methods: SURPASS is a randomized, open-label, active-comparator, rater-blinded study. Patient inclusion criteria include RRMS diagnosis, age 18-60 years, Expanded Disability Status Scale score ≤5.5, and disease activity (≥1 clinical relapse or ≥2 new MRI lesions [Gd+ and/or T2 hyperintense]) during the first 6-18 months receiving GA or SC IFNβ-1a. Approximately 1800 patients will be randomized 2:1:1 to receive natalizumab 300mg IV every 4 weeks, GA 20mg SC once daily, or IFNβ-1a 44μg SC 3 times weekly for a minimum of 12 months, up to 24 months. The primary endpoint is annualized relapse rate. Other endpoints include change in T2 lesion volume, patients free of disease activity, quality of life, safety, and tolerability.
Conclusions: SURPASS will provide class I evidence that can be used by physicians making treatment decisions about disease-modifying drugs in MS. Underlying SURPASS is the assumed importance of proactive monitoring and escalating therapy early in the course of RRMS.

P2391

Utilization and safety of intramuscular interferon beta-1a in the post-marketing setting

R. Hyde, K. Curnow, P. Foulds, S. Richman, S. Friend, G. Glick, T. Onigman
Biogen Idec, Cambridge, MA, USA

Background: With the introduction of new therapies for MS, interest in cumulative safety is growing as risk-benefit considerations become more important when selecting therapy.
Objective: To report utilization and safety data for IM IFNβ-1a in the post-marketing setting.
Methods: Suspected adverse drug reactions (ADRs) with IM IFNβ-1a reported worldwide to Biogen Idec since approval in 1996 have been maintained in a safety database. To evaluate longer-term safety, all suspected ADRs from May 2006 to May 2009, including spontaneous reports, literature cases, and serious ADRs in clinical trials, were analyzed. ADRs of special interest and safety in special populations (children/adolescents, elderly, pregnant women) were also assessed.
Results: Approximately 375,450 patients with 1,239,934 cumulative years of exposure have been treated with IM IFNβ-1a. A review of ADRs overall and from the recent 3-year reporting period revealed that the nature of ADRs has remained constant and suggested no evidence of cumulative toxicity with longer-term treatment. The safety profile in children/adolescents and the elderly was generally consistent with that of adults. Malignancy reporting rates were consistent with background rates. The nature and character of pregnancy outcomes and birth defects did not suggest IM IFNβ-1a produced any teratogenicity. The rate of spontaneous loss was consistent with the background rate.
Conclusions: The safety profile of IM IFNβ-1a in the post-marketing setting is consistent with product labelling. The nature of ADRs has remained constant, and no evidence has emerged that long-term use of IM IFNβ-1a increases the risk of any unexpected ADRs not seen with shorter-term use.

P2392

First in human trial of an oral tablet with Δ9-THC (Namisol®)

L.E. Klumpers[1], J.M.A. van Gerven[1], T.L. Beumer[2]
[1]*Centre for Human Drug Research, Leiden,*
[2]*Echo Pharmaceuticals, Weesp, The Netherlands*

Introduction: Patients with multiple sclerosis (MS) often suffer from pain and spasms. These symptoms are difficult to treat using current therapies. Preclinical and clinical studies have indicated that Δ9-tetrahydrocannabinol (Δ9-THC) is effective against pain and spasms in MS patients (Kubajewska, Immunobiology 2009; Cannabinoids 2010). Namisol® is a novel formulation of Δ9-THC using Echo Pharmaceutical's propriety drug delivery technology (AlitraTM). AlitraTM is an emulsifying technology developed to improve the bioavailability of lipophilic humans.
Objective: To investigate the route of dosing, safety, tolerability, pharmacokinetics and pharmacodynamics of Namisol®.
Design: A randomized double-blind placebo-controlled phase I study was performed in healthy male and female volunteers in two panels. In panel 1 oral and sublingual administration of 5mg of Namisol® was compared using a two-way double-dummy design (n=12). In panel 2 Namisol® was escalated (6.5 and 8mg) in a three-way placebo-controlled design (n=9).
Results: After both oral and sublingual administration of Namisol® a Tmax of Δ9-THC was found at 30 - 45 minutes. Absorption of Δ9-THC was dose related. After a dose of 8mg of Δ9-THC the average increase in log VAS feeling high was 0.256 mm (95% CI 0.093, 0.418). At this dose level the average increase in log body sway was 60.8mm (95% CI 29.5 - 99.8). The average increase in heart rate after a dose of 8mg was 5.6bpm (95% CI 2.7, 8.5bpm). No SUSAR's were recorded.
Conclusions: Namisol® is safe, well tolerated and has promising pharmacokinetic and pharmacodynamic characteristics.

P2393

The definition of benign multiple sclerosis: a methodical approach

S.B. Glad[1,2], J.H. Aarseth[1], H.I. Nyland[1,2], T. Riise[1,3], K.-M. Myhr[1,2]

[1]The Norwegian Multiple Sclerosis Competence Centre, Department of Neurology, Haukeland University Hospital, [2]Department of Clinical Medicine, [3]Department of Public Health and Primary Health Care, University of Bergen, Bergen, Norway

Objectives: To study the frequency of benign multiple sclerosis (MS) in patients with over 20 years of follow-up using five different definitions. The impact of non-motor symptoms and employment were investigated within each definition.

Materials and methods: In 2003, the total cohort consisted of 230 patients with onset during 1976-1986 in Hordaland County, Norway, of whom 188 patients were still alive. Disability was assessed by the Expanded Disability Status Scale (EDSS). Depression, cognitive function, fatigue, pain, and employment status were registered. Five definitions of benign MS were used with the following EDSS cut-off values: 2.0, 3.0 and 4.0. Employment status (full-time or full- and part-time) was included in two of the definitions.

Results: The frequency of benign MS increased from 12.3% to 40.8% depending on which definition of benign MS was chosen. Patients with an EDSS ≤2.0 (14.5%) significantly lower depressive symptoms (p=0.006), less fatigue (p=0.001) and lower unemployment (p=0.018) compared to the patients with higher EDSS scores.

Conclusions: An EDSS score of ≤2.0 defined a group of patients who clearly experienced least overall impact of the disease after over 20 years of follow-up. It has been shown that patients with an EDSS ≤2.0 after disease duration of at least 10 years, also have the highest probability of keeping a low disability in a longer time frame. An EDSS score ≤2.0 with at least 10 years of disease duration seems therefore to be the most appropriate criterion in identifying patients with benign MS.

P2394

Peripheral neuropathy in multiple sclerosis - clinical and electrophysiological aspects

T. Crani[1], O. Odainic[2], D. Gherman[1], O. Misic[2], V. Nemtan[1], L. Munteanu[2], E. Gavriliuc[1], V. Lisnic[1]

[1]State Medical and Pharmaceutical University, [2]Institute of Neurology and Neurosurgery, Chisinau, Moldova

Introduction: Although multiple sclerosis (MS) has classically been considered a CNS demyelinating disease, there have been occasional reports of peripheral nervous system (PNS) involvement. Peripheral neuropathy and radiculopathy have been reported in MS patients as well as subclinical pathologic and abnormalities. The objective of the study was to establish the clinical and electrophysiological peculiarities of PNS involvement in cases of MS.

Materials and methods: There were examined 50 patients with definite MS, according to McDonald criteria. Recurrent remissive evolution of MS was established in 33 patients (66% cases). In the other 17 patients (34%) primary progressive form was revealed. The EDSS/Kurtzke score varied between 2.0 and 6.5 (mean value – 4.42). The clinical manifestations and electrophysiological pattern of the peripheral neuropathy was studied in MS patients by evaluation of neuropathic symptoms and signs, and electrophysiological studies.

Results: Clinical signs of PNS impairment were established in 6 patients (12%). Electrophysiological signs of subclinical damage of the peripheral nerves were detected rather more often. Modifications justifying the polyneuropathy were established in 14 patients (28%). They consist in a statistical significant prolongation of the distal latencies, reduction of the motor and sensory nerve conduction velocities, prolongation of the latencies of the F waves in at least 3 nerves from 6 examined.

Conclusions: PNS involvement in MS may be more frequent than is generally assumed. Often only subclinical (electrophysiological) signs could be established. Nerve conduction studies estimate the degree of PNS involvement in MS patients.

P2395

Multiple sclerosis: an orbitofrontal syndrome as the initial presentation

J. Damásio[1], S. Cavaco[2,3], P. Freitas[4,5], I. Carvalho Frade[4], P. Pinto[6], A. Martins da Silva[1], M. Magalhães[1]
[1]Neurology, [2]Neuropsychology Unit, [3]Laboratory of Neurobiology of Human Behavior, [4]Psychiatry, Hospital de Santo António, Centro Hospitalar do Porto, [5]Instituto de Ciências Biomédicas de Abel Salazar, Universidade do Porto, [6]Neuroradiology, Hospital de Santo António, Centro Hospitalar do Porto, Porto, Portugal

Introduction: Neuropsychiatric symptoms have been rarely reported as the first manifestation of multiple sclerosis (MS).

Case report: A 15-year-old female, without prior history of neurological or psychiatric disorders, developed signs of depressive mood (i.e., sadness, exacerbated fear, crying, withdrawal, anhedonia, insomnia, irritability, and suicidal thoughts). One month later, she experienced generalized seizures during sleep. Despite antidepressive treatment, the clinical presentation deteriorated; showed psychotic symptoms, poor judgment, disregard for social rules, and sexual disinhibition. This outburst of emotional and behavioural disturbances was suggestive of orbitofrontal dysfunction. The neurological examination revealed mild psychomotor slowing, asymmetric palpebral fissures, vertical nystagmus, dystonic posture of the hands, left hypoesthesia, and left dysmetria. Cerebral and spinal MRI disclosed multiple T2-weighted hyperintense lesions in periventricular, subcortical, and juxtacortical areas and cervical medulla suggestive of inflammatory/demyelinating aetiology. There were also lesions in the corpus callosum, left orbitofrontal region, right insula, and bilateral amygdala. The CSF showed elevated IgG index and oligoclonal bands. Visual evoked potentials revealed bilateral prolonged latencies. With antiepileptic therapy and a course of methylprednisolone, the symptoms progressively disappeared. One year later, she presented a Brown-Séquard syndrome and the spinal MRI disclosed a new lesion, with contrast enhancement. A course of methylprednisolone was followed by complete resolution of the symptoms. This "typical" MS attack and the evidence of time and space dissemination met the McDonald criteria for MS.

Conclusions: This case reinforces the notion that neurobehavioral disturbances may be the primary manifestation of MS. The true prevalence of such clinical presentations is still largely unknown.

P2396

The impact of autonomic disturbances on quality of life in patients with multiple sclerosis

G. Mihailescu[1], O. Iaru[2], C. Mihailescu[3], S.M. Nica[1], I. Davidescu[1]
[1]Neurology Department, Colentina Hospital, UMF Carol Davila, [2]UMF Carol Davila, [3]Internal Medicine, Psychiatry Clinical Hospital "Prof. Dr. Alexandru Obregia", Bucharest, Romania

Object: Autonomic disturbances are very frequent symptoms in patients with multiple sclerosis (MS), but unfortunately not always properly investigated and treated, influencing their quality of life. Dysautonomia affects many physiological variables and a specific created questionnaire can prove very helpful in diagnosing, treating and improving quality of life (QoL) in patients with MS.

Method: We realised a prospective study on 25 patients (17 women and 8 male), aged 20 to 59 years, diagnosed with MS and referred to our Neurology Department between 2007 and 2008. We used a specially created questionnaire and the following rating scales: EDSS, MSQOL54, Fatigue Severity Scale, Epworth Sleepiness Scale, Beck Depression Inventory, a score to evaluate disabilities for bladder and intestinal disturbances and sphincterian functions, MSISQ-19. Neurological and cardiological examinations were performed.

Results: 84% of the studied patients presented autonomic disturbances. The most frequent symptoms were cardiovascular, urinary, digestive and sexual. 72% presented fatigue, 72% bladder, 68% digestive, 63% sexual symptoms, 52 % symptomatic orthostatic hypotension, 40% minor daily sleepiness, 64% moderate depression. Only 56% of them discussed these symptoms with the neurologist and only 40% received specific treatment.

Conclusions: Autonomic disturbances are frequent and disabling, especially since these patients are usually young. The quality of life is affected by psychiatric symptoms (severely 4%, highly 16%, moderately 52%) as well as by physical symptoms (highly 28%, moderately 40%). Patients must be encouraged to describe them, doctors must be aware of the importance of asking about them and prescribe the symptomatic treatment in order to improve QoL.

P2397

Auditory symptoms in multiple sclerosis

J.S. Freitas, S. Batista, M.C. Macário, F. Matias, L. Sousa
Neurology, Coimbra University Hospital, Coimbra, Portugal

Background and aims: Despite the wide spectrum of clinical manifestations in Multiple Sclerosis (MS), auditory symptoms may only scarcely take part of the clinical picture and are often neglected by the consulting physician. An initial clinical presentation characterized by auditory symptoms arises a complex diagnostic challenge.
Methods: Retrospective analysis of the clinical files of patients attending a Multiple Sclerosis outpatient clinic.
Results: We found 5 patients (1% of analyzed population) with prominent auditory symptoms. In 3 patients they were the initial complaint and in 2 of them the diagnosis of MS was initially missed. Age at onset was between 29 and 45 years. 4 patients were female. All had acute onset and 3 had bilateral auditory symptoms. 4 had neurosensorial deafness and the remaining patient had mixed deafness. Brain MRI of all the patients showed white matter lesions typical of MS. In 4 of the patients pontine lesions were identified. Cerebrospinal fluid analysis showed positive oligoclonal bands in all but one patient. Auditory evoked potentials showed different sites of injury within the central auditory pathway. In all cases the auditory symptoms were not initially attributed to MS lesions. Nonetheless all patients showed variable improvement after initiating MS therapy.
Conclusions: A demyelinating lesion anywhere in the auditory central pathways from pontine level to the acoustic radiation may cause auditory impairment. Although it is an infrequent manifestation of MS it should be kept in mind as a potentially treatable MS-related symptom.

P2398

Quality of life in Polish patients with multiple sclerosis and urinary disorders

B.Z. Zakrzewska-Pniewska, E. Matejko-Studencka, M. Nojszewska, B. Silc
Department of Neurology, The Medical University of Warsaw, Poland

Urinary symptoms in multiple sclerosis (MS) are not only common but influence also patients' quality of life (QoL). The aim of the study was to assess the impact of urinary symptoms on the QoL in Polish patients with MS and to analyze the correlations between bladder symptoms, other MS clinical parameters and QoL.
97 consecutive subjects from an MS unit completed a specific QoL questionnaire: 70 females and 27 males with clinically definite MS, aged from 22 to 73 yrs. Mean disease duration was 9.7±7.0 yrs. The MS course was R-R in 60 cases, R-P in 18, SP - in 15 and PP - in 4 subjects. The QoL impairment was evaluated using a score system (0 - 12).
According to the patients' responses urinary symptoms occurred as first MS episode in 3% of patients and in the course of the disease - in 72%. These symptoms interfered markedly with daily living in 11% of patients. Urinary dysfunction consisted on urge (74%) or frequent mictions (64%), urinary incontinence (44%) and retention (25%). 24% of patients reported that urinary symptoms increasing during MS relapses. The QoL in scores was related to EDSS without reaching the statistical significance ($p=0.058$, Fisher's Exact Test). There were correlations neither between QoL scores and age, nor between MS course and duration. In conclusion, urinary symptoms have a major impact on the QoL in patients with MS. Optimal management in these subjects might improve their QoL and decrease the risk of urinary complications.

P2399

Abstract cancelled

P2400

1H-proton magnetic resonance spectroscopy (1H-MRS) of central pontine and extrapontine myelinolysis in a uremic patient with slow correction of hyponatremia

P. Thajeb[1,2,3], T. Thajeb[4], D.-F. Dai[5], C.-H. Shih[6]
[1]Graduate Division, Biomedical Science, John A Burns School of Medicine, UHM, USA, [2]Faculty of Medicine, National Yang-Ming University School of Medicine, [3]Medical Department and Council for Medical Education, China Medical University Hospital, Taipei City, [4]Nephrology, Landseed Hospital, Ping-Jen, Taiwan R.O.C., [5]Pathology, University of Washington Medical School, Seattle, Seattle, WA, USA, [6]Medicine, Taipei Medical University, Taipei, Taiwan R.O.C.

Central pontine myelinolysis (CPM) and extrapontine myelinolysis (EPM) are rare neurological complications following rapid correction of hyponatremia. They are called "osmotic demyelinating syndrome (ODS)." CPM may also occur in normonatremic patients who abuse alcohol. The incidence of ODS was 0.25% in 9 out of 3548 consecutive autopsies. It went up to 15% in subjects with orthotopic liver transplantation. The risk factors are chronic alcoholism (39.4%), malnutrition and transplantation encephalopathy. We report the 1H-proton magnetic resonance spectroscopy of a hypertensive non-alcoholic elderly woman with recurrent strokes, end-stage renal disease under chronic haemodialysis, and hyponatremia with slow correction of the hyponatremia who developed CPM and EPM subsequently. The neurological deficits included akinetic mutism, dysphagia, limb rigidity, focal dystonia, spastic tetraparesis, fluctuated mental confusion, and myoclonus that developed a few weeks after correction of low Na. MRI showed heterogeneous signal intensity at right basal ganglion on both T1WI and T2WI suggesting an acute demyelination and infarction with petechia, and hyperintensity at the central pons and paraventricular WM on T2WI suggesting demyelination. 1H-MRS showed decreased N-acetyl aspartic acid (NAA) to creatine ratio at right basal ganglion, and increased choline to creatine ratio of the lesions both in the white matters suggesting neuroaxonal damage and cell membrane degradation. Follow-up 1H-MRS 3 months later showed gradual normalization of the NAA/Cr. The dysphagia, limb rigidity, dystonia, and tetraparesis may improve, and the lesions on neuroimages may resolve over time; however, permanent neurological sequelae such as akinetic mutism and dementia remain even after 2 years of follow-up.

P2401

Side effects of interferon beta in a group of 45 patients with relapsing-remitting multiple sclerosis

L. Radulovic[1], S. Vujisic[1], Z. Milovic[2], M. Vukovic[3]
[1]Department of Neurology, Clinical Center Montenegro, [2]Department of Neurology, Clinical Centre of Montenegro, University of Montenegro, Medical Faculty, [3]University of Montenegro, Medical Faculty, Podgorica, Montenegro

Aim: To estimate the side effects frequency at the beginning and during the therapy with interferon beta
Method: In a group of 45 patients with relapsing-remittent multiple sclerosis we intuited the side effects of interferon beta. We monitored flu- like syndrome, laboratory findings (blood count, hepatoenzymes, creatine, urea, thyroid hormone), local reaction and developing of depression.
Results: Group consisted of 45 patients (1/3 male and 2/3 female). 42.2% were for less than a year on a therapy, 20% for 1-3 years, 37.8% for more than 5 years. Side effects were present at 31.3% of our patients. The most common were elevation of transaminases in 9 patients (reason for drug interruption in 4 patients). Only one patient showed depressive syndrome (but with attempted suicide) and 3 patients had leukopenia with intermittent need for filgrastim treatment. One patient had hyperthyroidism and neither one of the patients had serious reactions at the site of injections.
Conclusion: Side effects of therapy with interferon beta are not rare and they appeared in almost 1/3 of patients in our research. The interferon beta therapy had to be suspended in about 36% of patients with adverse effects. Although compared to 7 years ago when we started therapy with interferon beta in patients with MS and introduced the treatment faster than now, it is notable that the adverse signs of hepatotoxity are slightly more often in the initial titration of interferon therapy, but with this small number this assumption cannot be confirmed statistically.

P2402

Demyelinisation process rate in adolescents

A. Filipovich
Institute of Medical Assessment and Rehabilitation, Minsk, Belarus

Methods: 127 multiple sclerosis patients 15 to 19 years old were examined. CT and MRI of cerebrum and spinal cord, conventional clinical methods, immunoassays and a patented radioimmunobiological assay for measuring the myelinotoxic activity (MTA) of blood serum and spinal fluid were used.
Results: The MRI findings (decreasing T-1W signal and increasing T-2W signal) were diagnostically important in 91.4% of cases and the CT findings were important in 42.6% cases. Four groups of patients were distinguished:
(1) latent phase (16.6%),
(2) slow progredient phase (33.1%),
(3) acute phase (35.4%) and
(4) fast progredient phase (14.9%).
Characteristic of group 1 were slight increase in MTA of blood serum (average of 7.6 units compared to 3.9 in control group), decreased CD4+ (33.9% compared to 40.1% in control) and increased CIC levels (94.65 optical units compared to 69.32 in control). In group 2 with MTA level as high as 22.1, clear decrease of T-lymphocyte, CD22+, CD4+ and CIC levels was noted, along increase in CD8+ level and weak induction of TNF-α. In group 3 MTA level was 40.2 units coupled with increased CD8+, IL-2P+, Ig G, A, M, TNF-α, IL-8 and CIC and decreased T-lymphocyte and CD22+ levels. In group 4 MTA level was as high as 79.3; high level of CD4+, CD8+, IL-2P+, IgG, IgM, IgA and CIC and low level of T-lymphocytes and CD22+ were noted.
Conclusions: Measurement of blood serum MTA in combination with immunoassay and MRI findings helps to correctly estimate the rate of demyelinization in multiple sclerosis patients.

P2403

Activity criteria of demyelinization process

A. Filipovich
Institute of Medical Assessment and Rehabilitation, Minsk, Belarus

Methods: 396 multiple sclerosis patients from 15 to 33 years old were examined and assessed by a set of factors: clinical methods, immunoassays, myelinotoxic activity (MTA), CT and MRI of cerebrum and spinal cord, myelinotoxic activity (MTA).
Results: A latent phase (the first group, 79 patients, 19.9%) is characterized by slight increase in MTA of blood serum (7.6±1.2 units; control group - 3.9±0.82 units; $p<0.001$), decrease of CD4+ in blood (34.8±1.64%, control group - 40.1±2.4%; $p<0.001$) and by large increase in CIC levels (92.56±3.1 optical units compared to 69.32±4.28 in control group; $p<0.001$). A slow pogradient phase of MS (second group, 156 patients, 39.4%) is distinguished by moderate evident (apparent) increase in MTA of blood serum (22.3; $p<0.01$ in comparison with 1st group), significant decrease of T-lymphocyte in blood serum by 32.4%, CD22+ by 71.1%, CD4+ by 33.9%, CIC levels by 12.4%, along increase in CD8+ by 1.3 times, weak induction of TNF-α at 84.3%; IL-8 at 4.8% patients. An acute phase (third group, 144 patients, 36.3%) coupled with significant increase in MTA of blood serum (40.4±1.22 units) in comparison with 1st and 2nd groups. Acute condition of MS distinguished by significant increase in blood CD8+, IL-2P+, Ig G,A,M, CIC level along decrease of T-lymphocyte (51.7%±1.56%) and CD22+ levels. Increase in IL-2P+ at 64.1% patients coupled with significant increased TNF-α and IL-8. In the fourth group (17 patients, 4.4%) fast progress of MS distinguished by high MTA level of blood serum (78.2±4.4 units), persistent immunological changes: increase in CD4+, CD8+, IL-2P+.

P2404

Natalizumab administration in a Greek MS centre. Initial results from a stringently selected and followed-up patient cohort

M.E. Evangelopoulos, E. Andreadou, G. Koutsis, V. Pappas, C. Kilidireas, C. Sfagos, P. Davaki
Demyelinating Diseases Unit, Department of Neurology, Eginition Hospital, Athens National University, Athens, Greece

Natalizumab is a monoclonal antibody against a4-b1integrin that inhibits T-cell migration through the blood brain barrier. Although effective in the treatment of relapsing-remitting multiple sclerosis, potential life-threatening side effects require stringent selection criteria and frequent follow-ups.
Methods: From a total of 1200 patients with MS followed-up at the MS Unit, 22 patients (9 males, 13 females) were treated with natalizumab. All patients had at least one severe relapse and Gd enhancement while on immunomodulatory or immunosuppressive treatment, before initiation of natalizumab therapy. All underwent brain MRI, prior to inclusion and every six months during treatment. CD4:CD8 were analysed as indices of immunocompetence before the 1st infusion and every six months.
Results: Of the 22 patients treated with natalizumab, 10 (45%) had received more than 24 doses, 5 (23%) more than 15 and 3 (14%) more than 6 doses. To avoid infusion-related hypersensitivity reactions (HSRs), all patients received pre-treatment with cortisone and dimetindene maleate. 3 patients developed urinary tract infection, treated with per os antibiotics. Omeprazole was administered to 1 patient who developed severe nausea. No relapses or Gd enhancing lesions on MRI were observed in patients with at least one-year follow-up. 12 out of 15 patients (55%), having received more than 12 doses, showed significant clinical improvement (up to 2 points on EDSS score).
Conclusion: In our patient cohort natalizumab treatment resulted in clinical and radiological improvement without any significant adverse effects. Given its potential serious adverse reactions (infections, PML) careful monitoring and strict selection criteria were applied.

P2405

The effect of Betaferon and Avonex therapy on the serum concentration of inflammatory factors in patients with multiple sclerosis

A. Stepien[1], N.L. Dąbrowska[1], M. Chalimoniuk[2], M.M. Terela[1]
[1]*Department of Neurology, Military Institute of Medicine,* [2]*Department of Cellular Signalling, Polish Academy of Sciences, Warszawa, Poland*

Beta interferon isoforms (INFβ-1a, INFβ-1b) are one of the most efficient medicines nowadays used in multiple sclerosis (MS) treatment. The aim of this study was to investigate the effect of the 18-month Betaferon and Avonex therapy on the concentration of cytokines (TNF-α, INF-γ, IL-6, IL-2, IL4, IL-10) and nitrogen oxide (NO) in the serum of patients with MS. The patients with the similar phase, time of MS and age were treated 18 month with Betaferon (n=5) or Avonex (n=11). NO level was assessed by measurement of cGMP and nitrites (NO2-)concentration using the spectrophotometrical methods before and after 6 and 18-month therapies. The concentrations of IL-6, IL-2, IL4, IL-10, TNF-α, INF-γ were detectable in serum from all groups. The concentration of cytokines in the serum did not statistically change during and after the 18 months of Betaferon therapy as compared to cytokines levels before this therapy. Betaferon decreased NO2- and cGMP concentration in the serum of MS patients after 6 and 18 months of therapy as compared to its level before therapy. The concentration of INF-γ, IL 2, IL 4, and IL 6 did not change in the serum of the MS patients with treated with Avonex. Moreover Avonex decreased TNF-α and IL-10 concentration in the serum after 18 months of the therapy. The concentration of TNF-α and IL-10 after 18 months of Avonex treatment considerably lowered statistically when compared to MS patients treated with Betaferon.

P2406

No relationship between tau protein antigen and anti-tau antibodies in multiple sclerosis

A. Bartos[1], L. Fialova[2], J. Svarcova[2], D. Dolezil[1], I. Malbohan[2]
[1]*Department of Neurology, Charles University, Third Faculty of Medicine, University Hospital Kralovske Vinohrady,* [2]*Institute of Medical Biochemistry, Charles University, First Faculty of Medicine, Prague, Czech Republic*

Introduction: Neuro-cytoskeletal protein tau and antibodies against tau in cerebrospinal fluid (CSF) may indicate neuronal damage in multiple sclerosis (MS). However, findings for CSF tau concentrations are inconsistent. The interaction between the immune system and the neuron-specific structure results in antibody synthesis. It may be dependent on the tau antigen load.
Aims: To explore the difference between MS patients and controls in CSF tau concentrations, intrathecal anti-tau antibodies and the relationship between tau antigen and corresponding anti-tau antibodies.
Patients and methods: We measured CSF tau protein concentration, CSF and serum IgG, albumin and anti-tau antibodies using mainly ELISAs in 16 MS patients and 20 age-matched controls. All molecules were measured in 26 individuals (9 MS patients, median 39 years, min 20 – max 57 years and 17 age-matched controls; 35, 16-52). We calculated three ratios between tau concentration and serum anti-tau, CSF anti-tau or intrathecal anti-tau synthesis, respectively.
Results: We observed no difference in any of the measures except for total IgG index and intrathecal anti-tau synthesis between MS patients and controls. We did not find any relationship between tau antigens and antibodies and demographics neither in MS group nor in controls.
Conclusions: The CSF concentration of tau protein does not differ between MS patients and controls and is independent of anti-tau antibody CSF level.
Supported by MSM 00216208, KAN200520701 and NS 10369-3.

P2407

Injection application methods in patients with multiple sclerosis treated with subcutaneous immune modulator and injection area reactions

T. Basak[1], S. Demirkaya[2], S. Uzun[1], G. Genc[2]
[1]*School of Nursing,* [2]*Neurology, Gulhane Military Medical Academy, Ankara, Turkey*

Introduction: Immune modulator treatment, constitutes the first line treatment of relapsing remitting multiple sclerosis. Injection area reactions are one of the most common side effects of this treatment.
Aim: This work intended to compare the reactions of subcutaneous treatment applying and injection application methods in multiple sclerosis patients who got injection training before application with reaction of the injection area after injection.
Methods: Descriptive and cross-sectional study. 50 patients, who volunteered to participate in the study, were studied. The data of the study collected by a form developed by the researchers based on literature and expert opinion. The data were evaluated by computer, for descriptive statistics frequencies and percentages, for assessing the materiality statically, Kruskal Wallis, Mann Whitney U-test being used.
Results: Among 76% of patients, at least one injection site reaction has been detected. Differences between gender and injection area reactions development status were statistically significant. Between the status of making rotations between the injection areas, hand washing status of the applying person before injection, status of cleaning the injection site, status of non-steroidal drug use before injection, the expected duration of the drug dissolution, the syringes that used and injection area reactions development status were statistically insignificant.
Conclusion: In women more injection area reactions can be seen than in men. Pain, redness, are among the most common injection site reactions and the most serious and least developed reactions are abscesses and lipoatrophies. The characteristics of injection applications were found not effective on the injection area reactions.

P2408

Characterizing the factors affecting treatment experience of patients with relapsing-remitting multiple sclerosis using an electronic auto-injection device for subcutaneous interferon beta-1a

E. Verdun[1], V. Devonshire[2], P. Cornelisse[1], The RebiSmart™ User Trial Study Group
[1]Merck Serono S.A., Geneva, Switzerland, [2]University of British Columbia, Vancouver, BC, Canada

Background: Understanding factors influencing patients' treatment experience may improve adherence, and thereby outcomes, in multiple sclerosis (MS).
Objective: To identify factors that may influence adherence in patients using an electronic auto-injection device (RebiSmart™) for administering subcutaneous interferon (IFN) beta-1a.
Methods: This international, open-label, 12-week, Phase IIIb study evaluated the suitability of RebiSmart™ in patients with relapsing-remitting MS. Patients were receiving IFN beta-1a, 44mcg thrice weekly, via a self-injection system for ≥6 weeks. Exclusion criteria were visual/physical impairment precluding self-injection or use of any disease-modifying MS therapy (excluding IFN beta-1a) in the previous 12 months. Suitability in patient sub-populations was assessed post hoc.
Results: The device was rated 'very suitable'/ 'suitable' for self-injection at week 12 by 71.6% of patients (73/102; primary endpoint). 60 patients reported no/mild pain while 45 reported more than mild pain (item 38 of the Multiple Sclerosis Treatment Concern Questionnaire). Of 79 patients reporting local injection-site reactions, 11 (13.9%) described it as 'severe'. Patient-reported pain rating did not affect overall suitability rating; 93% of those reporting no/mild pain and 91% reporting more severe pain considered the device 'suitable'/' very suitable'/' a little suitable'. Age, baseline Expanded Disability Status Scale score, disease and treatment duration, injection-site reactions and body mass index had no effect on perceived suitability.
Conclusion(s): Patients' treatment experience may positively influence their adherence. In this sub-analysis, patient-reported pain had little effect on perceived suitability of the electronic auto-injection device for IFN beta-1a.
Sponsor: Merck Serono S.A. – Geneva, Switzerland, an affiliate of Merck KGaA, Darmstadt, Germany.

P2409

The study of association between Interleukin-7 receptor alpha chain gene and multiple sclerosis in Iranian patients

M. Ahmadzadeh Raji[1,2], S.M. Nabavi[3], A. Khosravi[4], R. Hajihoseini[2], A. Ebrahimi[5], M.H. Sanati[5]
[1]Central Research Lab, University of Tehran, [2]Biochemistry, Payame Noor University, [3]Nourology, Shahed University, [4]Mycology, University of Tehran, [5]National Institute of Genetic Engineering and Biotechnology, Tehran, Iran

Multiple sclerosis is a chronic and demyelinating disorder with neurodegenerative aspects. The inflammatory response in this disease consists of autoimmune features and it depends on genetic factors. Among genetic factors, IL-7 receptor α chain has been repeatedly demonstrated to associated with multiple sclerosis. (Sawcer et al 2007). The aim of this study was to identify the relationship between IL-7R α chain gene and MS in an Iranian population with MS (60 patients and 60 controls). After DNA extraction from whole blood, we used two techniques, SSCP and sequencing. We observed one SNP in promoter, most of the alleles of the patients were homozygous. In Exon 2 we found five SNPs; one of them with rs1494558 can change amino acid isoleusin to treonin (P.66 I>T). The study of exon 4 of IL-7R α in the patients revealed 2 SNPs and two sequence variations as P. V138I results in valine substitution with isoleusin and a silent nucleotide substitution as P. H 165H which has no amino acid alteration. The genotypes of SNPs of controls and patients analysed by x2 showed no significant association with multiple sclerosis in this group of patients. Further studies will be required to reveal the effects of these SNPs on the IL7R α protein and its role in multiple sclerosis.

P2410

Multiphasic disseminated encephalomyelitis after herpes simplex virus type-1 infection of the central nervous system

T.-K. Lee, Y.H. Yun, J.-H. Park, S.-A. Park, K.-B. Sung
Neurology, Soonchunhyang University, Bucheon, Republic of Korea

Case report: We describe a 26-year-old woman who showed recurrent neurologic attacks after successful treatment of herpes simplex virus type-1 (HSV-1) encephalomyelitis. Initial presentation was acute febrile consciousness disturbance with headache and bladder dysfunction which was proved to be due to HSV-1 infection by serial CSF PCRs and cerebro-spinal MRIs. After clinical and radiological improvement with high-dose steroids and intravenous acyclovir, sudden onset of bilateral optic neuritis and newly developed disseminated encephalomyelitis (DEM) followed consecutively 4 weeks and 10 weeks after initial onset. Each of these two postinfectious neurologic attacks also responded successfully to high-dose steroids. For more than 3 years follow-up, there has been neither a clinical relapse nor a newly developed asymptomatic lesion on follow-up MRI scans. Although acute disseminated encephalomyelitis (ADEM) is usually monophasic and its recurrence can be confused with relapsing-remitting multiple sclerosis, several lines of evidence exist that multiphasic recurrence of disseminated encephalomyelitis can occur in the name of multiphasic disseminated encephalomyelitis (MDEM). Recurrent neurologic attacks of this case can be considered to be an MDEM by definite temporal relationship of clustering attacks and non-progressive course. We report a case of MDEM after successful treatment of acute HSV-1 meningoencephalomyelitis which has never been reported before.

P2411

Corticosteroids-induced osteoporosis in young patients with multiple sclerosis

O. Zaharia-Pushkash[1], C. Voiticovschi-Iosob[2], O. Odainic[2], M. Gavriliuc[3]
[1]Neurorehabilitation, [2]Stroke, [3]Neurology, Institute of Neurology and Neurosurgery, Chisinau, Moldova

Background: Corticosteroids (CS)-induced osteoporosis is the leading form of secondary osteoporosis. Treatment with CS has no alternative in relapses of multiple sclerosis (MS) due to their immunosuppressive effect. However, osteoporosis and the related fractures are a serious complication brought by short-term or high-dose CS therapy. Patients with relapsing remitting form (RRMS) are treated with high-dose, short-term i/v CSs.
Objectives: Prevention and recognition of first-signs of osteoporosis in MS patients treated with high-dose CSs in order to lessen the impact of osteoporosis.
Methods: 12 patients with RRMS [9 females, 3 males; of 28±3.5 years and receiving i/v methylprednisolone 15mg/kg daily for 7 days completed our study. All patients had only 1 relapse (second or third) during the 12-months study. We performed laboratory exam of bone formation and resorption markers on the first, third, seventh days and six, twelve months after therapy, as well as, dual-energy x-ray absorptiometry (DXA) before therapy and 6, 12 months after CS-therapy.
Results: As the results of examinations came out that in the first days of CS-therapy there was a decrease of bone resorption markers and increase of bone formation markers. We noted the DXA changes: decrease of Z-score more then -1.5 for >6 months.
Conclusions: Patients with RRMS treated with high-dose methylprednisolone experience pain, walk disability, diminished quality of life and could not perform physical rehabilitation after relapse because of osteoporosis. Prophylaxis with Calcitonin, calcium vitamin D3 during 3 months could diminish the osteoporosis manifestations in young MS patients receiving CSs.

P2412

Interferon regulatory factor 8 (IRF8) in multiple sclerosis: influence of rs10514611 variant on miR-330-3p binding

C. Cantoni[1], C. Fenoglio[1], D. Scalabrini[1], M. Serpente[1], M. De Riz[1], L. Mellesi[2], S. Valzelli[2], E. Venturelli[1], C. Villa[1], F. Cortini[1], N. Bresolin[1], E. Scarpini[1], D. Galimberti[1]
[1]Dept. of Neurological Sciences, 'Dino Ferrari' Center, University of Milan, IRCCS Ospedale Maggiore Policlinico, [2]Medical Department - Bayer Schering Pharma, Milan, Italy

Background: Interferon regulatory factor 8 (IRF8) is a member of the IRF family of transcription factors whose members play critical roles in interferon (IFN) signalling pathways governing the establishment of innate immune responses by myeloid and dendritic cells.
Objective: To test IRF8 rs10514611 as susceptibility factor for Multiple Sclerosis (MS) and to determine the influence of rs10514611, located in the binding site of miR-330-3p, on miR-330-3p expression in MS patients.
Methods: 236 Italian patients with MS and 62 age-matched controls were tested for association with rs10514611 through allelic discrimination technique. Expression profile of miR-330-3p was tested in 8 patients with Relapsing-Remitting (RR)-MS carrying different genotypes for rs10514611. RNA was extracted from PBMC and mRNA was specifically retrotranscribed for each miRNA. RNU48 was used as endogenous control. All the experiments were performed using an ABI PRISMÒ7500 FAST instrument (ABI). Sigma Stat software was used for statistical analysis.
Results: Considering rs10514611, no differences in either allelic or genotypic frequencies between patients and controls were found (P>0.05). On the contrary, significant differences in the expression profile of miR330-3p were found in RRMS patients carrying at least one polymorphic allele versus non carriers (1.46±0.03, n=5, versus 0.67±0.12, n=3, P=0.014).
Conclusions: Previous evidence suggests that genetic variability in IRF8 influences its expression in MS although the mechanism still remains unclear. Our preliminary results suggest a role of rs10514611 in IRF8 expression through the modulation of miR-330-3p expression. Studies in a larger population are required to confirm these preliminary results.

P2413

Influence of GSK-3β genetic variability in patients with multiple sclerosis

D. Scalabrini[1], J. MacMurray[2], C. Fenoglio[1], M. De Riz[1], C. Comi[3], D. Comings[2], E. Venturelli[1], F. Cortini[1], C. Villa[1], M. Serpente[1], C. Cantoni[1], M. Leone[3], F. Monaco[3], N. Bresolin[1], E. Scarpini[1], D. Galimberti[1]
[1]University of Milan, Milan, Italy, [2]Carlsbad Science Foundation, Carlsbad, CA, USA, [3]University of Novara, Novara, Italy

Background: Glycogen synthase kinase-3 beta (GSK-3β) is a ubiquitous kinase that is part of multiple signalling pathways, including Wnt and insulin signalling pathways. It has neurotrophic/neuroprotective effects by contributing to mediate the actions of neurotrophic molecules in the brain, thus modulating energy metabolism providing neuro-protection. Notably, it has been demonstrated that GSK-3β is involved in Wnt-beta-catenin signalling, which contributes to inhibit myelination/remyelination processes in mammals.
Objective: To test GSK-3β for association with multiple sclerosis (MS).
Methods: 315 patients with MS and 277 age-matched controls were tested for association of GSK-3β with risk for MS. Four common variants (rs2199503, rs9826659, rs334558 and rs6438552) tagging about 100% of the GSK-3β SNPs in the HapMap database with an r2>0.80, were genotyped by allelic discrimination using an ABI PRISM ®7000 instrument.
Results: No significant differences were found between patients and controls for the SNPs studied. Stratifying MS patients according to the disease sub-type (226 MS-RR, 25 MS-PP, 64 MS-SP), a statistically significant difference of rs334558 GG frequency was found between MS-RR patients and controls (f(G/G)=27.4% in MS vs. f(G/G)=17.6% in Controls; f(G)=28% in MS vs. f(G)=39.2% in controls, p=0.009).
Conclusion: Our results could support a role for GSK-3β in the genetic etiology of MS. It is also important to notice that rs334558 is a promoter region SNP; this could suggest a specific role of this SNP in the inflammation process of the disease. Further studies are needed to confirm these preliminary data.

P2414

Effects of childbearing issues on prognosis in patients with multiple sclerosis

S. Ozakbas[1], Y. Guven Yorgun[1], B. Sengul[2], O. Kumus[2], C. Beser[2], J. Kizilkan[2], M. Aksoy[2], E. Idiman[1]
[1]Neurology, [2]Dokuz Eylul University, Izmir, Turkey

Background: Multiple sclerosis (MS) is an autoimmune demyelinating disease mostly affecting women with childbearing potential. It has been suggested that MS relapse decreases in the pregnancy period, and increases in the postpartum 3 months. There has been no study regarding long-term effects of childbearing on MS prognosis. In the present study, we aimed to determine the effects of parameters regarding childbearing, such as pregnancy, lactation and abortion on the prognosis of MS, in a cross-sectional design.
Patients and methods: 96 female patients were screened. 67 out of them, with at least 10 years disease duration were included in the study. Mean age was 43.2, mean disease duration was 12.2. Demographic features including number of pregnancies and abortion, and duration of lactation were recorded. Features regarding MS, such as disease duration, attack rate, expanded disability status scale (EDSS) score in the time of inclusion were also determined.
Results: Total number of pregnancies in whole life time was not correlated with EDSS score. However, number of pregnancies after MS had started was significantly correlated with EDSS (r= 0.38, p=0.025). When the age parameter added to analysis correlation continued (r=0.35, p=0.039). EDSS was significantly higher in patients who had at least one pregnancy than patients never been pregnant (p=0.02). They were also more depressed (p=0.01).
Conclusions: We concluded that, in MS patients, pregnancy might increase the probability of disability when symptoms started, and patients should be informed regarding probability of higher disability when they planned to be pregnant after they were diagnosed.

P2415

Acute disseminated encephalomyelitis after H1N1 infection

D. Ekmekci, M. Gencer, K. Tutkavul, F. Varlibas, H. Tireli
Haydarpasa Numune Education and Research Hospital, Neurology Department, Istanbul, Turkey

Background: Acute disseminated encephalomyelitis (ADEM) is an immune-mediated inflammatory disorder of the central nervous system characterized by a widespread demyelization that predominately involves the white matter of the brain and spinal cord. The condition is usually precipitated by a viral infection or vaccination.
Case: We report a case of a 20-year-old previously healthy male patient presented with high fever, headache, dysarthria and epileptic seizure. Neurological examination revealed confusional state, hyperactive deep tendon reflexes, cerebellar dysarthria and gait ataxia. The initial magnetic resonance imaging (MRI) study showed bilaterally increased signal intensity in periventricular and deep white matter, and the corpus callosum on T2 weighted images. The same lesions were hyperintense on diffusion sequence and hypointense on ADC mapping. Polymerase chain reaction (PCR) assay of nasal swab sampling detected Influenza A (H1N1) virus. His neurological deficit recovered within 2 days following oral oseltamivir and methylprednisolone pulse therapy for five days. MRI findings were also improved at the tenth day of hospitalization.
Conclusion: We concluded that the clinical condition was due to the influenza A (H1N1) virus associated encephalopathy.

P2416

Ten MS patients with withdrawal of Natalizumab: what happens afterwards? Experience in the neurological colleges of the general hospital at Ile de France area (CNIF)

S. Oporto[1], O. Heinzlef[2], T. Debroucker[3], O. Ille[4], F. Pico[5], C. Nifle[5]
[1]Hopital Mignot, [2]CHI de Poissy, [3]CH Saint Denis, [4]CH Mantes la Jolie, [5]CH Mignot, Ile de France, France

Introduction: Previous observation of withdrawal of natalizumab described worsening of clinical and radiological neurological status, whether this worsening corresponds to a rebond effect or to the prenatalizumab activity of disease remains to be determined.
Objective: To evaluate the frequency and characteristics of potential rebound effect in patients with MS who stopped natalizumab.
Materials and methods: We contacted all neurological departments of general hospitals of our area belonging to the Ile de France. We, retrospectively, analysed available cases of natalizumab withdrawal. Clinical MRI aspect before, during and after natalizumab treatment.
Results: Among 70 patients treated with natalizumab from May 2007 to February 2010, we identified 13 cases of withdrawal.10 fulfilled our inclusion criteria, mean age 33 years old, mean EDSS =4 when starting natalizumab, all of them with a good clinical evolution under natalizumab, with decreased EDSS and annual relapse index. 3 of them, after stopping natalizumab, developed 1 relapse which looks like a rebound effect. They had received respectively 12, 9, 10 natalizumab perfusion. They stopped treatment because of wanted pregnancy or suicidal risk, their maximal augmentation of EDSS after withdrawal treatment was 2, 2.5, 3 points. IRM of 2 of them has shown an increased T2 lesion load, and many gadolinium enhanced lesions.
Conclusions: In this series, we identified 3 clinical and radiological worsening evolutions above 13 who stopped natalizumab suggesting a probable rebound effect.

P2417

Predicting factors that influence health related quality of life of patients with multiple sclerosis in the Republic of Serbia

D. Tadic[1], V. Djajic[1], L. Popovic[1], M. Arbutina[1], N. Petrovic[2], T. Pekmezovic[3], J. Drulovic[4]
[1]Clinic for Neurology, Clinical Center Banjaluka, Bosnia-Herzegovina, [2]Clinic for Neurology, Clinical Center Celje, Slovenia, [3]Institute for Epidemiology University School of Medicine Belgrade, [4]Institute for Neurology University School of Medicine Belgrade, Serbia

Background and aims: There is an increasing recognition that the global wellbeing of patients with chronic neurological disease is an important outcome both in research and clinical practice.
The goal of this study was to identify clinical and demographic factors which are influencing health related quality of life (HRQoL) in patients with multiple sclerosis.
Material and methods: In our study, we examined 50 patients, with selected demographic (age, employment status, level of education, sex, marital status, profession) and clinical (neurological impairment, depression, anxiety, duration of disease, age of onset, form of disease) parameters. In this study neurological impairment was assessed with the Expanded Disability Status Scale, and presence of depression and anxiety with Hamilton Depression Rating Scale and Hamilton Anxiety Rating Scale. Scores of HRQoL were measured by MSQoL-54 disease specific instrument. Statistical analysis included descriptive statistics, correlation and regression analysis.
Results: The most important predicting factors which are influencing physical composite score of MSQoL-54 scale in our study were depression (p=0.001), employment status (p=0.002) and age (p=0.001); and predicting factors which influence mental composite score of same instrument were depression (p=0.001) and profession (p=0.006).
Conclusion: Many studies related to individuals with multiple sclerosis, including our, have demonstrated that the overall wellbeing is not a simple manifestation of impairment or disability, than a combination of many demographic and clinical parameters.

P2418

Evaluation of depression in patients with multiple sclerosis

E. Betscher, R. Bonek
Neurology, Military Clinical Hospital, Bydgoszcz, Poland

Background and purpose: Multiple sclerosis (MS) is the most common chronic inflammatory disease of the CNS, which concentrated the attention of researchers of different specialities, mainly owing to complexity of reason and clinical course. Depression is a common symptom in MS patients and more than 40% of MS patients suffer from these symptoms. The aim of this study was to estimate the level of depression in relation to the clinical course and correlation with the demographic and clinical factors.
Material and methods: 90 patients (59 females and 31 males) with definite MS according to Mc Donald et al. criteria were investigated. The MS group consisted of 30 patients with RRMS, 30 patients with primary progressive PPMS and 30 patients with SPMS. All the patients were evaluated using Montgomery-Äsberg Depression Scale (MADRS). Their span of disability was rated including the Expanded Disability Status Scale (EDSS).
Results: Depression was found in 23% of patients in RRMS group, 57% in PPMS group and 47% in SPMS. We did not find any statistically differences between a level of depression and chosen demographic and clinical factors.
Conclusion: Patients with PPMS and SPMS are endangering depression in highest degree. The level of depression does not correlate with sex, age, disease duration and degree of disability.

P2419

Alterations in phospholipid fractions in MS patients

N. Filipovich[1], A. Filippovich[2]
[1]Advanced Doctors Training Institute, [2]Research Institute of Medical Assessment and Rehabilitation, Minsk, Belarus

P2420

A case of demyelinating disease presenting symptoms like in Guillain-Barré syndrome

T. Kasikci, S. Bek, E. Tokgoz, S. Demirkaya, Z. Odabasi
Gulhane Medical Academy, Ankara, Turkey

P2421

Multiple sclerosis and Parkinson's disease co-existence: two case reports

G. Cheilakos[1], K. Drakatos[1], M. Terzoudi[2], I. Giannakopoulou[1], M. Maltezou[1]
[1]Neurology, 1st Social Security Institution (IKA) Hospital, [2]Neurology, Iaso General Hospital, Athens, Greece

P2422

Assessing fatigue in multiple sclerosis: Georgian modified fatigue impact scale

D. Gigineishvili[1,2], M. Kiziria[2,3], R. Shakarishvili[1,2]
[1]Department of Neurology & Neurosurgery, Javakhishvili State University, [2]Sarajishvili Institute of Neurology and Neurosurgery, [3]Javakhishvili State University, Tbilisi, Georgia

P2423

Successful treatment with antibiotics for an intractable neuromyelitis optica

Y. Feng
Department of Neurology, The First Affiliated Hospital of SUN Yat-sen University, Guangzhou, China

P2424

Soluferon®, a second generation interferon with improved bioavailability

C. Oertelt, L. Grode, B. Eisele
Vakzine Projekt Management GmbH, Hannover, Germany

P2425

How to test the attention in MS patients

K. Obereigneru[1], R. Obereigneru[1,2], V. Sladkova[1], J. Mares[1], P. Kanovsky[1]
[1]Neurology, University Hospital and Medical School of Palacky University, [2]Dpt. of Psychology, Philosofical Faculty, Palacky University, Olomouc, Czech Republic

P2426

Hypocretin/orexin system function may be altered in later stages of multiple sclerosis

E. Papuc[1], K. Rejdak[1,2], P. Grieb[2], Z. Stelmasiak[1]
[1]Department of Neurology, Medical University of Lublin, Lublin, [2]Medical Research Center, Polish Academy of Sciences, Warsaw, Poland

P2427

The onset of multiple sclerosis: demographic characteristic, initial symptoms and clinical course. A study of 375 Polish patients

R. Bonek
Neurology, Military Clinical Hospital, Bydgoszcz, Poland

P2428

Extracorporal photochemotherapy in treatment of multiple sclerosis

S.V. Kotov[1], A.V. Kildyushevsky[2], O.P. Sidorova[1], A.Y. Merculov[1]
[1]Department of Neurology, [2]Department of Chirurgical Detoxication, M.F.Vladimirsky Moscow Regional Clinical and Research Institute, Moscow, Russia

P2429

Longitudinally extensive transverse myelitis: a case presentation

C. Feier[1], R. Balasa[1], S. Maier[2], Z. Bajko[1], A. Motataianu[1]
[1]University of Medicine and Pharmacy, [2]Neurological Department, Emergency County Hospital Mures, Targu Mures, Romania

Child and developmental neurology

P2430

Cognitive function domains in children with ADHD

C. Thursina
Neurology, Gadjah Mada, Sleman, Indonesia

Background: ADHD is one of the most common disorders found in children. The reductions in mental ability or cognitive impairment are often happening in children; however, they often escape from the parents' or the teachers' attention. At present, there is still some debate over which cognitive domains are affected by ADHD.
Objective: To assess the cognitive function as a whole in children with ADHD, as well as in each cognitive domain.
Subject and method: A cross-sectional study was carried out in the district of Banguntapan. Children in the age of 6-11 years, who fulfilled the inclusion criteria, were enrolled in this study. All subjects went through DSM-IV screening, ACTRS and ACPRS, Mini Mental State Examination Child (3MSEC) and WISC-III,
Results: From 2021 children registered in 6 elementary schools in Banguntapan, 55 were reported as probable cases of ADHD (28.7%). 35 were then included in the analysis. In 3MSEC, children with ADHD appeared to have difficulties in attention, recall and identity ($p=0.001$, $p=0.04$ and $p=0.001$, respectively). Moreover, children with ADHD had a significantly lower IQ compared with normal children ($p=0.017$), especially in performance IQ ($p=0.044$). In analysis of each IQ subcomponents, children with ADHD had a lower score in calculation and in information ($p=0.019$ and $p=0.016$, respectively).
Conclusion: Children with ADHD showed lower cognitive function, especially in attention, recall and language. Children with ADHD also had lower IQ score, especially in performance IQ.

P2431

Childhood encephalopathies with intracerebral calcinosis

H. BenRhouma, A. Rouissi, I. Kraoua, I. Rebai, N. Fredj, I. Turki, N. Gouider-Khouja
Child and Adolescent Neurology Department, National Institute of Neurology, Tunis, Tunisia

Introduction: Childhood encephalopathies with intracerebral calcinosis (EIC) are clinically and etiologically heterogeneous diseases. We report on main particularities of EIC in 12 children and we discuss clinical, imaging and aetiological features.
Methods: From 2004 to 2009, 12 children with EIC were followed up in the Child and Adolescent Neurology department of National Institute of Neurology of Tunis. Main clinical, imaging and aetiological features were analysed.
Results: 8 boys and 4 girls had EIC. Mean age was 6.1 years. 8 were born from consanguineous parents. 10 had psychomotor delay and 2 had psychomotor regression. Main clinical features were represented by spastic tetraparesis (12 cases/12), microcephaly (7 cases), movement disorders (6 cases) and optic atrophy (2 cases). All patients had intracerebral calcinosis on CT scan (10 had basal ganglia calcinosis and 2 had periventricular calcinosis). Brain MRI was performed only in 8 patients. 4 of them had signal abnormalities in basal ganglia corresponding to calcinosis seen on CT scan and the others had other abnormalities (leucodystrophy, cerebral atrophy). Main aetiologies found in our patients were inherited metabolic diseases (Aicardi Gouttière syndrome (5 cases), dysparathyroidism (2 cases), intracerebral folate deficiency (1 case) and mitochondriopathy (1 case)).
Discussion and conclusion: Intracerebral calcinosis should be searched in every child with encephalopathy. CT scan is highly sensitive in detecting calcification and is considered as a current gold standard over MRI. In our series, main aetiologies are represented by neuro-metabolic diseases. Metabolic testing must be done systematically in patients with EIC to diagnose treatable and preventable causes.

P2432

Usefulness of the head-up tilt test in distinguishing neurally mediated syncope and epilepsy in children

M.R. Sabri, T. Mahmodian, H. Sadri
Isfahan University of Medical Sciences, Isfahan, Iran

Objective: Many non-epileptic disorders may mimic epilepsy by history or clinical presentation. Neurally mediated syncope is one of the most important conditions that might be difficult to differentiate from epilepsy on clinical grounds. We investigated the value of the head-up tilt test (HUT) to diagnose syncope in epileptic children.
Methods: We studied 40 patients (18 girls and 22 boys) between 5 and 20 years old (mean, 11.5±3.5) who had a previous diagnosis of epilepsy. All patients underwent a HUT test.
Results: The HUT test was positive in 26 patients (65%). No statistical difference was observed between the tilt positive and negative groups in sex, age, provocing factors, associated symptoms, family history of syncope and heart disease, findings in physical examination, and electroencephalogram result. There was a history in favour of true syncope in 58% of tilt positive patients compared to 14% of tilt negative patients ($p<0.05$). Also, family history of seizure was more frequent in tilt positive patients ($p<0.05$). After 18±6 months of follow-up, 18 of 26 patients with a positive tilt test were completely asymptomatic.
Conclusion: Inadequate history taking and overemphasis on positive family history for seizures were important causes of misdiagnosis of epilepsy in our study. The HUT test is a simple, non-invasive diagnostic tool for distinguishing syncope and epilepsy in children and should be considered early in the diagnostic plan and for determining management of selected patients with a history of drop attack and loss of consciousness.

P2433

"Uncovertebral wedge" as a cause of child's acute stiff-neck

A. Gubin[1], E. Ulrich[2]
[1]Surgical, [2]Saint-Petersburg State Pediatric Medical Academy, Saint Petersburg, Russia

Child acute stiff-neck is a common syndrome that is usually accounted in medical literature by atlanto-axial subluxation. Etiology of this illness is not completely understood by modern science.
Materials and methods: 10 children 5-14 years old had acute pain and typical "cock-robin" head position. We tried to do a patient MR-scan as soon as possible.
Results: We found a triangle or oblong high intensity zone near the external edges of backbone disks CII-CIII or CIII-CIV. The zones were always on the side where the patients felt pain. The zones could not be detected on repeated scans after 3-21 days.
Conclusion: We propose the following explanation of this syndrome that we called "uncovertebral wedge." The area of uncovertebral join is filled with vascularised tissue. It is limited by the fibrous ring inside, by the ligaments in front and back, and by the disk bodies from top and bottom. In our opinion, the main reason of the child's acute stiff-neck is a rapid or gradual strangulation of the vascularised tissue in unconvertebral zones caused by a head movement or a neck's prolonged incurvationed position during a profound sleep. It causes a "wedge" of hydropic tissues (venous stasis) that irritate the back longitudinal ligaments. As the result, a head has an antalgic position and, in the most severe cases, is blocked. This gives an explanation why the extension is so effective because it reduces pressure in the uncovertebral zone, improves the venous blood circulation, and solves the problem.

P2434

Kluver-Bucy syndrome in children with hypoxic ischemic encephalopathy

S. Jha, M.K. Ansari
Neurology, Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, India

Background: Kluver-Bucy syndrome (KBS) includes hyperorality, placidity, indiscriminate hyper sexuality and altered dietary habits, reported to develop following insult to temporal lobes. Psychic blindness (inability to recognize familiar objects) and hyper metamorphosis (over reaction to visual stimulus) are its other constituents.
Method: We encountered 16 children in age range of 6 - 16 years between 1996 and 2008 (12 years) with features of KBS. They were selected from cases of cerebral birth anoxia consequent to hypoxic ischemic encephalopathy (HIE). Only children having documented evidence of HIE (standard criteria) were selected. This was based on birth records of paediatrician, history by mother and clinico-radiological features. Presence of hyperorality, sexual hyperactivity and abnormal behaviour suggested the presence of KBS.
Results: Hyperorality and abnormal behaviour were common manifestations in all 16 (100%) patients. Hypersexuality was evident in 7 (43%) children. Psychic blindness and hypermetamorphosis were present in 4 (25%). Violent behaviour was present in 6, while 4 patients had a placid behaviour. Bulimia and coprophagia were observed in 3 patients. Seizures were present in 9 (56%), among whom, they were well controlled (more than 60% decline in frequency) in 5 children by sodium valproate or carbamazepine. Following seizure control, significant improvement in behaviour was observed in 4 cases. In the other patients, behaviour was unaltered.
Conclusion: It appears that KBS may be more common in children of HIE than suspected previously and may manifest with a wide clinical spectrum. Seizures are commonly associated and their control may help in improving behaviour.

P2435

Multiple sclerosis in childhood - clinical characteristics, prognosis and treatment

V.S. Bojinova-Tchamova, P. Dimova, E. Slavkova, V.T. Tomov, T. Yankov
Clinic of Child Neurology, University Hospital of Neurology and Psychiatry 'Sv. Naum', Sofia Medical University, Sofia, Bulgaria

Aim: To analyze clinical forms, diagnostics and prognosis in children with MS.
Clinical contingent and methods: 47 children aged 3 to 17 years with definite MS (11 with childhood and 36 with juvenile MS), followed up for 1 to 10 years.
Results: 41 out of 47 children (87.2%) had relapsing course; 2 (4.2%) - primary progressive course and 4 (8.5%) - one attack but progressive increasing MRI lesions. Relapses in the first year had 40.4% (n=19) - 47.2% (17/36) with juvenile and 18% (2/11) with childhood MS. Relapses during the first two years had 70% (n=33) - 77.8% (28/36) with juvenile and 45.4% (5/11) with childhood MS. The follow-up study found normalization in 46.8%. Neurological deficit had 53.2% of juvenile MS patients (n=22), in 7 after the first attack, in 13 with frequent relapses during first 2 years and in 2 with primary progressive course. Multiple hyperintense T2 lesions on MRI had all patients, in 18% (n=10) of large size. MRI follow-up disclosed reduction in the size of lesions in 7 and new lesions in the other 22 cases, 4 of them without history of a new attack or progression. All children were treated during the attacks with metylprednisolone; 10 children received INF-B and 3 – IV IG.
Conclusions: Juvenile MS had unfavourable prognosis due to frequent relapses during the first two years. Neurologic deficit and MRI data for active demyelination motivate the use of disease modifying therapy for juvenile MS.

P2436

Protocol of premature newborn's risks observed with ultra sound

R. Rudanovic[1], L. Globarevic[2], M. Rudanovic[3], D. Sturanovic[3], G. Markovic[3]
[1]Neonatology, Children's Clinic, [2]Neonatology, Institute for Children's Illness, [3]Institute for Children's Illness, Podgorica, Montenegro

Introduction: Due to sensitivity of ultra sound scan at IVH and periventricular abnormalities and the easiness to do a scan; the protocols of following the newborns have become adequate for examining premature newborns. IVH appears in 40% of premature newborns with PM less than 1500gr, 90% of haemoralgia is appearing in the first three postnatal days, 10% in the first 10 days. PVL could be noticed in 3-10% of premature newborns.
Aim: Defining optimal time for ultra sound of CNS of premature newborns with GS less than 37 and TM less than 1500gr. in whom abnormalities will develop due to prematurity and damages that will later affect psycho-motor development.
Method: Study of treatment of newborns from 2002 to 2008 at the Centre for Neonatology. In this period we treated 3466 newborns.1361 of premature newborns of less than 37 GS weeks. 479 newborns were chosen with GS less than 34 weeks and TM less than 2500gr. Out of 379 newborns died during treatment. Out of 317 in 248 ultra sound was done three times, 32 twice and 37 once.
Discussion: IVH was diagnosed in 65% during the first week. Cystic PVL is appearing later. Ventriculomegalia is seen 50% of cases at the first ultra sound check-up. 25% is visible after 28 days.
Conclusion: Serious changes appear usually in the smallest newborns and clinically significant changes appear later. In premature newborns with PM less than 1000gr. ultra sound should be done four times.

P2437

Tolosa-Hunt syndrome - diagnostic and therapeutic difficulties in a child

K. Pienczk-Reclawowicz, E. Pilarska, M. Lemka, S. Konieczna
Developmental Neurology Department, Medical University of Gdansk, Gdansk, Poland

Aim: To present a case of THS in a child, to show THS diagnostic and therapeutic difficulties, to discuss differences between paediatric and adult-onset THS.
Case report: A 14-year-old girl was admitted to the Developmental Neurology Department, Medical University of Gdansk due to left-sided frontal headache and retro-orbital pain of subacute onset and left VI cranial nerve paresis. CT, MRI/MRA did not show any abnormalities. Steroid therapy was started (low doses of dexamethasone). The pain resolved completely after 3 days, however, it took almost a week for diplopia to disappear. The steroids were gradually reduced. Within 24 hours the girl reported recurrence of severe pain at the same location. Left eyelid, exophthalmos, paresis of the left IV and VI cranial nerves were observed. Repeat MRI/MRA showed narrowing of the carotid artery within cavernous sinus and post-gadolin enhancement of fatty tissue within the left orbit of inflammatory origin. Steroid therapy was restarted. Total reduction of treatment was possible not before 4 months. The girl remains asymptomatic. Total regression of neuroradiological changes was obtained. Prolonged steroid therapy resulted in significant side effects.
Conclusions:
(1) Only few cases regarding Tolosa-Hunt syndrome in children have been reported so far.
Scarcity of data on paediatric THS result in non-specified differences between THS course in children and adults.
(2) Diagnosis of THS is difficult, requires a wide range of investigations. Neuroimaging studies initially can be normal in mild onset paediatric THS - repeat studies are necessary.
(3) Specified algorithm of steroid therapy in THS patients should be established.

P2438

Corrected Q-T interval in breath-holding spell

H. Mottaghi, J. Akhondian
Mashhad University of Medical Science, Mashhad, Iran

Background and aims: Breath-holding spell (BHS) is one of the important differential diagnoses of syncope and seizure in paediatric age. Dysautonomia may cause prolongation of corrected QT (QTc) interval in these patients. Prolongation of QT interval in susceptible patients to ventricular tachyarrhythmia may lead to syncope, cardiac arrest or sudden death. The aim of this study was the evaluation of QTc in patients with BHS.
Methods: A retrospective analysis conducted on records of patients with discharge diagnosis of BHS at neurologic clinic of Emam-Reza and Ghaem hospital of Mashhad university of medical sciences from 1999 to 2004.
Results: From 100 patients 48 were male. The mean age was 17.62±11.75 months (range 1-60 mo). All patients of this study had cyanotic BHS. Atypical BHS was seen in 8.8% of patients. The mean of QTc was 420±290msec (Range 370-530msec). 15 patients (15%) had a prolonged QTc.
Conclusion: Although relation and effect of prolonged QTC in BHS is not known but prolongation of QTC interval was seen in a significant number of these patients. Electrocardiography (ECG) should be considered in the evaluation of BHS.

P2439

Short-time fourier transform of electroencephalograms in patients with attention deficit hyperactivity disorder

A. Shapkin[1], M. Goloborod`ko[2], V. Berdennikova[2]
[1]East-Siberian Minimally Invasive Neurosurgical Centre, Russian Academy of Medical Sciences, [2]Department of Neurology, State Medical University, Irkutsk, Russia

Objective was the study and classification of dynamics of the EEG time-frequency structures in patients with ADHD by the short-time Fourier transform (STFT). Electroencephalographic analysis has been made on 63 patients with ADHD, age 7-10. The control group consisted of 18 healthy children. The mathematical and statistical analysis of the data has been performed with MATLAB software using standard functions. With the short-time Fourier transform, the children with ADHD have been divided into 4 groups that differed from each other in dominating harmonics in the frequency spectrum. EEG pattern in group 1 (20.6% patients) produced two dominant harmonics appearing at the limit between theta and delta (3.69±0.13Hz) and theta and alpha (6.9±0.25Hz) bands. The EEG spectrogram in group 2 patients with ADHD had only one more theta harmonic similar in frequency and amplitude to that of low (group 2a (23.8% patients) - 3.87±0.07Hz) or high (group 2b (11.2% patients) - 7.1±0.2Hz) frequency components of the EEG of the patients in group 1. Most of the patients (44.4%) were involved in group 3 that showed high-amplitude low-frequency EEG dominated only by alpha rhythm activity. The results show that the children with ADHD have different electrophysiological characteristics. We suppose that visible EEG changes are associated with pathological involvement of the neuron system under unfavourable metabolic and functional states.

P2440

Stroke and epilepsy in children with inherited metabolic disorders

O. Globa[1], L. Kuzenkova[1], A. Platonova[1], N. Zhourkova[2], O. Kondakova[2], N. Averyanova[2], E. Basargina[3]
[1]Neurology, [2]Membranology and Genetics, [3]Cardiology, Scientific Center of Children Health, RAMS, Moscow, Russia

Aim: Several metabolic disorders are associated with stroke, epilepsy and multiorgan damage. The aim of the study is to examine the clinical spectrum, causes and possible therapeutical strategies for children having ischemic stroke and epilepsy as a part of metabolic disorders.
Methods: Full biochemical and haematological tests, neuroimaging studies (MRI), SPECT in some patients, EEG, ECG, echocardiography. Lactate, ammonia, carnitine level were measured. Molecular genetic investigation.
Results: 27 patients (6 months - 16 years) with stroke in anamnesis and seizures suspected of having metabolic disorders were studied. In 15 children the symptomatic focal epilepsy with different types of seizures, predominantly, with myoclonic seizures where found. 12 patients had ischemic stroke. Stroke-like episodes were in 9 children with mutation and polymorphism in mitochondrial DNA. 3 patients with stroke had the mutation in MTHFR 677C>T, GP111A 1565T>C, PAI-1 F55G>4G. 1 had homocystinuria. In 2 patient strokes occurred as a complication of heart disease. Patients with epilepsy had mitochondrial disorders. 2 children with high-frequency MELAS mutation had no stroke, but epilepsy and mental delay. 3 patients had Leigh disease. 1 epileptic patient suffered from glycogenosis type 3, 1 from hemochromatosis. The treatment of stroke and epilepsy has been primarily directed toward stabilizing systemic factors and management of the underlying causes. Anticonvulsant therapy included levetiracetam with no blocking effects on the oxidative phosphorylation.
Conclusion: The aetiologies of stroke and epilepsy in children had much more aetiologies than in adults and there is evidence that early recognition and initiation of etiological treatment may improve prognosis.

P2441

Clinical and electrographic pattern correlates in neonatal seizures

M. Awadh[1,2], M.E. O'Regan[1]
[1]Fraser of Allander Neurosciences Unit, Royal Hospital for Sick Children, Glasgow, UK, [2]Neurology Department, Ain Shams University, Cairo, Egypt

Background: Clinical recognition of neonatal seizures is challenging. Electrographically (EEG) ictal events have various presentations and clinical decoupling is common with AED. Here, probable correlations between features of EEG seizures, clinical phenomena and outcome are attempted.
Methods: Analysis of routine video EEGs (30minutes) recorded before 44 weeks corrected age neonates at risk or with history of developing seizures.
Results: Of 119 consecutive recordings (2007-2009), 139 EEG seizures were recorded in 25 infants (20 full term, 17 male), only 40 (29%) had clinical correlates; 117 suspect events were captured, 77 (66%) lacked EEG ictal discharge; 11 (44%) babies had only non-ictal events (2 hyperekplexia & benign myoclonus each), 4 (16%) consistently with clinically silent EEG seizures, 5 (20%) with epileptic and non-epileptic events, 5 (20%) with epileptic and clinically silent EEG seizures. None had consistently manifested EEG seizures. No relation was relevant between EEG seizure frequency, onset zone, regional or contralateral propagation and the manifest clinical phenomena. No generalized seizures were captured either in EEG or clinically. 3 EEG seizures less than 10 seconds were associated with subtle events. Mouth twitching was apparent in two cases with ipsilateral Rolandic ictal discharges.
Presence of EEG seizures was adversely correlated to clinical outcome ($p=0.047$). Their number was highly predictable of post-neonatal seizures ($p=0.002$). This was true for the number of electro-clinical decoupling ($p=0.025$), and captured clinical events ($p=0.001$).
Conclusion: Despite the poor prognostic implications, lack of clinical consistency of neonatal seizures might be explained by the immature cortical topographic functional differentiation.

P2442

Botulinum toxin A injections to upper limbs in children with cerebral palsy: duration of effect

A. Fattal-Valevski[1,2]
[1]Pediatric Neurology Unit, Tel Aviv Sourasky Medical Center, [2]Sackler Faculty of Medicine, Tel Aviv University, Israel

Aim: We report our experience with botulinum toxin A injections to the upper extremities of children with cerebral palsy, focusing on the duration of effectiveness.
Methods: A retrospective chart review was conducted in a paediatric cerebral palsy clinic. 30 consecutive patients, mean age 9.9±5.0 years, had 56 injections during the study. Most patients (n=21) had spastic hemiparesis followed by triplegia (n=5) and quadriplegia (n=4). Children were assessed by a developmental physiotherapist for muscle tone and Manual Ability Classification System (MACS) before and after injections.
Results: The number of injections per patient ranged from one to five, with 16/30 receiving more than one injection. The mean number of muscles injected per session was 4.2±1.6, the pronator teres being the most common (50/56) followed by the flexor carpi radialis (39/56), biceps (38/56), flexor carpi ulnaris (35/56), opponens (21/56) and adductor pollicis (17/56). Functional improvement was apparent after 42/56 injections. Muscle tone decreased significantly ($p<0.001$) as well as the MACS score post-treatment ($p<0.01$). The mean duration of effect was 7.0±3.0 months.
Conclusions: Botulinum toxin A injections to upper limbs result in functional improvement in addition to reduced muscle tone. This effect is retained for longer periods of time than those reported for lower limbs.

P2443

Prevalence of attention deficit hyperactivity disorder (ADHD) in school children in the Al-Qaser district of Jordan

O. Nafi[1], A. Shahin[2], S. Awni[1]
[1]Pediatrics, [2]Faculty Educational Science, Mutah University, Karek, Jordan

Objectives: To determine the prevalence of ADHD, its subtypes, its effect on learning and some of its associations in the Al-Qaser district of south Jordan. Design School based screening study.
Study population: All school children aged 6-12 years, males and females in the Al-Qaser district in southern Jordan were screened.
Methods: Inclusion criteria included hyperactivity, impulsivity, inattention, learning difficulties, and failure in school exams. Arabic version of DMS IV for diagnosis and classification of ADHD questionnaire were applied to all students included in the study.
Results: A total of 4,374 students were screened. 273 cases were positive, a prevalence of 6.24 %. Prevalence was 9% in school boys and 3.7% in school girls, a male to female ratio of 2.4:1 Learning difficulties were as follows: 59.3% for mathematics and 53.1% for language. Consanguinity was present in 34.8% of cases.
Conclusions: ADHD prevalence in Jordan is within the international values, male to female ratio is high in the whole group, as well as in all subtypes. Association with learning difficulties as well as incidence of consanguinity is very high.

P2444

Abstract cancelled

P2445

A vanishing white matter case with clinical, genetic and diffusion tensor imaging findings

P. Topaloglu Tekturk[1,2], Z. Yapici[2], M. Eraksoy[2], A. Dincer[3], M. van der Knapp[4]
[1]Neurology, Yoncali Hydrotheraphy and Physical Theraphy Hospital, Kutahya, [2]Neurology, Istanbul University, Istanbul Medical Faculty, Department of Child Neurology, [3]Radiology, Acibadem Hospital, Istanbul, Turkey, [4]Child Neurology, VU University, Department of Child Neurology, Amsterdam, The Netherlands

Vanishing white matter (VWM) disease is a leukoencephalopathy of identified genetic background, characterised by cystic degeneration and progressive vanishing of white matter. After normal early development, affected children show a chronic-progressive motor deterioration with spasticity, ataxia and additional worsening following minor head trauma, febrile infection and acute fright. The basic defect of VWM resides in one of the five subunits of eukaryotic translation initiation factor eIF2B. We describe a 9-year-old girl with a history of delayed developmental milestones. At the age of 6 gait disorder was noticed and neurological examination revealed mild pyramidal and cerebellar signs. In her genetic analysis, c.674G>A/p.Arg225Gln mutation in the EIF2B5 gene was detected. Her MRI showed an abnormal signal of bilateral periventricular cerebral white matter with relatively spared U fibres, corpus callosum, and cystic formations on FLAIR and T2-weighted images. There was no contrast enhancement. Magnetic resonance spectroscopy (MRS) obtained from the left frontal white matter including the cystic parenchymal changes revealed a mild decrease in NAA/Cr ratio and an increase in Cho/Cr ratio. Lactate peak was also barely seen in short TE spectra. Diffusion tensor imaging (DTI) demonstrated extensive involvement of the supratentorial white matter. Quantitative analysis of DTI parameters showed generalized FA fractional anisotropy reduction and an increase in apparent diffusion coefficient ADC values throughout the supratentorial white matter.
Our findings indicate that DTI analysis in vanishing white matter VWM disease has the potential to be an important and routine marker of white matter pathology.

P2446

Assessment of neurological problems in autism spectrum disorder and ADHD

W.S. Kim[1], J.Y. Sim[1], H.J. Park[2]
[1]Pediatrics, Chungbuk National University Hospital, Cheongju, [2]Pediatrics, Eulji University School of Medicine, Daejun, Republic of Korea

Objectives: Autism spectrum disorder (ASD) and attention-deficit hyperactivity disorder (ADHD) are neurodevelopment disorders. Authors studied neurological problems in ASD and ADHD.
Method: We studied 49 children with ASD and 49 children with ADHD who visited our hospital neuropsychiatric clinic from January 1999 to December 2008. We studied age, EEG abnormality, developmental delay, seizure in two groups.
Results:

1) The mean age of diagnosis in children with ASD is 4 years and in ADHD it is 9 years. (P value 0.000)
2) The percentage of abnormal EEG in children with ASD is 54.5% and in ADHD 24.5%. (P value 0.027)
3) The percentage of developmental delay in children with ASD is 89.8% and in ADHD 19%. (P value 0.000)
4) The mean age of first seizure in children with ASD is 13 years and in ADHD 6 years. (P value 0.005)
5) The percentage that EEG is normalized when children with ASD follow up EEG is 66.7% and in ADHD 16.7%. (P value 0.03).

Conclusions: The percentage of abnormal EEG and developmental delay in children with ASD is more than in ADHD, the mean age to be diagnosed in children with ASD is younger than in ADHD, the mean age of first seizure in children with ASD is higher than in ADHD and the percentage that EEG is normalized when children with ASD follow up EEG is higher than in ADHD.

P2447

L-arginine therapy for mitochondrial encephalopathy with lactic acidosis and stroke-like episodes

K. Fujii, M. Suyama, T. Shiohama, M. Endo, H. Mizuochi, Y. Kohno
Paediatrics, Chiba University Graduate School of Medicine, Chiba, Japan

Background: Mitochondrial encephalopathy with lactic acidosis and stroke-like episodes (MELAS) is a rare metabolic disorder without any specific fundamental therapy. L-arginine has recently been found to resolve the vasoconstriction, suggesting the therapeutic usefulness for rescue of acute stroke-like episodes in MELAS. However, little has been reported whether this medicine becomes a reliable therapy for acute stroke-like episodes of MELAS or not.
Objective: We examined intravenous L-arginine treatment to know whether it becomes a useful therapy for acute stroke-like episodes of MELAS or not. The protocol of this regimen was derived from the L-arginine therapy study group for MELAS in Japan (LSGMJ).
Materials and methods: We applied 500mg/kg of intravenous L-arginine to a 15-year-old male MELAS patient having A3243G mutation in acute phases of stroke-like episodes, after getting informed consent which was already approved by local ethics committee in Chiba University. Neurological symptoms were evaluated by clinical observation of headache, loss of consciousness, visual disturbance and paralysis, and brain imaging techniques such as CT and MRI.
Results: We examined L-arginine therapy twice in acute episodes of stroke-like episodes of the patient. Neurological symptoms gradually improved without any neurological exacerbation after application of intravenous L-arginine. The patient did not experience further stroke-like episodes for subsequent two years. We found no serious side effects associated with this therapy.
Conclusion: We conclude that L-arginine therapy seems to be a useful therapy for acute stroke-like episodes of MELAS. Randomized control study should be planned in order to establish the usefulness of L-arginine therapy.

P2448

Nerve conduction abnormalities in children with type I diabetes

G. Natriashvili[1], D. Chkhartishvili[2]
[1]Neurology, Georgian National University, [2]Neurology, National University of Georgia, Tbilisi, Georgia

Introduction: As it is well known, distal symmetric sensorimotor polyneuropathy is a common complication in adults with diabetes mellitus. Although nerve conduction studies (NCS) may show some abnormalities in diabetic subjects without clinically manifest peripheral neuropathy, their clinical relevance remains to be defined.
Aim: Our aim was to assess possible abnormalities of peripheral nerve conduction in children with type I diabetes.
Material and methods: 42 children (aged 5-16 years) with type I diabetes underwent conventional nerve conduction study, which included testing of median, ulnar, peroneal and tibial motor nerve conduction velocities (MNCVs), M-response amplitudes, as well as ulnar, median and sural sensory nerve action potential (SNAP) amplitudes, onset latencies and conduction velocities. A control group included 10 healthy children aged 5-16 years.
Results: In 16 children (age 5-12y) with disease duration <5y, and with clinically well controlled diabetes, MNCVs and M-response amplitudes were nearly normal. Sensory nerve conduction study did not show any abnormalities. In 26 children (age 12-16y) with disease duration >5y and poor metabolic control, we found abnormally slow MNCVs and decreased M-response amplitudes in all above mentioned nerves, whereas in sensory nerve studies all parameters remained nearly normal compared to the age-matched controls. None of the patients showed overt clinical signs of peripheral neuropathy.
Conclusion: In children with type I diabetes nerve conduction studies showed predominantly motor nerve dysfunction, especially in children with disease duration >5y and with poor metabolic control, rather than sensory nerve conduction abnormalities.

P2449

Vertigo in paediatric migraineurs

E. Pilarska, M. Lemka, K. Pienczk-Reclawowicz
Developmental Neurology Department, Medical University of Gdansk, Gdansk, Poland

Purpose: The aim of the study was to assess the frequency of vertigo in paediatric migraineurs, to evaluate if vertigo was a symptom of migraine aura, migraine headache or a symptom appearing between episodes of migraine headaches (including the diagnosis of benign paroxysmal vertigo of childhood).
Material and methods: A study group consisted of 43 migraineurs hospitalised in Developmental Neurology Department, Medical University of Gdansk between 2004 and 2009. 13 children were excluded from the survey due to the history of head trauma, other neurological diseases (e.g. epilepsy) or other disorders which could present as vertigo (e.g. otorhinolaryngological diseases, hypertension). 14 children were diagnosed with migraine without aura and 16 with migraine with aura (10 with visual and 6 with sensory aura). In 10 children family history of migraine was positive (6 mothers, 4 fathers). Coexistence of tension-type headaches was present in 10 migraineurs (33%). Pediatric, otorhinolaryngological, ophthalmological, psychological examinations and neuroimaging were performed in all children.
Results: 52% of children with migraine suffered from vertigo. In 12% of migraineurs the benign paroxysmal vertigo was diagnosed. In 10% vertigo was the symptom of migraine attacks; more often it was a sign of aura (15%). We did not find statistically significant difference in frequency of vertigo between patients with visual and sensory aura.
Conclusions: Vertigo is a common ailment among children with headaches. Paediatric migraineurs experience vertigo particularly often. In most cases vertigo is a part of migraine aura, however the type of aura seems to be insignificant.

P2450

Efficiency estimation of transcutaneous electrostimulations of spinal cord in correction of functional disturbance in ADHD

A. Shapkin[1], Y. Shapkin[1], M. Taborov[2], M. Goloborod`ko[3], V. Berdennikova[3]
[1]East-Siberian Minimally Invasive Neurosurgical Centre, Russian Academy of Medical Sciences, [2]Institute of Solar-Terrestrial Physics SB RAS, [3]Department of Neurology, State Medical University, Irkutsk, Russia

The research objective was the estimation of efficiency of a transcutaneous electrostimulations technique of the spinal cord for correction of a brain functional state in ADHD. Our study was performed in 30 children at the age from 7 till 10 years with verified ADHD diagnosis. TESC was carried out with 4 spine points ({+} Th3-4 {-}Th 7-8 {-} Th12-L1 {+} L3-4) a pulse current with 20Hz frequency. Functional diagnostics spent by EEG registration (10-20% system) before and after an electrostimulation course. Spinal cord electrostimulation was authentically accompanied by normalisation of a functional state of brain that was expressed in paroxysmal index decrease (rate of EEG paroxysmal phenomena) from 9-12% to 2-3%, reduction of rate of occurrence additional teta harmonics in EEG spectrum and decrease of total EEG amplitude. TENS is a simple and safe method of functional correction disturbance in minimal brain dysfunctions.

P2451

SCHIZENCEPHALY – correlation between clinical and neuroimaging features

R.I. Teleanu, M. Moiceanu, M. Sandu, D. Plesca
Pediatric Neurology, V Gomoiu Children's Hospital, Bucharest, Romania

Introduction: Schizencephaly represents an uncommon malformation of cortical development due to an abnormal neuronal migration, characterized by a congenital linear cleft spanning the cerebral hemispheres from the lateral ventricle to pial surface, with a pathological pial – ependymal continuity. The gray matter lining this clefts is frequently polymicrogyric. The clefts can be unilateral or bilateral.
Patients and method: We report the clinical and imaging features of 14 children, of whom 10 had unilateral and 4 had bilateral schizencephaly. Their ages at the time of the first presentation ranged from 8 months to 11 years. They were studied from clinical, epileptic, electroencephalographic and imaging points of view. 6 patients were investigated by cranial computed tomography, 5 by magnetic resonance imaging, and 3 by both methods.
Results and discussions: Epilepsy was found in 9 patients (64.28%). The degree of malformation was not related to the severity of epilepsy. The clinical features consisted of mild hemiparesis in 5 cases, tetraparesis was present in 3 cases, severe hypotonia in 1 case and 5 had no motor deficits. Mental retardation was observed in 8 cases (57.14%) and was observed significantly more often in bilateral clefts. The aim of this study is to underline the importance of modern imagistic techniques (especially MRI) in earlier diagnosis of schizencephaly. We conclude that children with schizencephaly usually have variable neurological impairments.

P2452

Responding to the autism epidemic: creating clinical, academic and clinically based programs in Northern Texas

P.A. Evans
Pediatric Neurology, University of Texas Southwestern School of Medicine, Dallas, TX, USA

Over the last 20 years, the United States has witnessed an explosion of new cases of autism, now calculated at 1 child in every 92. Many reasons have been postulated, among them the broader inclusion of milder cases of autism within the DSM-IV, the federal mandates to provide better services for any child whose diagnosis falls under the autistic spectrum, as well as the evolution of more isolated children within urban and suburban communities, whose access to spontaneous and interactive play is increasingly limited by social and economic factors. With such critical need, this paper describes the successful implementation of a multi-disciplinary approach to solving the myriad issues of identifying, diagnosing, and providing multi-disciplinary approaches to children and adolescents of all financial levels in North Texas. The approach has been successful to large degree because of wide-spread and clearly stated goals of many individuals and agencies within the north Texas area working together to address a widespread and common problem. As a result, an ACGME accredited fellowship for neurodevelopmental disabilities has been created, and has sought to actively involve many therapeutic agencies within the north Texas communities in an effort to provide training to professionals, as well as medical and therapeutic support to autistic children and their families.

P2453

Understanding and speech production in pre-school children

S.M. Golubovic[1], L.S. Filipovic[2]
[1]*Speech and Language Pathology, Faculty of Special Education and Rehabilitation, University of Belgrade, Belgrade, Serbia,* [2]*'Bambi' Tivat, Tivat, Montenegro*

The process of understanding language consists of phonological, grammatical and semantic decoding. The aim of this study was to determine articulation status of children aged 5 to 6, which refers to the situation excuses votes: vowels in the initial pass, the initial consonants, medial and final position, understanding the speech of children, and the level of production, which refers to the segment structure in spontaneous speech voice expression, segment dictionaries and the frequency and appropriate use of the word when describing the given image, the appointment displayed cases and adequate definition of the word given verbally.

Methodology: We examined a sample of children consisting of 128 children, aged 5 to 6 years living in the municipality of Tivat. To assess the pronunciation of votes we used Test of articulation (Vuletic, D., 1990), and to assess understanding and speech production Reynell's revised scale of speech (1987, 1995). Both tests were used to test and retest method at an interval of 3 months.

Results: The results showed poor articulation status of pre-school children in the municipality of Tivat. At least 33% had differences in pronunciation of the vote, while the upper limit went up to 60%. Deviations in the articulation votes correlate with a lower score on the test speech understanding, and with lower score in the dictionary.

P2454

Management of neonatal seizures (update 2010)

A.A. Mahmoud
Pediatric Neurology, KFMC, Riyadh, Saudi Arabia

Here I critically review literature on treatment of neonatal seizures to generate guidelines for the use of anticonvulsants in neonatal seizures (Birth – 1 month of corrected age). Among 431 articles and 126 review articles, I chose: 56 articles and 14 review articles, I went through relevant trials from 1966 till Present. Review articles: From 1980 till Present, Medline, Cochrane, hand search. I selected all R.C.Ts, Cohort Series, Case reports and Case Series. I documented the study design, randomization, strategy for allocation concealment, blinding, source and characteristics of subject, number of subjects, treatment details and side effects, duration of the study, and outcome measures. Thomson Criteria were applied for level of evidence with subsequent postulation of grading of recommendations. At the end a sort of guidelines for management of neonatal seizures was suggested keeping in mind the new antiepileptic drug usage despite the absence of FDA or EMEA approval, yet. I included all the studies concerning Carbamazepine, Lamotrigine, Valproic Acid, Chloral hydrate, benzodiazepines, Topiramate, Phosphenytoin, Levetiracetam in addition to the studies that were meant for the routine drugs that have been so long in use, namely, Phenobarbitone and Phenytoin. Also mentioned were the studies about drugs used only in specific situations like Pyridoxine or Pyridoxal Phosphate, Biotin, Folinic Acid. Due to the progressively increasing reports on ketogenic diet use in early infancy including the neonatal period, I made analysis of good articles that are related of neonatal seizure management. Surgery for management of seizures in this age group was mentioned as per reported cases.

P2455

Topiramate for migraine treatment in children and adolescents

I. Shchederkina[1], V. Karlov[2]
[1]*Neurology Clinic, Clinical Center of Sarajevo University, Clinic of Morozovsky Children Hospital,* [2]*Neurology, Moscow State Medicai Stomatology University, Moscow, Russia*

Objectives: Children with previous treatment failure and with frequent (more than twice a month) attacks of migraine with or without aura.

Aim: Study topiramate efficacy in migraine.

Material and methods: Clinical examination, EEG.

Results: We observed 68 children suffering from migraine (27 without aura (MA-) and 41 with aura (MA+) for more than 1 year. 25% of MA- children (all with pathological EEG signs) had previously received anticonvulsants. More than 50% of MA- children had weekly migraine attacks.15 MA- children received topiramate, and 11 remained on treatment. 1 month after therapy initiation all children noted improvement of headache, and 3-6 months later headache attack frequency was reduced by 50% in 75% of children. Treatment duration varied from 3 to 9 months with a daily topiramate dose 50-150mg. 7 of 41 MA+ children had previously received anticonvulsants for pathological EEG signs. 12 M+ children with 2 and more headache attacks per month received topiramate. 9 of them remained on treatment. Treatment duration varied from 3 to 9 months with a daily topiramate dose 50-150mg. 3 months after treatment initiation headache was absent in all patients, though 2 of them (22%) had "beheaded" migraine.

Conclusion: Topiramate was effective for treatment of MA- and MA+ in children. The drug doses for these indications were somewhat less than that used in epilepsy. Topiramate was more effective in MA+ patients as compared to MA-. Some MA- patients receiving topiramate experienced headache transition to tension headache. Duration of topiramate treatment needs to be clarified

P2456

The content of noradrenaline in blood serum in children with tic disorders

I. Fedoseeva[1], T. Poponnikova[1], L. Galaganova[2]
[1]Kemerovo State Medical Academy, [2]Kemerovo Government University, Kemerovo, Russia

The catecholamine content in blood serum can reflect peculiarities of neuromediator's metabolism in the CNS. To research the changes of noradrenaline metabolism in children with hyperkinetic syndrome the noradrenaline content in blood serum of 28 children 6-16 years old with tic disorder was analyzed by using immunosorbent assay. The disease duration was from 1 to 9 years: less than 1 year in 9 (32.1%) cases, 2-4 years in 11 (39.3%) cases, 5-7 years in 5 (17.9%) cases, 8-9 years in 3 (10.7%) cases. Secondary perinatal tic disorders prevailed. In 26 cases (92.9%) the local (facial) and facio-cranio-brachial tic disorders were diagnosed. Generalized tic was observed in 2 cases (7.1%). In all cases the hyperkinetic syndrome was accompanied by various kinds of behaviour disorders with different levels of clinical manifestations. It was detected a reliable descent of noradrenaline content in blood serum in children with tic disorder compared with the group of healthy children. The level of noradrenaline concentration in blood serum of the patients was less (119.0±60.8pg/ml) in comparison with the control group data ($p<0.05$). No correlation between the noradrenaline content in blood serum and the disease duration was found ($r=0.12$). The authors suppose that metabolism of noradrenaline takes part in pathogenesis of tic disorder, emotional and behavioural disorders.

P2457

Assessment of the results of Doppler cerebral blood flow measurement in infants with hypoxic-ischemic lesion of the central nervous system

M.I. Sigatullina, G.M. Tursunkhodjaeva
Neurology, Tashkent Pediatric Medical Institute, Tashkent, Uzbekistan

Objective: Assessment of the results of transcranial Doppler-sonographic (TCD) measurement of cerebral blood flow in preterm infants with hypoxic-ischemic encephalopathy (HIE).
Methods: 86 preterm newborns with HIE have been examined. TCD measurement was conducted. Pulsatility index (PI) and resistive index (RI) in anterior cerebral artery (ACA), basilar artery (BA) and middle cerebral artery (MCA) were calculated.
Results: Ultrasound measurement results showed signs of brain ischemic (in 50% of cases) and intraventricular haemorrhages of 2nd and 3rd degree (30%) with syndrome of cerebral depression, respiratory distress and seizures. The most severe decrease of blood flow in ACA and MCA was associated with decreased PI and RI detected after subdural hematoma operation (before death). In all newborns (n=86) the cerebral blood flow had considerably increased for the first 30 min after birth. In 26 newborns (30%) RI had risen within 2 hours after birth in ACA up to 0.77±0.01, in MCA - up to 0.76±0.01, in BA - 0.78±0.01, and in the end of the 3rd day normalization of parameters of RI was noticed for this group of children (RI (ACA) -0.71±0.01; RI (MCA) -0.72±0.01, RI (BA) -0.75±0.01). In 13 children (15%) with severe degree of HIE increasing of RI in MCA and BA with relative normalization of cerebral blood flow was noticed only on the 7th day.
Conclusion: The compensatory increase of cerebral blood flow in the main arteries of the brain was found in children with severe degree of hypoxic central nervous system damage.

P2458

Subclinical abnormalities of motor nerve conduction in children with cerebral palsy

G. Natriashvili, D. Chkhartishvili
Neurology, National University of Georgia, Tbilisi, Georgia

Introduction: Cerebral palsy (CP) is a syndrome with clinical manifestation of cerebral perinatal injury, which has various traumatic mechanisms.
Objectives: Our aim was to detect nerve conduction abnormalities in full term born children with CP.
Methods: 16 full term born children (7 boys) with cerebral palsy aged 9-14 months underwent conventional motor nerve conduction (MNC) testing. The study protocol included testing of median, ulnar, peroneal and tibial MNC. All patients showed clinical signs of upper motor neuron lesion. A control group included 15 healthy age matched subjects.
Results: In all patients we revealed considerably decreased conduction velocities in all above motor nerves compared with age match healthy controls.
Conclusions: In children with CP MNC study may reveal decreased nerve conduction indicating of peripheral nerve dysfunction (hypomyelination) in addition to cerebral injury during perinatal period.

P2459

S-100 in children with perinatal hypoxia

E. Hadjiu[1], A. Hadjiu[2], S. Hadjiu[2], I. Ilciuc[2], C. Calcii[2], L. Cioban[2]
[1]Neuropediatrics, State Medical and Pharmaceutical University „Nicolae Testemiţanu", [2]Neuropediatrics, The State University of Medicine and Pharmacy "Nicolae Testemiţanu", Chisinau, Moldova

Background: The increasing of S-100 protein in the serum of children with perinatal hypoxia is an efficient test that can be used for precocious recognition of cerebral injuries in perinatal hypoxic ischemia.
Methods: The study included 78 children aged 1-2 weeks that put up with intrauterine hypoxia, born by mothers with gestose during pregnancy. There were 45% - prematurely, 39% - in term, 16% - other term born children. The S-100 protein from blood serum was recognised in all the patients.
Results: The intrauterine hypoxia initiates processes that lead to the augmentation of permeability of cells' membrane, the neuron and glial cells demolition as a result of necrosis and/or apoptosis, the structural deregulation of haematic-encephalic barriers, the formation of cerebral antibodies that initiate the immune system to produce and launch auto cerebral antibodies. The study showed an increase of the level of S-100 proteins and it was even the biggest in the prematurely born children. That allowed us to conclude that injuries' effects are worse in prematurely born children in comparison with those born in term ($p<0.05$) and in those born other term in comparison with those born in term ($p<0.01$). The increased level of S-100 allows to forecast hypoxic-ischemic affections and the increase of protein other ng/ml is associated with an unfavourable prognosis.
Conclusions: S-100 test is an appreciation marker of the brain injuries' severity in children with perinatal hypoxia and serves as prognosis indicator for neurological disabilities in all cases.

P2460

Clinical manifestations and MRI in children with neurofibromatosis type I

V.S. Bojinova, G.G. Sarajlieva, D. Todorova, P. Dimova
Clinic of Child Neurology, University Hospital of Neurology and Psychiatry 'Sv. Naum', Sofia Medical University, Sofia, Bulgaria

Objective: To characterize the clinical characteristics in children with Neurofibromatosis Type 1 and its correlation with Unidentified Bright Objects (UBO's) or Neurofibromatosis Bright Objects (NBO's) on MRI.
Clinical contingent and methods: 6 children with Neurofibromatosis Type 1 aged from 4 to 16 years were examined neurologically and ophthalmologically, EEG, MRI.
Results: 3 children had optic gliomas located intraorbitally, one side in two and bilateral in one, 1 child had brain stem glioma. 5 children had epilepsy and cognitive impairment, mild in 3, severe in 2 of them, who had also microcephaly. All 6 children had multiple areas of increased T2-weighted signal intensity on MRI, localized in globus pallidus bilaterally (n=2) or unilaterally (n=2), thalamus (n=1), mesencephalon (n=1), cerebellum (n=3), corpus callosum (n=1), subcortical white matter (n=1). In the child with multiple lesions in the corpus callosum, cerebellum and mesencephalon, multiple sclerosis was excluded due to lesions in globus pallidus and thalamus, the lack of relapsing or progressive course of pyramidal and cerebellar tract involvement and normal CSF. 1 child had Moya-moya like vasculopathy.
Conclusions: For neurofibromatosis type 1 most typical were optic gliomas, epileptic seizures, different type of cognitive impairment, which correspond to microcephaly, severe epilepsy and multiple UBOs on MRI and Moya-moya like vasculopathy.

P2461

Indicators of early imaging in orbital and periorbital cellulitis

S. Dixon[1], R. Singh[1], F. Rotimi[2]
[1]Dewsbury and District Hospital, Dewsbury, [2]St. James's University Hospital, Leeds, UK

Aim: Role of imaging in management of periorbital cellulitis.
Background: Periorbital cellulitis is a common condition in childhood with severe morbidity if not treated timely. It is difficult to clinically differentiate periorbital and orbital cellulitis. Early identification of proptosis directs management and need for surgical intervention. We report our recent experience of two cases.
Case one: A one-year-old presented with pyrexia of three days and worsening left eye swelling. Initial examination revealed marked lid swelling, normal eye movements and fundoscopy, with no proptosis. Intravenous antibiotics were commenced for a left periorbital cellulitis and the swelling improved. On day three, mild proptosis was noted; ophthalmology suggested completing antibiotic therapy only. On clinical suspicion an orbital CT was requested, revealing a collection in the medial left orbit and fluid-filled maxillary and ethmoid sinuses, requiring urgent drainage.
Case two: A 4-year-old presented with one week of coryza, left eye swelling of two days, on oral antibiotics and eye-drops from his GP. He had left periorbital swelling, erythema and difficulty opening his left eye. Intravenous antibiotics were started and CT arranged due to no improvement after 48 hours. This was initially misinterpreted as just post-septal cellulitis with pan-sinusitis but no obvious abscess. On tertiary review there was reported to be an orbital abscess requiring urgent surgical drainage.
Conclusion: Identifying proptosis is difficult in periorbital cellulitis because of associated periorbital swelling. Cranial imaging is useful to aid management if there is doubt, or no significant improvement after 48 hours of antibiotic therapy.

P2462

Multiple sclerosis in children

J. Paprocka[1], E. Jamroz[1], J. Pytel[2], K. Szczechowska[2]
[1]Child Neurology Department, [2]Child Neurology Department, Student's Scientific Society, Silesian Medical University, Katowice, Poland

Multiple sclerosis is a chronic demyelinating disease affecting the central nervous system. The causes and accurate pathogenesis of the disorder are still unclear, although experimental models provide evidences of autoimmune basis of the disease. The estimated occurrence of MS is 3.6 cases per 100,000 person-years in women and 2.0 in men, and 2 to 5% of patients' experiences their first symptoms before the age of 18. The diagnostic criteria in adult patients are based mainly on clinical presentation, MRI features and CSF examination. It has been shown however that the sensitivity and specificity for McDonald MRI criteria is lower in paediatric-onset than in adult-onset MS. Efficient establishment of proper diagnosis in young patients became even more challenging if we consider the wide range of disorders that may be difficult to distinguish from MS, like ADEM or inborn errors of metabolism, leukodystrophies and others. The authors analyzed a group of 33 children hospitalized in the Child Neurology Department in Katowice in the years 2000-2009. Average age at diagnosis was 15 years (range 5-17). Patients presented with following initial symptoms: optic neuritis - 17%, sensory and motor disorders - 52%, cerebellar and brain stem symptoms - 24%, polysymptomatic - 7%. In all patients MRI was performed, CSF examination and evoked potentials. The aim was to estimate the value of mentioned diagnostic tests in the establishment of the diagnosis of paediatric MS.

P2463

Prevalence of cerebral palsy among children in Bosnia

A. Bajraktarevic[1], S.M. Gusic[1], A. Skopljak[1], V. Drekovic[1], S. Uzicanin[2], A. Djurdjevic Djulepa[3], Z. Jatic[4], E. Hadzihasanovic[5], I. Suljevic[6]
[1]Pediatrics Department, Public Health Institution of Canton Sarajevo, [2]Neuoropediatrics Department, Pediatrics Clinic, [3]Perinatology Department, General Hospital Sarajevo, [4]Institute for Social and Family Medicine, Medical Faculty Sarajevo, [5]Pediatrics Department, First Medical Aid, [6]Biochemistry Department, Clinical Medical Center Sarajevo, Bosnia-Herzegovina

Background: Cerebral palsy can be difficult to diagnose in very young children. Spastic Cerebral Palsy, the most common form of CP, causes the muscles to be tense, rigid and movements are slow and difficult.
Aim: The goal was to estimate the prevalence of cerebral palsy and cerebral palsy subtypes among children in all seven areas of Bosnia and Herzegovina by using a kids' population-based surveillance system.
Methods: The statistical analyses were weighted to take into account the differences in the proportions of children who underwent follow-up monitoring according to gestational age and region of Bosnia and Herzegovina. Cross-sectional data were collected through retrospective record review from multiple sources.
Results: Cerebral palsy occurs in about 4 of every 1000 live births in Bosnia and Herzegovina. There was no difference between the 2 groups regarding cranial ultrasound abnormalities. Mortality did not change significantly through 1995, and then began to decrease in 1995 to 2010.
Discussion: Other limitations of this study include the absence of neuroimaging information so that sub-grouping of case children could be based only on clinical CP subtype, not on morphologic substrate.
Conclusions: Cerebral palsy (CP) is not a disease or an illness. It is the description of a physical impairment that affects movement. The diagnosis of cerebral palsy has historically rested on the patient´s history and physical examination. Some causes of cerebral palsy can be prevented.
Keywords: Cerebral palsy, Children, Prevalence, Diagnostic.

P2464

The impact of Ab-antiphospholipids during the brain immaturity stage of newborns, coming from mothers with imminence of abortion

L. Ciobanu
USMF 'Nicolae Testemitanu', Chisinau, Moldova

Background: Researches of several aspects of the immunologic impact, which hinders the maturation process of the nervous system of foetuses and newborns coming from mothers with a history of risk of abortion. We studied the phospholipid level and Ab-antiphospholipids in the blood cells of these pregnant and their newborns. The phospholipids serve as plastic material, producing neuronal and cell membranes (phosphoglycerols), and myelin (swingophospholipids). Emergence of Ab-antiphospholipids at placental level, leads to alterations through antigenic similarity between the phospholipids from neuronal membranes and myelin, thus perturbing the development and maturation of the nervous system of foetus.
Methods: We studied 140 pregnant women (95 with risk of abortion - studied lot; and 45 with physiologic pregnancy - controls) and the respective newborns (95 - studied lot; 45 - controls) studied clinically (newborns - including neurologically), para-clinically, bio-chemically (including general phospholipids) and immunologically (Ab-antiphospholipids; Ab-antiglycolipins; Ab-anticardiolipins; and Ab-anti-sphingomyelins).
Results: The general phospholipids level in the studied lot was increased at 85 (89.5%) pregnancies/ 70 newborns (73.7%), versus controls - 18 (40%) pregnancies / 19 (42.2%) newborns. Ab-antiglycolipins positive: 18 (19%) pregnancies/ 25 (26.3%) newborns in the studied lot versus 3 (6.7%) pregnancies/ 8 (7.8%) newborns in controls. Ab-anti-sphingomyelins positive: 27 (28.4%)/ 35 (36.8%) versus 0 (0.0%)/ 6 (13,3%).
Conclusion: In cases of diagnosing the immunological conflict in cases with risk of abortion, characterized by an increased amount of Ab-antiphospholipids, the compensatory growth of general phospholipids indirectly indicates an imaturation of the nervous system of the newborns. This explains the staggering incidence of neurological pathologies of the newborns in such cases.

P2465

Moya-moya disease mimicking herpes encephalitis

M.H. Aelami[1], M. Khalesi[2], J. Akhondian[2]
[1]Pediatrics, [2]Mashhad University of Medical Science, Mashhad, Iran

Introduction: Moya-moya disease is a rare progressive vaso-occlusive disorder of unknown etiology that is characterized by stenosis of the internal carotid arteries with spontaneous development of a collateral vascular network.
Case report: A 15-month-old girl referred to our emergency ward due to a decreased level of consciousness, focal seizures and fever since one day ago with impression of encephalitis. Physical examinations revealed a left side hemiparesis. Brian CT-Scan showed a hypo-dense lesion in the left temporal region in favour of herpes encephalitis. Initial therapy with vancomycin, ceftriaxone and acyclovir was continued. CSF analysis did not show any abnormality. Blood and CSF cultures results were negative. Brain MRI showed hyper-intensity at right frontal and parietal region suggesting a vascular lesion. Laboratory work up for stroke such as ANA, protein C and S, Antiphospholipid antibodies, antithrombin III, triglyceride and cholesterol, PT and PTT all were normal. MR angiography showed bilaterally multiple torsions in vessels at the basal ganglia consistent with Moya-moya disease.
Conclusion: In all children presenting with encephalitis, vascular events such as Moya-moya disease should also be considered. MRI is a sensitive tool for this purpose.
Our case was an instance of primary Moya-moya that is very rare out of Japan.

P2466

2OH glutaric aciduria (2OHGA) in 14 Tunisian patients

E. Ellouz[1], F. Kammoun[2], E. Mnif[3], H. Ben Othmen[4], Z. Mnif[5], F. Ayedi[3], N. Kaabechi[6], C. Triki[7]
[1]1- Department of Pediatric Neurology, [2]EPS Hedi Chaker, [3]Biochemical Laboratory, CHU Habib Bourguiba, [4]Neuropediatric Search Unit, [5]Radiologic Department, EPS Hedi Chaker, Sfax, [6]Biochemical Laboratory, La Rabta Tunis, Tunis, [7]Department of Pediatric Neurology, EPS Hedi Chaker, Sfax, Tunisia

Introduction: The 2OH glutaric aciduria is a neuro-degenerative disorder characterized by a primary involvement of cerebral white matter, progressive evolution, and increased urinary excretion of 2OH glutaric acids. The aim of this study is to determine clinical and radiological features of 2OHGA.
Methods: We reviewed all patients with the diagnosis of 2OHGA. Clinical examination, organic and amino acids chromatography and cerebral MRI were performed for all patients. Only 9 patients had lumbar puncture with lactate level in CSF, and multimodal evoked potentials.
Results: We compiled 14 patients from 5 consanguineous families. The mean age was 15 years. Febrile seizures were noted in 9 patients. An early onset encephalopathy with psychomotor delay, cerebellar ataxia and then spastic paraplegia (SP) was noted in 8 patients. The others developed at a mean age of 9 years a psychomotor regression associated to cerebellar ataxia and SP. Macrocephaly was noted in 5 patients. All patients had sub cortical leukodystrophy, with involvement of basal ganglia and dentate nucleus.
Conclusion: The clinical phenotype of 2OHGA varies according to the age of onset, but all patients share similar radiological findings including sub cortical leucodystrophy and involvement of basal ganglia. Febrile seizures and macrocephaly are common.

P2467

Metachromatic leukodystrophy – a late infantile form

J. Paprocka[1], E. Jamroz[1], J. Gawryluk[2]
[1]Child Neurology Department, [2]Child Neurology Department, Student's Scientific Society, Silesian Medical University, Katowice, Poland

Metachromatic leukodystrophy (MLD) is a genetically determined lysosomal storage disease. As a result of low activity of arylsulfatase A (ASA) or its activator protein saposin B occurs in the lysosomal accumulation of glycolipids of peripheral and central nervous system, endocrine glands and visceral organs. The gene for MLD is located on chromosome 10q21.22 (ARSA gene: A, I allele). The aim of this study was to analyze the clinical picture and results of additional examinations of 5 children diagnosed with metachromatic leukodystrophy.
Material: The analysis included 5 patients of age 2 to 6 years hospitalized in the Child Neurology Department of Silesian Medical University in Katowice, Poland.
Results: The first clinical symptoms in the form of arrest of psychomotor development/ loss of the developmental milestones, and gait disturbances occurred in children between 14 and 23 months of age. The neurological examination usually showed progressing pyramidal signs associated with peripheral neuropathy. In magnetic resonance imaging (MRI) extensive dys- and demyelinating changes were seen. Nerve conduction velocity in all children showed features of axonal-demyelinating neuropathy. Low activity of ASA helped to confirm the diagnosis of metachromatic leukodystrophy. All patients were diagnosed with late infantile form of MLD, what was also proved by molecular study.
Conclusions: Clinical spectra, progressive course of the disease, typical localization of white matter changes prompted the diagnosis of MLD. Molecular analysis shows two alleles, A and I, contributing to the different clinical expressions of the disease. Late infantile form is associated with homozygosity for A or I allele.

P2468

Antiphospholipid antibodies in children with epilepsy

C. Calcii[1], C. Tsurcan[2], I. Iliciuc[3], S. Hadjiu[3], L. Morosan[3]
[1]Department of Child Neurology, Hospital of Mother and Child Health Care, [2]Medical University of Moldova, [3]Hospital of Mother and Child Health Care, Chisinau, Moldova

Aim: Increased prevalence of autoantibodies has been suggested in patients with epilepsy. The effectiveness of immunomodulatory treatments in cases with childhood epilepsies suggests the role of immune mechanisms in the pathogenesis of this disease. The purpose of this study was to determine antiphospholipid antibodies (aPLs, immunoglobulin G class), in children with epilepsy.
Methods: We studied 60 children (34 boys and 26 girls) with a mean age of 2.1 years (range 0.1-4.2 years).The control group consisted of 70 healthy subjects, mean age was 2.4 years. The mean age of onset of epilepsy was 1.2 years (range 0.2-2.2). None of the children had any clinical signs of immune system disorders. The type of epilepsy was partial in 42 patients, primary generalized in 13 cases and unclassified in 5 patients.
Results: In the study group, there were higher numbers (16 cases) of aPLs immunoglobulin G class positive subjects (26.6%) compared with controls (4 cases-5.7%) (p=0.011). These antibodies were common (77-84%) in children with multiple seizure types often associated with symptomatic etiology, early onset and high frequency of seizures.
Conclusion: Even though the significance of these autoantibodies remains unknown, their increased prevalence indicates that immune system mediated mechanisms may play a role in the manifestation of epilepsy in some children, especially in the subgroups of early-onset, high-seizure-frequency, therapy-resistant epilepsies with multiple seizure types.

P2469

Airplane headache in children: a report of two cases

H.I. İpekdal[1], G. Erdem[2], Ö. Karadaş[3]
[1]Mareşal Çakmak Military Hospital, [2]Neurology, Mareşal Çakmak Military Hospital, Erzurum, [3]Neurology, Gulhane Military Medical Academy, Ankara, Turkey

Objective: A few cases of severe headaches that develop during airplane travel (airplane headache) have been reported in the literature. But there has been no reported experience of such kind of headache in childhood.
Patients and methods: We followed-up two children (one female aged 11 and one male aged 13) who had been suffering from severe headache attacks resembling to migraine attacks during airplane landing. They were symptom-free during the daytime. Their physical and neurological examinations were all normal. Blood chemistries, cerebral magnetic resonance imaging, cerebral magnetic resonance imaging angiography were also normal. Paranasal sinus tomography showed bilateral maxillary sinusitis in the female patient and pansinusitis in the male patient.
Results: Both of the patients had become headache-free after antibiotic and anti-inflammatory treatment.
Conclusion: These two cases are the first cases that represent airplane headache in children.

P2470

A survey of febrile convulsion cases in the paediatric emergency room, Ghaem Hospital, Mashad, Iran

F. Hydarian
Mashhad University of Medical Science, Mashhad, Iran

Background: Febrile seizure is the most common neurological disorder in paediatrics and is an age dependent disease. In regard to its incidence, it is necessary to ascertain the important factors such as, age and sex distribution, family history, predisposing infectious factors, previous history of febrile seizures and the degree of fever.
Methods: This study was performed on patients who were admitted to paediatric, emergency room, Ghaem hospital during six months (20 March 2006 – 20 Sept 2006). Questionnaires were completed for 68 patients included in the study and data was analyzed with statistical measures including SPSS and Excel.
Findings: Most patients were male aged 1 to 3 years. There was a positive history of febrile seizure in about 25% of cases. The most common causes of febrile convulsion were rinopharyngitis and gastroenteritis. In 2/3 cases, there were simple febrile convulsions.
Results: Of 966 patients that were referred to emergency room, 68 cases had febrile convulsion (6.5%). It seems that children aged between 1 to 3 years especially male gender and cases with positive history of febrile convulsion should be looked after seriously during acute febrile disorders including respiratory and alimentary tract infections and with appropriate and immediate intervention for controlling fever, the febrile seizure can be prevented.

P2471

Sexuality in the difference – sexual aspects and sexual education in the young patient with spinal cord injury

A.V. Pereira, G.N. Pacheco Pinto Marques Jorge, A.M. Estevão
Faculdade de Medicina de Lisboa, Lisbon, Portugal

P2472

Clinical transformation of hyperkinetic syndromes at the stage of transition from childhood to adolescence

G. Bahtiyar Gafurov, R. Abdujamileva
Tashkent Institute for Advanced Training of Doctors, Tashkent, Uzbekistan

P2473

Neurophysiological analysis of the functional state of neuromotor apparatus in children with cerebral palsy during treatment with botulinum toxin A

G. Rakhimbaeva[1], S. Nurmatova[2], F. Khamraev[2]
[1]Medical Academy, [2]The Republic Psycho Neurological Hospital, Tashkent, Uzbekistan

P2474

Developmental changes of P2Y receptor expression in rat DRGs

M. Nigmetzyanova
Histology, Cytology, Embryology, Kazan State Medical University, Kazan, Russia

P2475

Carbamazepine as an alternative treatment in children with attention deficit hyperactivity disorder (ADHD)

S. Bakhtadze[1], N. Khachapuridze[2], N. Geladze[2]
[1]Clinical Neurology, Tbilisi State Medical University, [2]Pediatric Neurology, Tbilisi State Medical University, Tbilisi, Georgia

P2476

Abstract cancelled

P2477

Cerebral palsy in children in the Republic of Moldova

T. Cucu, A. Nacu, A. Siric
Child Rehabilitation Center, Chisinau, Moldova

P2478

The surgical algorithm for management of children with cervical spine abnormalities

A. Gubin, E. Ulrich
Saint-Petersburg State Pediatric Medical Academy, Saint Petersburg, Russia

P2479

Clinical presentation of CNS diseases associated with cytomegalovirus and herpes simplex virus type 2 infection in new-born children and infants

Z. Idrissova[1], A. Sasanova[2]
[1]Neurology, Kazakh National Medical University, [2]Child Neurology, Republican Clinical Child Hospital, Almaty, Kazakhstan

P2480

The ketogenic diet prior to time of Jesus till the era of Hollywood

A.A. Mahmoud
Pediatric Neurology, K.F.M.C., Riyadh, Saudi Arabia

P2481

Pilocytic astrocytoma in childhood age: a case report

V. Stojanovska[1], V. Mircevski[2], D. Ilijevski[2]
[1]Private Medical Institution "Celzus - Pro", [2]Clinical Centre Skopje, Skopje, FYR Macedonia

Muscle and neuromuscular junction diseases

P2482

Dominant-negative effects of a novel mutation in the filamin myopathy

S. Kono[1], T. Nishio[2], Y. Takahashi[3], N. Goto-Inoue[4], M. Kinoshita[5], N. Zaima[4], H. Suzuki[1], A. Fukutoku-Otsuji[6], M. Setou[4], H. Miyajima[1]
[1]First Department of Medicine, [2]Department of Laboratory Medicine, Hamamatsu University School of Medicine, [3]Department of Internal Medicine, Enshu Hospital, Hamamatsu, [4]Department of Molecular Anatomy, [5]Department of Pathology, Hamamatsu University School of Medicine, [6]Department of Neurology, National Hospital Organization Tenryu Hospital, Hamamatsu, Japan

Background: Filamin myopathy is associated with mutations in the filamin C gene (FLNC) and is a myofibrillar myopathy characterized by focal myofibrillar destruction and cytoplasmic aggregates containing several Z-disk-related proteins.
Methods: This study investigated 6 Japanese patients with dominantly inherited myofibrillar myopathy manifested by adult-onset, slow and progressive muscle weakness and atrophy in the distal extremities.
Results: The abundantly expressed proteins in the affected muscles were identified as filamin C by nano liquid chromatography-tandem mass spectrometry. A genetic analysis of FLNC identified a heterozygous c.8107delG mutation that was localized to the dimerization domain of filamin C. A biochemical cross-linking analysis of bacterially-expressed recombinant wild-type and mutant filamin C fragments demonstrated that the mutant monomer disturbed the proper dimerization of the wild-type filamin dimer, resulting in formation of a heterotrimer with the wild-type filamin dimer. The expression study in C2C12 myoblasts showed that the mutant filamin fragments formed cytoplasmic aggregates with endogenous wild-type filamin C.
Conclusions: This study provides evidence for the dominant-negative effects of the FLNC mutation. These effects may be mutation-specific and likely result in the variation in the clinical phenotypes seen in the patients with filamin myopathy.

P2483

The Warsaw registry of myasthenia gravis patients

A. Kostera-Pruszczyk, M. Lipowska, B. Szyluk, B. Ryniewicz, P. Szczudlik, H. Kwiecinski
Neurology, Medical University of Warsaw, Poland

Myasthenia gravis (MG) is a rare autoimmune disease. Since May 1st, 2009 we started registering clinical and socioeconomic data from patients with MG seen at our department and outpatient clinic, and biobank of patients' sera and DNA, collected after informed consent, as approved by our University Ethics Committee. Until 30.01.2010, 195 patients aged 3-82y were enrolled in the registry, 66% were women. Women were significantly younger than men at onset of MG (mean age 32.8 y.o. vs. 53 y.o., $p<0.0001$). Median time to diagnosis was 6 months. 80.5% of the patients were seropositive for antiacetylcholinesterase receptor antibodies. 2.5% of the patients had antiMuSK antibodies. 12 seropositive cases were familial, including a pair of identical twins. Median duration of MG was 6 years. 39 patients had ocular onset of disease; the median time to generalization of MG was 4 months. 4 patients presented with myasthenic crisis. Myasthenia Gravis Foundation of America clinical classification was used to evaluate clinical status. At the nadir of MG 15% of the patients were in class I (ocular), 5% experienced myasthenic crisis (class V). 91 patients underwent thymectomy, at the mean age of 29.8y. Thymoma were diagnosed in 10% of them. 93% of patients were treated with acetylocholinesterase inhibitors, 60% with oral corticosteroids, 30% with azathioprine, 7% with cyclophosphamide, 6% did not require treatment. 95% of patients improved, only 3.5% worsened during follow-up. Our single centre database will provide comprehensive characteristics of MG patients linked to the biobank, valuable for MG research.
Study supported by Polish-Norwegian Research Fund

P2484

Outcome measures validation study for mesoangioblasts transplantation in children affected by Duchenne Muscular Dystrophy

S. Bonfiglio[1], A. Lerario[1], A. Tettamanti[2], S. Marktel[2], S. Napolitano[2], S. Previtali[2], M. Scarlato[2], M.G. Natali-Sora[2], N. Bresolin[1], G. Comi[2], R. Gatti[2], F. Ciceri[2], G. Cossu[2], Y. Torrente[1], AIM Group for DMD
[1]Department of Neurological Science, Centro Dino Ferrari, University of Milan, Fondazione IRCCS Policlinico Mangiagalli Regina Elena, [2]San Raffaele Scientific Institute, Milan, Italy

The aim of this study is to establish a reliable tool of reproducible assessment of muscle strength in children affected by Duchenne muscular dystrophy (DMD) which will be selected for mesoangioblasts transplantation. We have developed a potential treatment for DMD based on infusion of cells from a healthy capable donor. This is a single centre, prospective, non-randomised study of validation of outcome measures on 30 ambulant patients aged 5 to 12 years affected by DMD including a cohort of 15 healthy aged-matched males. We perform two days evaluation every three months for one year. During each assessment the following outcome measures are applied to DMD subjects: North Star Scale and 6 minute walking test during the first day; quantitative assessment using the Kin Com 125 machine during the second day. The control subjects will perform quantitative assessment twice in a year. We divided the patients into 3 subgroups of age (5-7 years, 8-9 years, 10-12 years). The results of this preliminary part of the study show specific correlation between functional and quantitative tests in stronger children. Kin Com measurements correlate appropriately with functional tests for 10-12 year-old DMD boys, but show a major variability in muscle strength for 8-9 year-old DMD boys. This preliminary study demonstrates that our assessment may represent a useful tool to monitor the progress of DMD in ambulant children to determine the pre-transplantation story of the children who will be later treated with mesoangioblasts.

P2485

Late onset myasthenia gravis – clinical review of 21 patients

R. Felgueiras[1], E. Coutinho[1], A.M. Silva[1], E. Santos[1], M.I. Leite[2]
[1]Neurology, Hospital Santo António, Centro Hospitalar do Porto, Porto, Portugal, [2]Neurosciences Group, Institute of Molecular Medicine, and Department of Clinical Neurology, John Radcliffe Hospital, University of Oxford, Oxford, UK

Background: Incidence rates of MG in the elderly have been increasing, probably more than expected for the global population aging and more accurate diagnosis. Although similar to young onset MG, LOMG may have specific characteristics that need to be highlighted to improve diagnosis and patient management.
Objective: To review the clinical characteristics of LOMG, looking at presentation, difficulty in diagnosis, severity, response to treatments, and outcome.
Methods: Retrospective review of 21 patients (MG onset age >50 years) followed-up in neuroimmunology outpatient clinic of a Portuguese tertiary referral hospital.
Results: 21 out of 96 of MG patients (21.8%) have LOMG. 12 females (57%); mean age at MG onset was 66.7 years (50-81). 7 patients (33%) had diagnosis delayed by more than a year. 8 patients (38%) were in class I, 4 (19%) in class IIa, and 9 (42.9%) in class IIb (MGFA classification). Antibodies to acetylcholine receptor were positive in 9 (42.9%) patients. 21 patients were given pyridostigmine, and 16 (76%) steroids ± immunosuppression. 4 patients (19%) received intravenous immunoglobulin. 9 patients had thymoma on imaging, and 6 were thymectomised. With a mean follow-up of 9 years, 8 patients (40%) were in remission, 9 (45%) were still symptomatic and 3 (15%) died of unrelated diseases.
Conclusion: LOMG can be difficult to diagnose. The high proportion of patients on steroids may mean a bias towards the diagnosis of more severe cases. LOMG may be underdiagnosed, particularly in males (usually males predominate in this group) because of concomitant conditions or mild MG symptoms.

P2486

Diagnostic value of dystrophin immunostaining in females with asymmetric myopathy and muscle cramps

T.-H. Chen[1,2], W.-T. Huang[3], W.-T. Chen[3], T.-J. Hsieh[4], S.-N. Yang[1,2], Y.-J. Jong[1,2]
[1]Department of Pediatrics, [2]Graduate Institute of Medicine, College of Medicine, [3]Department of Pathology, [4]Department of Medical Imaging, Kaohsiung Medical University Hospital, Kaohsiung, Taiwan R.O.C.

Objective: Duchenne muscular dystrophy (DMD), an X-linked recessive disorder, affects 1 in 3,300 males worldwide. Approximately 8% of DMD carriers are symptomatic, who could manifest asymmetric weakness, calf hypertrophy, cardiac involvements and hyperCKemia. We weighted the diagnostic value of dystrophin immunostaining of biopsied muscles in differentiating symptomatic DMD carriers from females presenting with asymmetric myopathy and muscle cramps.
Methods: From 1983 to 2009, we followed a cohort of female patients with asymmetric weakness and frequent muscle cramps. All received muscle biopsy prepared for routine histochemical and dystrophin immunostaining. Blood creatinine kinase, cardiac examinations, muscular computed tomography (CT) and gene testing were preformed.
Results: 6 females 13 to 48 years old, whose onset of weakness ranged from 1-10 years, were enrolled. All patients had hyperCKemia (1,775 -5,000 IU/L). Muscle CT revealed asymmetric atrophy in all patients and calf hypertrophy in 3. 3 had a mosaic pattern of dystrophin immunostaining in muscle biopsies, whom were subsequently diagnosed DMD carriers by dystrophin gene analysis showing sporadic point mutations. The remaining 1 patient had multiple acyl-CoA dehydrogenase deficiency and two had polymyositis. 1 DMD carrier had atrial fibrillation and dilated cardiomyopathy.
Conclusions: The differential diagnosis for females with hyperCKemia, asymmetric myopathy, and easy muscle cramps should include DMD carrier. Similar to DMD patients, symptomatic carriers are also at high risk of developing dilated cardiomyopathy. Early detection of symptomatic carriers, especially for those without a DMD family history, by muscle immunostaining combining with gene testing warrants an early cardiac surveillance in these patients.

P2487

Enzyme replacement therapy induces enzyme-specific T-cell responses in Pompe's disease

M. Banati, Z. Hosszu, A. Trauninger, L. Szereday, Z. Illes
University of Pecs, Hungary

Introduction: The deficiency of acid alpha-glucosidase in ultra-orphan Pompe's disease (PD) can be treated by infusions of the recombinant enzyme (rhGAA). Replacement therapy (ERT) generates anti-rhGAA IgG-antibodies, which may interfere with efficacy. Here, we examined if ERT also induces rhGAA-specific T-cell responses.
Methods: 7 Hungarian patients with late-onset PD (6 with ERT, 1 untreated) and 5 healthy controls were examined. The ex vivo frequency, intracellular perforin, surface FasL, CD25, CD69, CTLA-4 expression of T-cells subsets, Tregs and NK cells were examined by flow cytometry. Peripheral blood mononuclear cells and isolated CD4+ and CD8+ T-cells in the presence of antigen presenting cells were stimulated with rhGAA (1 and 10μg/ml) for 48 hours in vitro. Intracellular IFN-γ expression and Th1, Th2, Th17 cytokine production of such cultures were measured by cytometric bead array (CBA). Activation markers were also examined.
Results: All treated patients had an IgG antibody response against rhGAA. After rhGAA stimulation in vitro, a dose-dependent increase of pro-inflammatory intracellular IFN-γ expression in CD8+ ($p<0.01$) and CD4+ T-cells ($p<0.05$) was observed in the treated patients in contrast to the untreated patient and healthy subjects. The production of antigen-specific IL-10, IL-17 and TNF-α and increased expression of intracellular perforin by isolated CD8+ T-cells were also detected ($p<0.05$).
Conclusion: In addition to the antibody response, ERT also induced cytotoxic and inflammatory T-cell responses, which may also influence treatment efficacy.

P2488

Two-year treatment with cyclosporine microemulsion for responder MG patients

Y. Nagane[1], S. Suzuki[2], N. Suzuki[2], K. Utsugisawa[1], Keio-Hanamaki MG Study Group
[1]Department of Neurology, Hanamaki General Hospital, Hanamaki, [2]Department of Neurology, Keio University School of Medicine, Tokyo, Japan

Background and aims: Among patients with myasthenia gravis (MG), a relatively high percentage (>30%) respond poorly to calcineurin inhibitors (CNIs: cyclosporine and tacrolimus). We conducted an open trial to examine the efficacy and safety of long-term cyclosporine microemulsion pre-concentrate (CsA MEPC) in MG patients excluding poor responders.
Patients and methods: Among 28 MG patients initially included, 9 (32.1%) were defined as poor responders at 6 months after starting CsA MEPC, and these were excluded from longer-term CsA MEPC therapy. The remaining 19 responders were enrolled in an unblinded, 2-year prospective open trial.
Results: Two-year CsA MEPC therapy had severity-suppressing (mean MG Foundation of America (MGFA) quantitative MG score, 9.4 before to 5.3 after; $p<0.005$) and steroid-sparing (mean prednisolone dose, 11.2mg/day before to 3.5mg/day after; $p<0.01$) effects in the responders. The proportion of patients with minimal manifestations or pharmacologic remission (MGFA post-intervention status) increased from 10.5% to 73.7% ($p<0.001$). Body mass index decreased significantly, and 9 of 12 patients complaining of "moon face" reported that this resolved. No patients showed significant side effects and no cases of cancer were detected during the 2-year treatment period.
Conclusions: CsA MEPC therapy is beneficial and safe for responder MG patients.

P2489

The analysis of corrected QT interval in patients with myotonic dystrophy type 1

K.J. Shin
Neurology, Hanmaeum Hospital, Jeju, Republic of Korea

Sudden cardiac arrest is one of the leading causes of death in patients with myotonic dystrophy type 1 (DM1). It has been proposed that prolonged QT interval is associated with sudden cardiac death in several diseases. The purposes of this study are 1) to determine the association between the QT interval and DM1 and 2) to analyze the factors affecting QT interval in patients with DM1. 68 patients diagnosed with DM1 through genetic test were included in this study. Age, sex, age of onset, disease duration, associated diseases, ECG findings, CTG repeat sizes and the QTc interval (corrected QT interval calculated by Bazett's formula, $QTc=QT\sqrt{RR33}$) of 68 patients were assessed. The QTc intervals of 68 patients and 68 normal sex-age matched healthy controls were compared. The clinical and laboratory factors affecting the QTc interval in patients group were investigated. The QTc interval of DM1 group (413.8±45.3 msec) was significantly higher than normal control group (355.6±20.6msec). 13 among the 68 DM1 patients showed abnormal prolonged QTc interval. Female sex, abnormal EKG findings, disease duration and age were significantly associated with prolonged QTc interval in the patient group. The advantages of QTc interval in assessing the cardiovascular autonomic nervous system (ANS) are its safety, simplicity, cost-effectiveness and reproducibility. Therefore, the QTc interval can be used as a good screening test in assessing the cardiovascular ANS in patients with DM1.

P2490

Clinical improvement of Dok-7 congenital myasthenia patients with oral salbutamol

J. Moreira Martins, L.N. Santos
Neurology, Hospital de Egas Moniz – CHLO, Lisboa, Portugal

Introduction: Specific diagnosis of Congenital Myasthenic Syndromes (CMS) is essential as some medications may treat one type but be deleterious in another. Ephedrine and salbutamol have shown benefit in Dok-7 subtype.
Clinical cases: 2 siblings (female 51 and male 37) from a kindred of 8 initiated slowly progressive proximal lower limb weakness in their early teens. The woman had far more grave presentation with facial, pharyngeal, tongue and neck weaknesses, bilateral lid ptosis without ophthalmoplegia, mild respiratory insufficiency and a severe mainly proximal tetraparesis requiring wheelchair since her early twenties. Piridostigmine, corticosteroids and plasmapheresis were tried but no improvement was noticed. The man had a more benign presentation with only moderate proximal tetraparesis, mild left ptosis and minimal facial weakness. 1124_1127dupTGCC homozygous frameshift Dok-7mutation was detected in her, and oral salbutamol initiated in both (2mg twice/day, escalating from here). The man improved very much, with almost complete remission of weakness, being now able to perform normal life. The woman noticed marked improvement of her ptosis, dysarthria, facial, pharyngeal and neck weaknesses; she is now able to walk unassisted, dress and undress alone, and even do some house cleaning. Mild tension headache and insomnia are her rare complaints and hypertension was detected in him after treatment.
Discussion/conclusions: The authors would like to highlight the dramatic clinical improvement noticed in these two siblings shortly after oral salbutamol therapy. Recognizing the treatable Dok-7 CMS subtype as a cause for LGMD phenotype is also of paramount importance, and more clinicians should be able to do so.

P2491

Compromised neuromuscular transmission in collagen XIII knockout mice

N. Naumenko[1,2], A. Shakirzyanova[2,3], A. Latvanlehto[4,5,6], T. Pihlajaniemi[4,5,6], R. Giniatullin[2]
[1]Kazan State Medical University, Kazan, Russia, [2]Neurobiology, A.I. Virtanen Institute for Molecular Sciences UEF, Kuopio, Finland, [3]Biophysics of Synaptic Processes Lab, Kazan Institute of Biochemistry and Biophysics Kazan Scientific Center Russian Academy of Sciences, Kazan, Russia, [4]Oulu Center for Cell-Matrix Research, [5]Biocenter Oulu, [6]Department of Medical Biochemistry and Molecular Biology, Oulu, Finland

Collagen XIII located at the neuromuscular junctions (NMJs) may be a muscle-derived factor of synaptic plasticity. Using intracellular microelectrode technique we studied NMJs functioning in acutely isolated diaphragm muscles of Col13a1-/- mice lacking collagen XIII. This line was generated in the Biocenter of Oulu under supervision of Prof. T. Pihlajaniemi. We show that the amplitude of miniature end-plate potentials (MEPP) in Col13a1-/- mice was reduced indicating lower quantal size. MEPPs frequency was dramatically depressed suggesting a low probability of spontaneous quantal acetylcholine (ACh) release. The sucrose-induced enhancement of ACh release was considerably reduced suggesting a small pool of readily releasable vesicles. Consistent with this, in Col13a1-/- mice, high potassium induced much less quantal secretion. Interestingly, individual postsynaptic end-plate potentials (EPPs) elicited by motor nerve stimulation were only slightly reduced. However, paired-pulse stimulation (interval 30 ms) induced depression in Col13a1-/- mice instead of facilitation observed with the same protocol in the wild type animals. These data indicate dominating presynaptic dysfunction in Col13a1-/- mice. Our results show the great role of collagen XIII in the normal structure and function of vertebrate NMJs. Loss of collagen XIII or the presence of antibodies to it considerably defect neurotransmission and thus could contribute to myasthenic disorders.

P2492

A pilot study to evaluate current practices of transition of young adults from paediatric to adult neuromuscular (NM) clinics

F. Rotimi[1], A.-M. Childs[2], B. Potrata[3]
[1]Paediatric Department, [2]Department of Paediatric Neurology, Leeds General Infirmary, [3]Nuffield Institute of Health Research, University of Leeds, Leeds, UK

Background: New developments in medical management of chronic diseases in childhood have led to higher life expectancy and survival into adulthood as more children are transferred to adult services. Transition of healthcare from children to adult services has been a topical issue over the last 15 to 20 years.
Aims of this study: To review current practice of Leeds paediatric neuromuscular team against Department of Health (DOH) guidelines on transition, identify key needs for NM patients, identify unmet needs and look at the role of clinic to inform future improvements in care pathway.
Methods: Young adults attending the regional NM clinic from 2004-2009 between 16-25yrs were invited to take part in the study. Questionnaires were sent to 71 young adults and their families. Results were analysed against the DOH guidelines. Two focus group sessions were held to obtain views of 15-25 year olds.
Results: 21 responses were received from the young adults and 17 from carers. Key themes noted from the questionnaires and focus group sessions were inadequate information resource, preference for age of transition at 18 years and longer duration of attendance at transition clinic. Provision of a specific young adult neuromuscular clinic was welcomed by all participants. Access to information on adult services and an identified key-worker were paramount to help meeting needs in an adult health care.
Conclusions: 18 years was the ideal age for transfer to occur by study participants. Current transition practice is perceived to be abrupt, but should be more gradual.

P2493

Genotype-phenotype correlations of KCNJ2 mutations in 6 Polish patients with Andersen-Tawil syndrome

A. Kostera-Pruszczyk[1], M. Lipowska[1], P. Bienias[2], P. Pruszczyk[2], L. Ptacek[3], H. Kwiecinski[1]
[1]Neurology, [2]Internal Medicine and Cardiology, Medical University of Warsaw, Warsaw, Poland, [3]Neurology, University of California San Francisco, CA, USA

Andersen-Tawil (ATS) syndrome is a rare muscle channelopathy, manifesting as dysmorphic features, periodic paralysis and ventricular arrhythmias. We report 6 patients from 4 Polish families with ATS confirmed by genetic testing. Three different mutations of KCNJ2, encoding the human inward rectifying potassium channel Kir 2.1, were identified; two mutations were not previously reported. Probands (2 girls and 2 boys, aged 7-16) were referred to our department because of episodic weakness. All patients presented with dysmorphic features: hypertelorism in 6, small hypoplastic mandible in 5, clindactyly or syndactyly in 4 patients, short stature in 1. 5 of 6 patients had a history of normokaliemic periodic paralysis. Muscle weakness lasted from several minutes to two weeks. No triggering factors could be identified. The patients became symptomatic between 13 months of age and adulthood. None had spontaneous resting activity in EMG. Only 2 patients had a history of symptomatic arrhythmias. Long QT interval or abnormal U-waves were observed in ECG in 4 patients. Severe ventricular arrhythmia was documented with Holter ECG in 3 patients. They were referred for ICD implantation. A severe phenotype with cardiac arrhythmia recorded in utero was observed in a sporadic case with E138K mutation. Two families (3 patients) carried a G146R mutation, and one family (2 patients) a P186L mutation. In addition 2 patients diagnosed with ATS phenotype did not show KCNJ2 mutations.
Conclusion: We confirm that in 75% of cases the ATS phenotype is caused by the KCNJ2 mutations. Clinical severity varies between patients carrying the same mutation.

P2494

Role of TNF-alpha levels on critical illness myopathy in a septic rat model and the effect of Anti-TNF alpha treatment on critical illness myopathy treatment

A. Eker[1], E. Tan[1], S. Erdem Özdamar[1], E. Bodur[2], C.M. Temucın[1], G. Sayat[3]
[1]Neurology, [2]Biochemistry, [3]Neuroimmunology, Hacettepe University, Ankara, Turkey

Critical illness and neuromuscular complications are frequently observed among the patients who have been followed in intensive care unit more than one week. Critical illness myopathy is characterized with generalised, respiratory muscles weakness and accompanied with difficulty of weaning from mechanical ventilation. The most important risk factor is sepsis. Despite of various researches for early diagnosis there is no effective treatment for this disease. During sepsis, TNF alpha causes muscle breakdown by triggering ubiquitin system, also influences muscle excitability. This knowledge has led us to think that TNF alpha might be the critical molecule for critical illness myopathy. Critical illness myopathy has been searched with septic rats. Sepsis was induced by intraperitoneal lipopolysaccarid (LPS-E.Coli) injection. TNF alpha levels were measured in serum and muscle at 2nd hour in both LPS injected and saline injected rats. At 0th and 48th hours myopathic changes were investigated with EMG. At the day 6 after LPS injection, muscle biopsies were taken for histopathologic diagnosis and grading. These findings compared with 2nd hour TNF alpha levels. Afterwards TNF alpha inhibiting agents 'soluble TNF R1' or pentoxyphillin were given to different groups previously sepsis induction. Their preventive effect on TNF alpha induction and myopathy occurrence searched by comparing control groups. Our results will be discussed by the light of the previous literature. Neuromuscular disorders that are related with critical illness are serious morbidity reasons. Here we thought that modulation of triggered immune system during critical illness may be the target of treatment of critical illness myopathy.

P2495

One or two diseases? The phenotypical expression of G13513A mutation in mitochondrial DNA

D. Neutel, M. Coelho, C. Barroso, T. Evangelista
Hospital Santa Maria, Lisbon, Portugal

Background: Mitochondrial encephalomyopathy with lactic acidosis and stroke-like episodes (MELAS) is a genetically heterogeneous disorder, which most frequent mutation is A3243G. Leber's hereditary optic neuropathy (LHON) is also a mitochondrial disorder that affects only the optic nerve. The G13513A mutation in mitochondrial DNA (mtDNA) has been less frequently associated with MELAS, and it was also reported in a male patient with an overlap syndrome of MELAS/LHON.
Case-report: A 32-year-old woman was consulted for painless loss of central vision in both eyes simultaneously over the course of a few days. She complained of progressive bilateral hearing loss since childhood, bilateral cataract since she was 14 and episodes of severe headache with nausea and photophobia since 16. Her mother had died with diagnosis of MELAS, but no mutation was identified . The patient was of small stature . Her visual acuity was 1/10 in both eyes, optic disks were pale, and she also had a pigmentary retinopathy. Her gait was ataxic. MRI showed a severe-moderate cerebellar atrophy, diffuse hyperintensities of both cerebral hemispheres and middle cerebellar peduncles white matter, multiple lacunas, enlargement of fourth ventricle. Muscle biopsy was unremarkable. Muscle mtDNA analysis identified the G13513A point mutation in ND5 gene in heteroplasmy .
Discussion: Our patient carries mtDNA G13513A mutation expressing as a MELAS plus a bilateral optic neuritis of rapid onset. As only exceptionally present in MELAS, this bilateral optic neuritis probably represents LHON manifestation, which raises the possibility that G13513A mutation may present as both phenotypes of MELAS and LHON.

P2496

Long-term treatment of a cohort of five patients with multifocal motor neuropathy with subcutaneous immunoglobulin 16%: clinical and practical observations

D. Gosal, A. Woodall, J. Sussman, D. Gow
[1]*Neuromuscular Department, Greater Manchester Neuroscience Centre, Salford, UK*

Objectives: The current recommended treatment for multifocal motor neuropathy (MMN) is intravenous immunoglobulin (IVIg). We report the objective assessment of five adults with MMN who were switched from IVIg to home-based subcutaneous Ig (SCIg) 16%.
Methods: Before switching to SCIg, patients aged 32 to 60 yr, had received IVIg for periods of 3.3 yr (90g/4 wk) [Pt1]; 12.5 yr (96g/4 wk) [Pt2]; 10 yr (40g/3 wk) [Pt3]; 5 yr (25g/6 wk) [Pt4]; and 2 yr (120g/4 wk) [Pt5]. Reasons for switching included inconvenience of IV treatment and pulmonary embolus after IVIg. Objective measures included: grip strength (GS) and time to complete a 9-hole peg test (PT) with the right (RH) and left hands (LH); time to complete a 50 m walk; and quality-of-life score (SF-12 questionnaire).
Results: Patients have received SCIg for between 6 and 18 months. In four patients, GS was unchanged or improved by 0-80% (RH) and 3-67% (LH), compared with baseline, and worsened in one patient. Compared with baseline, PT improved by 11-75% (RH) and 17-28% (LH) in four patients, and was unchanged/worse in one patient. Walk time improved in three patients by 6-21%. SF-12 evaluations are ongoing and will be reported.
Conclusions: SCIg self-administered at home was an effective alternative to IVIg in four of five patients. In our experience, if patients with MMN are not stable on IVIg they may not benefit from a switch to SCIg.

P2497

Clinical features of thymomatous myasthenia gravis

K.H. Chan, J.W.H. Tsang, H.H.W. Liu, P.W.L. Ho, A.C.Y. Chu
University of Hong Kong, Hong Kong, Hong Kong S.A.R.

Background: MG is an autoimmune disorder targeting skeletal muscle acetylcholine receptor. Thymoma are associated in some MG patients.
Aim: Study clinical and serological characteristics of Chinese thymomatous MG patients.
Methods: MG patients with thymomectomy and histologically confirmed thymoma followed up in our hospital for at least 12 months were studied.
Results: Total 37 Chinese MG patients with histology-proven thymoma were retrospectively studied. The mean MG symptom onset age was 48.5 years (range 25-81), 25 (68%) were female. The mean follow-up duration was 4.9 years (range1-15). MG symptoms preceded detection of thymoma in the majority (31 patients, 84%), in 6 patients thymoma detection preceded MG symptoms onset by 1-8 years. 19 patients (51%) had early onset MG (before 50 years of age). All patients were seropositive for acetylcholine receptor antibodies and 30 patients (81%) seropositive for striated muscle antibodies. Eleven patients (30%) had experienced myasthenic crisis and the worst MGFA clinical severity grade were class I (6 patients), class II (3), class III (8), class IV (9) and class V (11); hence 31 (84%) had generalized MG and 6 (16%) had ocular MG. 27 patients (73%) had history of corticosteroid therapy, 22 (60%) require azathioprine, 2 require other immunosuppressant (1 mycophenolate mofetil, 1 cyclosporin A). All 37 patients had good or satisfactory MG clinical outcome measured by MGFA post-intervention status (2 pharmacological remission, 23 minimal manifestation, 12 improved).
Conclusion: Thymoma MG was clinically severe with frequent myasthenic crises, but response to conventional immunosuppressive therapies is satisfactory.

P2498

Glycogen storage disease type IIIa presenting with proximal muscle weakness and asymptomatic ketotic hypoglycaemia

A.M. Schneider[1], R. Topakian[1], I. Ciovica[1], S. Weiss[2], F.T. Aichner[1]
[1]Neurology, [2]Pathology, Academic Teaching Hospital Wagner-Jauregg, Linz, Austria

Introduction: Glycogen storage disease type III (GSD-III) is a rare autosomal recessive disorder caused by the lack of amylo-1,6-glucosidase (AGL), one of the catalytic domains of the glycogen debranching enzyme. Deficiency of this enzyme classically results in hepatomegaly, ketotic hypoglycaemia, hyperlipidaemia, and increased creatine kinase levels. Generally, disease onset occurs early, starting from the first year of life. Diagnosis of the disorder is usually confirmed in childhood by liver biopsy demonstrating abnormal liver glycogen content and absent enzyme activity.
Case report: A 46-year-old woman presented with increasing exercise intolerance and slowly progressive muscle weakness. Neurological examination revealed diffuse muscle hypotrophy and a mild symmetrical upper and lower limb girdle weakness. Electromyography showed a mild axonal neuropathy and a myopathic pattern. Hepatomegaly was known since childhood, but a liver biopsy had not been performed. There was no cardiomyopathy. Liver enzymes and creatine kinase levels were both elevated, but lactate tests were normal. During hospital stay, there was a single episode of asymptomatic hypoglycaemia associated with mild ketonuria. Muscle biopsy demonstrated PAS-positive vacuoles containing glycogen. Genetic analysis detected two heterozygote mutations in the AGL gene confirming GSD-III.
Conclusion: Diagnosis of rare metabolic diseases may be delayed and patients may present to adult neurologists, especially when neuromuscular symptoms are mild in childhood and progress with time. Neuromuscular symptoms and signs in patients with GSD-III may be "static" (atrophy) as well as "dynamic" (exercise intolerance).

P2499

Calpain-3 deficiency: an emerging cause of limb girdle muscular dystrophy

A. Vontzalidis[1], G. Papadimas[1], C. Papadopoulos[1], K. Spengos[1], G. Terzis[1,2], P. Manta[1]
[1]Department of Neurology, University of Athens, Eginition Hospital, [2]Department of Laboratory of Track and Field, School of Physical Education and Sport Science, University of Athens, Greece

Introduction: Calpain-3 is a muscle specific calcium dependent protease with many physiological roles, such as myogenesis and sarcomeric remodelling. A defect in calpain-3 expression results in the recessively inherited limb girdle muscular dystrophy 2A (LGMD2A) with three main clinical phenotypes: the most frequent pelvifemoral (Leyden Möbius), the scapulohumeral (Erb) and rarely an isolated creatine kinase (CK) elevation.
Methods: Seventeen patients with confirmed calpain-3 deficiency either genetically or on immunoblot have been clinically examined. They have also been submitted to muscle biopsy, electrophysiological evaluation and a thorough laboratory investigation.
Results: The onset of the disease varied between 5 and 53 years of age. Most patients presented with proximal muscle weakness of the pelvic girdle and lower extremities, while shoulder girdle musculature had been subsequently involved in 11 patients. One patient presented with mild proximal weakness of the upper extremities resembling Erb phenotype, while another had only asymptomatic hyperCKemia. CK levels were moderately and occasionally much increased in all the patients. Only three patients were severely affected, while the rest had mild to moderate symmetrical weakness.
Conclusion: Calpainopathies seem to be quiet frequent among the limb girdle muscular dystrophies in Greek population. Most patients presented with proximal muscle weakness of the lower extremities and hyperCKemia. Since the course of LGMD2A is usually slowly but relentlessly progressive, it is imperative to timely reach the diagnosis especially in the light of the possible prenatal detection of the disease.

P2500

Calpainopathies (LGMD2A) and pregnancy

C.M. Mignard-Moy de Lacroix[1], D.A. Mignard[2]
[1]Neurological Rare Diseases Department, CHR de la Reunion, [2]SCP de Neurologie, Saint Pierre de la Reunion, France

Background: Calpainopathies (LGMD2A) are limb girdle muscular dystrophy affecting young adults. Disease progression is generally slow and planning a pregnancy in young patients is a difficult issue; they want to live a normal life and do not give up having children, even at the expense of their muscle strength.
Study Design: No specific study has ever been carried out in this field. In order to determine whether pregnancy was a deteriorating factor, we collected the experience of all of our LGMD2A patients who conducted one or more pregnancies after being diagnosed
Materials and methods: A questionnaire on the condition of the patient before, during and after pregnancy, conditions of delivery, state of the newborn and its management, has been distributed to all patients with calpainopathy.
7 patients, aged between 18 and 38 years completed the questionnaire (1 per pregnancy) and thus 11 questionnaires were used: 10 were desired pregnancies; 6 patients had had access to genetic counselling and were warned of possible effects of their illness on pregnancy and vice-versa.
Results: The results before, during and after pregnancy were compared. The conditions of delivery, baby´s condition at birth, capacity of baby care were analysed.
Conclusion: Pregnancy does not impact the condition of the patient dramatically. The pregnancy is not aggravated by the disease either. The clearest impact of the disease concerns the conditions of delivery (induced labour, caesarean section) and the capacity of caring the baby after birth.

P2501

Mutations in A/C Lamins with muscular dystrophy and heart conduction defects

M. Rodrigues[1], E. Vieira[2], R. Santos[2], M. Santos[3]
[1]Braga Hospital, Braga, [2]Unidade de Genética Molecular, Instituto de Genética Médica Jacinto Magalhães, [3]Neuromuscular Diseases Clinic, Pediatric Neurology, Centro Hospitalar do Porto, Portugal

Background: 16 distinct phenotypes have been described with LMNA mutations (encodes for Lamins), amongst which are Emery Dreyfuss muscular dystrophy type 2, limb girdle muscular dystrophy (LGMD1B), AR- CMT2A neuropathy, familial partial lipodystrophy, cardiomyopathy with conduction defect and progeric syndromes. Recently, a congenital form of muscular dystrophy with rigid spine has been described. Many overlap syndromes exist, with variable combinations of muscular, cardiac and lipodystrophic changes.
Clinical pictures: 4 patients from three different families are described. They present different combinations of myopathic syndrome, cardiac rhythm changes and lipodystrophy, in whom a LMNA mutation was identified. 3 patients presented as Emery Dreyfuss and one as congenital muscular dystrophy with rigid spine. They all present tendinous retractions in variable degrees, predominantly at the rachis. 2 of the patients are siblings, and the same mutation was found in their mother who has no clinical changes. The symptoms appeared between 11 months and 5 years. Only 1 patient remains ambulatory after 21 years of disease, in the remaining loss of walking ability occurred between 2 and 18 years. All patients have cardiac conduction defects and 1 has associated cardiomyopathy. In all patients ventilatory support was needed. 2 patients developed lipodystrophy.
Conclusion: Laminopathies are likely underdiagnosed, and despite their clinical heterogeneity, molecular diagnosis is fulcral in patients with myopathy and tendinous retractions, particularly rigid spine, regardless of the age. The risk of associated conduction defects requires surveillance and frequently the use of implantable cardioverter defibrillators.

P2502

Involvement of the neurotrypsin-agrin axis in sarcopenia

J. Vrijbloed[1], S. Hettwer[1], P. Dahinden[1], S. Kucsera[1], R. Fariello[2]
[1]Neurotune, Schlieren, [2]Neurotune, Bioggio, Switzerland

The extracellular proteoglycan agrin is essential for the formation and stabilization of neuromuscular junctions (NMJs). Agrin is cleaved by the synaptic protease neurotrypsin at two sites thereby losing its NMJ stabilizing function. Expression of neurotrypsin in mice leads to a sarcopenia-phenotype with behavioural and histo-pathological features closely resembling those of sarcopenia. Cleavage of agrin by neurotrypsin releases a soluble 22 kDa C-terminal fragment (CAF) which can be detected in blood and it is absent in neurotrypsin KO mice. Elevated levels of CAF are indicative of increased neurotrypsin activity. Sarcopenia is often diagnosed by dual energy X-ray absorptiometry (DXA). To ascertain a possible link between clinically evident sarcopenia and neurotrypsin activity, we measured CAF serum levels in 75 patients of both sexes older than 65 years recruited from geriatric specialty hospitals. Anthropometric data, DXA, blood levels of inflammatory and other markers (IL-6, TNF-alpha, glucose, etc.) as well as grip and knee strength were assessed. The serum CAF values were determined using a Western blot-based method. CAF levels in the sarcopenic test group were significantly higher than the levels of both the age-matched controls and an additional control group of ostensibly healthy blood donors. None of the variables under observation that might have influenced the significance of the results (diabetes, COPD, vitamin D levels) correlated to the CAF values. The results of this study indicate that remodelling of the neuromuscular junction by neurotrypsin is an important event in the development of sarcopenia.

P2503

Anti-MUSK myasthenia gravis responsive to rituximab

V. Serban
Neurology, Bon Secours - GSH, Suffern, NY, USA

Introduction: Myasthenia gravis (MG) is an autoimmune neuromuscular disease that is commonly associated with anti-Acetylcholine receptor antibodies. Few cases, mostly with bulbar involvement, are associated with anti-MUSK antibodies. Epidemiologic studies reveal a severe course and poor response to therapy of the anti-MUSK myasthenia gravis. Rarely, anti-MUSK myasthenia gravis is associated with thymus disease.
Case report: A 43-year-old right-handed man presented with a six-month course of diplopia, variable ptosis and severe dysarthria. He gradually developed axial weakness and shortness of breath. High titres of anti-MUSK antibodies were detected. Anti-acetylcholine receptor and anti-striated muscle antibodies were absent. Repetitive nerve stimulation (RNS) of the facial nerve at 3Hz revealed significant decrement and needle EMG revealed short-duration polyphasic potentials in the face, deltoid and biceps. His chest CT identified a thymic mass and he underwent thymectomy. Pathological exam revealed thymic hyperplasia and no malignant cells. He showed no clinical response after plasma exchange, anti-cholinesterase therapy and steroids. The treatment with IVIG in combination with immunosuppressors had no benefit. As last resort, infusions with Rituximab were initiated and significantly improved his muscle strength, diplopia and dysarthria.
Conclusion: Anti-MUSK myasthenia gravis is a rare autoimmune condition, but represents a diagnostic and therapeutic challenge. Rituximab could be used to treat poorly responsive cases. Further investigation is needed for a better understanding of the phenomena – thymus disease with anti-MUSK myasthenia gravis and the clinical response to immunomodulatory therapy.

P2504

Clinical test for myasthenia ptosis diagnosis

S. Kulikova, S. Likhachev
Republican Research Center of Neurology and Neurosurgery, Minsk, Belarus

The Ocular form of myasthenia is characterized by ptosis, extraocular muscle weakness and diplopia. According to our observations myasthenia ptosis existing in vertical pose disappears in antiorthostatic pose.

Material and methods: Patients with ptosis were divided into two groups: 1. main group - 35 patients with myasthenia ptosis, 2. control group - 28 patients with ptosis of another etiology: ophthalmoplegic myopathy - 6, oculomotor nerve impairment - 12, patients with subjective complaints, but without objective signs - 10. Ptosis was examined by gaze fixation in pose sitting upright and then in antiorthostatic position (patient lies horizontally with head turned down lower than body level). Ptosis degree was evaluated in points from 0 to 4 (0 point - absence ptosis, 4 point - full ptosis) Statistical analysis was performed with Wilcoxon test.

Results: Antiortostatic position decreased ptosis only in myasthenia patients ($p<0.05$). In another group ptosis degree was completely the same in both positions ($p>0.05$). Probably, this decreasing was caused by upper eyelid atony. In orthostatic position upper eyelid under the gravitation moved downward opened the pupil. In cases of eye orbicular muscle weakness, upper eyelid atony was maximal and antiorthostatic position caused complete ptosis disappearing. In cases of isolated m. levator palpebrae superior weakness ptosis disappearing was observed, too, but not so evident. In cases of ophthalmoplegic myopathy, oculomotor nerve impairment and pseudoptosis upper eyelid tone did not change.

Conclusion: Symptom of ptosis disappearing in anti-orthostatic position are typical for myasthenia patients and may be used in clinical practice.

P2505

Caveolinopathies in Greek patients with distinct clinical phenotypes

C. Papadopoulos[1], G. Papadimas[1], G. Terzis[1,2], A. Vontzalidis[1], V. Zouvelou[1], K. Spengos[1], P. Manta[1]
[1]Department of Neurology, University of Athens, Eginition Hospital, [2]Department of Laboratory of Track and Field, School of Physical Education and Sport Science, University of Athens, Greece

Introduction: Caveolin-3 is a muscle-specific protein related to the caveolae, the invaginations of the plasma membrane. Mutations of the caveolin-3 gene are responsible for the caveolinopathies, a group of disorders manifested as an autosomal dominant limb girdle muscular dystrophy (LGMD1C), isolated creatine kinase (CK) elevation, rippling muscle disease (RMD), a rare distal myopathy and a hypertrophic cardiomyopathy without skeletal muscle involvement.

Methods: We present the first 5 Greek patients with caveolin-3 deficiency. All these patients had been submitted to clinical and laboratory work-up. Their diagnosis has been confirmed on muscle biopsy and molecular analysis.

Results: The age at onset of the disease ranged from19 to 53 years. One patient presented with muscle cramps, calf hypertrophy and CK elevation. Another patient with a history of central nervous system demyelination, presented with increased CK and mild symmetrical proximal muscle weakness. Two patients were brothers but their clinical presentation was quiet distinct with one being wheelchair bound, while the other had only mild proximal muscle weakness and hyperCKemia. The last patient presented with asymptomatic hyperCKemia, muscle hypertrophy and percussion-induced muscle mounding.

Conclusion: Caveolinopathies are rare disorders and their phenotypic spectrum is wide even in the same family with patients being either seemingly healthy or even severely affected. Since the clinical manifestations and histochemical findings in muscle biopsy may overlap with features of other muscular dystrophies, a high clinical suspicion combined with the immunohistochemical detection of caveolin on muscle fibre is needed in order to reach a diagnosis.

P2506

Myasthenia gravis, invasive thymoma and primary hyperparathyroidism: a rare association

V. Zouvelou[1], M. Rentzos[1], T. Athanasoulis[2], G. Tzimas[1], I. Evdokimidis[1]
[1]Department of Neurology, University of Athens, Eginition Hospital, [2]Nucleal Medicine Department, Alexandra Hospital, University of Athens, Athens, Greece

We report a case of concurrent diagnosis of myasthenia gravis, invasive thymoma and primary hyperparathyroidism, where thymectomy and parathyroidectomy were performed simultaneously.
Case: A 53-year-old female was admitted for evaluation of two weeks history of dropped head and oculobulbar weakness. Acetylcholine receptor antibodies were 57nM. Repetitive nerve stimulation of the tested muscles was positive for myasthenia and CT findings of the mediastinum were suggestive of thymoma. Routine laboratory investigation revealed serum calcium 12.2mg/dl (normal range: 8.1-10.4), phosphorus 2.8mg/dl (normal range: 2.6-4.5) and parathyroid hormone levels 338pg/mL (normal range: 16-87). Neck ultrasound was normal and to localize the hyperfunctioning parathyroid(s) a 99mTc-sestamibi (99mTc-MIBI) scintiscan was performed. A single area of intense 99mTc-MIBI uptake and retention was detected close to the lower right thyroid lobe. The lesion was surgically removed and found to be a parathyroid adenoma. A large area of 99mTc-MIBI uptake was also found in the anterior mediastinum, demonstrating heterogeneous tracer uptake and irregular shape, histologically proved to be an invasive thymoma.
The coexistence of thymoma and parathyroid adenoma is rare and only 4 cases have been reported in the literature. The association between thymus and parathyroid disorders could be explained with the common embryologic origin of the thymus and parathyroid glands from the III and IV pharyngeal pouches. Our case highlights the significance of investigation of calcium metabolism in cases of myasthenia, even in the absence of symptoms or signs suggestive of parathyroid disorder.

P2507

The edrophonium effects on the saccadic eye movements in myasthenic patients

M. Dec[1], M. Rudzińska[1], T. Tomaszewski[1], M. Wójcik[1], J. Dylak[2], J. Ober[2], A. Szczudlik[1]
[1]Department of Neurology, Jagiellonian University, College of Medicine, Krakow, [2]Nałęcz Institute of Biocybernetics and Biomedical Engineering Polish Academy of Science, Poznan, Poland

Introduction: It is hypothesized that the pale global fibres of the extraocular muscle are responsible for the initial acceleration of saccade and the orbital fibres are responsible for maintaining the final position of the eye at the end of the saccade. There are only few studies concerning saccadic abnormalities and their response to edrophonium injection in the MG patients, but their results are contradictory.
Objectives: To asses an effect of edrophonium on the saccadic movements in the MG patients.
Materials: We studied 22 generalized MG patients (mean age: 45.4y; the mean duration of symptoms 6.81y) and 32 age and sex matched healthy controls. MG patients were tested before their first daily dose of medications.
Methods: The horizontal saccadic movements were evaluated with the head-mounted saccadometer (Ober Consulting). The saccadic movements parameters (mean peak saccadic velocity (PSV), amplitude, duration, latency) were analyzed three times: before, during and 10 minutes after the edrophonium injection. Controls were examined only for the saccadic movements.
Results: There was no statistical difference in the saccadic parameters between MG patients before the edrophonium injection and controls. After the edrophonium injection PSV in MG patients was significantly decreased (561.87 vs. 503.98 deg/s respectively; p=0.03). The decrease was also observed in the range of amplitude but this result was not statistically significant.
Conclusion: The results of the study support the hypothesis that the pale global fibres of the extraocular muscle are spared in the MG patients and the edrophonium injection generates a depolarizing blockade of their muscles.

P2508

Altered lipid components in skeletal muscle tissue of patients with muscular dystrophy as compared to normal subjects: in-vitro, high resolution NMR based observation

N.K. Srivastava[1], S. Pradhan[2], B. Mittal[3], D. Sharma[1]
[1]School of Life Sciences, Jawaharlal Nehru University, New Delhi, [2]Neurology, [3]Medical Genetics, SGPGIMS, Lucknow, India

P2509

Effect of L-arginine on neuromuscular transmission of the chick biventer cervicis muscle

D. Farzin, N.M. Gilani
Pharmacology, School of Medicine, Mazandaran University of Medical Sciences, Sari, Iran

P2510

Myasthenia gravis: its profile in CHU of Marrakech

I. Hajjaj, N. Louhab, N. Adali, N. Kissani
Neurology Department, CHU Mohammed VI, Marrakech, Morocco

P2511

Abstract cancelled

P2512

Evolution of post-thymectomy myasthenia gravis

A. Nacu[1], V. Lisnic[1], O. Slivca[1], T. Cucu[2], C. Grosu[2]
[1]Neurology, State Medical and Pharmaceutical University 'N. Testemitanu', [2]Neurology, Pediatric Rehabilitation Centre, Chisinau, Moldova

P2513

Thyrotoxic Periodic Paralysis – a case report and brief review of the literature

J. Lemos[1], F. Matias[2], C. Januário[2], L. Negrão[2]
[1]Neurology Department, [2]Coimbra University Hospital, Coimbra, Portugal

P2514

Myasthenia gravis associated with autoimmune thyroid disease

G. Yuksel, K. Tutkavul, Z. Bastug Gul, A. Akpinar, M. Gencer, F. Varlibas, H. Tireli
Haydarpasa Numune Education and Research Hospital, Neurology Department, Istanbul, Turkey

P2515

Abstract cancelled

P2516

Genetic aspects of myasthenia gravis in Georgia

N. Kvirkvelia[1,2], R. Shakarishvili[1,2], N. Mikava[2], N. Lobjanidze[2], T. Akhvlediani[2]
[1]1Sarajishvili Institute of Neurology and Neurosurgery, [2]Department of Neurology and Neurosurgery, Faculty of Medicine, Ivane Javakhishvili Tbilisi State University, Tbilisi, Georgia

P2517

The man who couldn't stop shaking

A.T. Carvalho[1], P. Barros[2], H. Morais[2], G. Sousa[3]
[1]Neurology, Centro Hospitalar Vila Nova Gaia / Espinho, [2]Neurology, Centro Hospitalar de Gaia/Espinho, [3]Neurology, Centro Hospitalar Gaia / Espinho, Vila Nova de Gaia, Portugal

P2518

Multifocal motor neuropathy and myasthenia gravis: a case report

S.M. Knezevic-Apostolski[1], V. Martic[2], I. Basta[3], V. Stanic[4], R. Raicevic[5], S.A. Apostolski[1]
[1]Neurology, Neurological Outpatient Clinic, [2]Neurology, Military Medical Academy, [3]Neurology, Clinical Centre of Serbia, [4]Thoracic Surgery, Military Medical Academy, [5]Neurology, Militay Medicl Academy, Belgrade, Serbia

P2519

Abstract cancelled

P2520

Delayed onset muscle soreness (DOMS): a case report

G. Yuksel, M. Gencer, F. Varlibas, Y. Cetinkaya, H. Tireli
Haydarpasa Numune Education and Research Hospital, Neurology Department, Istanbul, Turkey

P2521

Myasthenia gravis, a Portuguese hospital based series

J. Marques[1], S. Machado[2], S. Costa[2], A. Timoteo[2], A. Valverde[2], L. Santos[2]
[1]Instituto Português de Oncologia de Lisboa Francisco Gentil, Lisbon, [2]Hospital Professor Doutor Fernando Fonseca, EPE, Amadora, Portugal

Education in neurology; history in neurology; neuroethics; neurology and arts

P2522

Neurological cross-conversations between Europe and Sub-Saharan Africa: a win-win perspective

G. Naeije[1], F. Yepnjio[2], G. Tatah[2], J. Fonsah[2], Y. Fogang[2], B. Dachy[3], A. Njamnshi[2]
[1]Neurologie, Erasme, Université Libre de Bruxelles, Brussels, Belgium, [2]Neurology, Central Hospital, Yaounde, Cameroon, [3]Neurologie, CHU-Brugmann, Université Libre de Bruxelles, Brussels, Belgium

Introduction: Opportunities that allow neurologists-in-training from Western Europe and Sub-Saharan countries to gain from exchanges between neurological wards are seldomly considered.
Objective: To compare the patterns of neurological diseases encountered in neurological wards of public hospitals in Brussels and Yaoundé.
Patients and methods: For five months, age, mortality, HIV incidence and clinical characteristics of admitted patients were analysed. 80 Cameroonian and 105 Belgian patients were classified into the following neurological entities: infectious, vascular, immune, epileptic, degenerative, neoplastic, psychogenic and movement disorders. Means and proportions were compared using respectively Student's and Fisher's exact test.
Results: Patients were younger in Cameroon (45.3 vs 54.0 years old, $p=0.002$) but died four times more often (23.75 vs 4.75% of admissions, $p<0.001$). HIV incidence was 43.75% in Cameroon whereas nihil in Brussels. Infectious complications were responsible for 100% of deaths in HIV positive patients against 44% in HIV negative ($p=0.0108$). Proportion of vascular, neoplastic and movement disorders was comparable. Neurological complications of infectious diseases occurred ten times more in often Cameroon (69 vs 6.7%, $p<0.0001$). Multiple sclerosis accounted for 11.4% of admissions in Brussels but other immune-related diseases were more frequent in Yaoundé (8.75 vs 2%, $p=0.04$). Epileptic, degenerative and psychogenic diseases were more frequent in Brussels: 38.1% vs. 12.5% ($p<0.001$),16.2% vs. 5% and 3.75% vs. 14.3% ($p<0.0224$).
Conclusions: Exchanges between Western Europe and Sub-Saharan neurological wards could offer neurologists-in-training firsthand expertise in diseases seldomly met otherwise, an understanding in different healthcare systems and more insight in public health.

P2523

History of the Rydel-Seiffer tuning fork

M. Fishel
[1]Gimmeldingen, Germany

The tuning fork is a simple mechanical device whose use is a varied and colorful one from calibration of speed control instruments to tuning of symphonic instruments. The invention of the simple tuning fork is credited to the London lute a trumpeter in 1711 named John Shore. Its use as an otological tool for hearing testing became clear in the mid 1800s. Vibratory sensation as a separate testing modality, the absence termed pallanesthesia, was documented in the late 19th century. Heinrich Rumpf in 1889 recognized the tuning fork could be used to test a separate vibratory sensory modality however it was not until the 1920s that specific bony prominences were identified for testing. The 128Hz tuning fork became a routine part of the neurological examination shortly thereafter. In 1903, Germans A. Rydel and Fredrich Seiffer published a paper in the Archiv für Psychiatrie und Nervenkrankheiten describing a new type of semi-quantitative tuning fork, an instrument which now holds their names. In the paper they described adaption to the standard tuning fork which allows the examiner to quantify on an 8-point scale the degree of vibratory sensory impairment. The Rydel-Seiffer tuning fork has been in production at the same facility in Germany since 1908 and remains a valuable part of the neurological examination. They determined the ideal vibratory sensory frequency to be 108 Hz. The tuning fork's reproducible and accurate nature has been validated with the use of more modern sensory nerve action potentials.

P2524

Abstract cancelled

P2525

Bekhterev and Pavlov: two Russian giants in neurosciences at the end of 19th and beginning of 20th centuries

D. Labunskiy[1], V. Vorobiev[2]
[1]*Biomedical Engineering, University of Northern California, Santa Rosa, CA, USA,* [2]*Ovchinnikov Biotechnology Society, Moscow, Russia*

There was a number of contradictions between view of these two giants of neuroscience, general physiology and psychology one hundred years ago.
1) arguments about priority on discovery of conditioned reflexes.
2) Discussion on cortical centres of the nervous system.
Both scientists almost simultaneously started their training at the Medico-Surgical Academy in St. Petersburg, then became professors and academics. They moved by the parallel courses, one in neurology, the second in physiology. Their ways went smoothly until Pavlov became interested in the study of brain functions and therefore invaded in the very field of Bekhterev's expertise. The theory and study of conditioned reflex had absolute priority with Pavlov. In his speech Pavlov presented results of his students Wolfson and Snarsky about their experiments on 'psychic salivation' performed at the end of 19th century. The word 'reflex' in the vocabulary of the famous clinician (Bekhterev) appeared much later, when his collaborators in 1907 developed methods of combined movement reflexes on respiration and electric irritation But the problem of brain cortical function caused a new wave of frictions and arguments between the two scientists.
Pavlov, at the beginning of his studies criticized very harshly the theory of strict localization of brain functions in the brain cortex, but later on he developed his own theory of cortical analyzers and localization of dynamic functions.
The presented data demonstrate similarities and ambiguities in the creative work of two giants of Russian and world science.

P2526

Historical therapy of stroke in the work of Caelius Aurelianus

M. Lippert-Grüner
[1]*Medical Faculty, University of Cologne, Germany*

Caelius Aurelianus provides in his work Tardarum sive chronicarum passionum, which is based on Soranos' famous, but lost, work about acute and chronical illnesses a remarkably detailed description of the physiotherapy of paresis, which covers the complete therapeutic spectrum of the groundwork of a combined therapy. His view that rehabilitative treatment should be started from the second day of illness sounds almost revolutionary. Also modern early rehabilitation makes a specific use of a combined therapy in a way that is analogous to that described by Caelius Aurelianus. Even today the view is taken that a fast mobilisation of the patient is the top priority of therapy. The three-stage mobilisation therapy involving exercises in rolling-in-bed as well as practice in trying-to-sit-up is quite similar to what is common practice today.

P2527

Is the Charcot and Bernard's case (1883) of loss of visual imagery really based on neurological impairment?

N. Allegri[1], M. Cristoffanini[1], S. Zago[1], M. Porta[2], R. Ferrucci[3], A. Priori[3]
[1]*Dipartimento Scienze Neurologiche, Fondazione Ca' Granda IRCCS Ospedale Maggiore Policlinico,* [2]*Centro Tourette e Malattie Extrapiramidali, IRCCS Ospedale Galeazzi di Milano,* [3]*Dipartimento di Scienze Neurologiche Centro Clinico per Neuronanotecnologie e la Neurostimolazione, Fondazione Ca' Granda IRCCS Ospedale Maggiore Policlinico, Milano, Italy*

Monsieur X's case, described by Charcot and Bernard in Le Progrès Medical in 1883, has always been considered in literature as the first example of loss of mental imagery due to brain injury. This famous patient showed a sudden and persistent lack of ability to generate visual images, both anterograde and retrograde. Clinical examination established that Monsieur X suffered no motor or sensory neurological symptoms and the selective loss of visual imagery was the only outstanding feature in addition to some visual recognition problems. Notably, the authors did not offer any information about etiology or lesional site. Post-mortem examination, the only available method to locate cerebral lesions at the time, was not performed. Over the following years many other cases of impairment of visual mental imagery were reported and interpreted as psychopathological cases. Patients whose impaired ability to mentally represent objects, colours, people and places following brain damage were described only much later. Despite the Charcot and Bernard's case having provided neurological significance, the presence of similar cases of visual imagery impairment in the psychiatric field prompted us to support the hypothesis of a psychopathological rather than neurological genesis of Monsieur X's disorder.

P2528

Ethics of invasive techniques in neurobehavioral disease

P. Kalanithi, J. Henderson
Neurosurgery, Stanford University Hospitals and Clinics, Stanford, CA, USA

Introduction: Invasive techniques in neuromodulation have expanded in recent years. Deep brain stimulation for Parkinson's disease is only the most prominent indication. Depression, obsessive compulsive disorder, addiction, bulimia, obesity and other neurobehavioral disorders are all being actively attempted.
Objective: The history of neurosurgery for behavioural disorders is fraught with controversy, and careful consideration going forward is necessary. We review here the historical cases of Dr Heath to convert homosexuals to heterosexuals using surgically implanted brain electrodes to identify the key philosophical and procedural errors.
Methods: We acquired the original articles published by Dr Heath and reviewed them in detail by examining their historical, philosophical, moral, and scientific dimensions.
Results: The errors in the Heath experiments are not simply scientific or technical. Historical context, while important, cannot be relied on as exculpatory. The philosophical construct of disease, including mind-body considerations, require careful consideration in new developments in surgical intervention in neurobehavioral disorders.

P2529

Assistive technology for the impaired elderly: conflict between ethics and the cultural, social and financial context

L. Spiru, I. Turcu, R.I. Ursu, C. Ghita
Research and Development, Ana Aslan International Academy of Aging, Bucharest, Romania

Background and aims: Assistive Technology (AT) development could be regarded as one of the most suitable answers to the demographic aging. There are some critical matters associated with the application of AT for physically and/or cognitively impaired persons. The potential conflict between ethics and the cultural, social and financial context deserves sustained attention.
Methods: The outcomes of a wide bibliographic study are pointed out together with certain insights resulted from our participation in two EU-IST-FP6 projects: SHARE-it and K4Care.
Results: The possible constraints of ethical reasoning in AT applications could be of cultural (instruction level, customs, religion), social (rural/urban area, home/institutionalized milieu, family particularities, social insertion degree) and financial order (income size, assurance systems' support), or could be related to the health care system (AT use awareness, qualified workforce) and the legislation (uncertainty about rights and responsibilities). Tensions and conflicts that may be induced by end-user related factors (purpose for which technology is introduced, the degree of involvement of the person, especially when judgement capacity may be limited, the involvement of significant others - family, friends, neighbours and professional care staff), and the effect on the person are also analyzed and exemplified based on the two projects cited above.
Conclusions: The dialog with users and their associations' representatives for the design of the AT platforms and the improvement of the specific ethical principles, as well as the dialog between all the factors involved: researchers, users, care givers, providers, governmental and civil society institutions, are capital requirements.

P2530

Neurological disorders reported by Dr. Anton Chekhov (1860-1904)

S.F. Ford, A.J. Larner
Walton Centre for Neurology and Neurosurgery, Liverpool, UK

Objective: To report neurological disorders described in the literary works of Anton Chekhov (1860-1904), the Russian writer and doctor, the sesquicentenary of whose birth is marked in 2010.
Methods: Analysis of all Chekhov's plays and some of his short stories for possible accounts of neurological disorders.
Results: Accounts of headache were found in three plays: Ivanov (the title character), Three Sisters (Olga), and The Jubilee (Shipoochin: specifically "a migraine"). A possible account of obstructive sleep apnoea-hypopnoea syndrome complicated by hypertension and stroke is found in The Cherry Orchard (Boris Borisovich Simeonov-Pishchik). A possible account of visual agnosia was identified in the short story The Kiss (Ryabovich) first published in 1887, referred to by the author as "psychic blindness".
Conclusions: Chekhov incorporated his knowledge of medicine, including neurological disorders, into some of his literary works. His description of agnosia precedes the classical accounts of Lissauer (1890) and Freud (1891).

P2531

The syndrome of Don Quixote

I. Iniesta
Neurology, The Walton Centre NHS Foundation Trust, Liverpool, UK

Introduction: In 1979, Graziella Magherini described cases among tourists and visitors in Florence who experienced tachycardia, confusion and hallucinations when shown masterpieces of plastic art, particularly at the gallery of the Uffizi. This psychosomatic reaction was called the Stendhal Syndrome, after the French author of Naples and Florence: A journey from Milan to Reggio's detailed account of the symptoms he experienced during his visit to the former Italian capital.
Design: In a more elaborated and not necessarily disturbing way, the term Don Quixote Syndrome is proposed here to describe the neuropsychological transformations resulting from reading fictional literature. A term which bears the name of Miguel de Cervantes' most famous character, who after reading books of chivalry felt the necessity to become a knight, changed his name of Alonso Quijano for that of Don Quixote from La Mancha and went in search of adventures with the purpose of helping the humiliated and the offended. Don Quixote Syndrome can vary in intensity: from the enthusiastic reading of literary fiction to delusional fantasies, over-interpretations of radical religious nature leading to significant behavioural changes with fatal outcomes.
Conclusion: One of the refreshing ironies of Cervantes´novel is the lucid reconversion of Don Quixote into Alonso Quijano with the mock and criticism of the chivalry books he had read. This together with the lack of violent deaths and dogmatism free approach of Cervantes represents the best example of Don Quixote´s syndrome in the sense of transforming the readers of El Quijote in better human beings.

P2532

Persistent right personal spatial neglect and denial of motor deficit in an Iranian violin maestro with a left parieto-frontal glioblastoma

A. Najlerahim[1], Z. Moradi[2]
[1]Shahid Beheshti University, [2]Neuroscience, Shahid Beheshti, Tehran, Iran

A rapidly growing brain tumour (Glioblastoma multiform) in the left fronto-parietal lobe of a right handed well-known Iranian musician and violin maestro Asodolah Malek resulted in right unilateral spatial perceptual and representational personal neglect and denial of contra lesional motor deficit. The violin was used as a neuropsychological tool in this case. These findings are based on direct observation and analyzing in a documented film of the patient during manipulation of the violin, pretended playing it and listening to the music played by the violin.

P2533

Electrophysiological evidence for semantic within-category task across different styles

M.-H. Lin[1], C.-Y. Wang[1], S.-K. Cheng[2], S.-H. Cheng[1]
[1]Institute of Applied Arts, National Chiao Tung University, Hsinchu, [2]Institute of Cognitive Neuroscience, National Central University, Taoyuan, Taiwan R.O.C.

Many semantic category studies have found the significant N400 effect on the perceptual categorization task (e.g., birds vs. cats) rather than on the within-category identification task (e.g., distinguished golden retrievers from other dogs). However, is it the same in the artificial world (e.g., arts and designs)? In this study, ERP was examined by showing the various pairs of pictures of tables and chairs to 18 healthy participants. The pictures were selected and divided into four groups based on design expertise: normal, minimal, ready-made, and deconstruction. In the sequent trials, the typical tables (normal) were matched to four styles of chairs randomly. It recorded participants' semantic matching performances and reaction time to examine the degree of conflict and observed the semantically incongruent response.

Behavioural results exhibited that the groups with both less match degree to normal table and shorter reaction time in order were deconstruction, ready-made, minimal, and normal chairs. ERP result displayed that ready-made chair group (combination of found objects) reached N400 maximum amplitude than others at anterior and central scale regions. Deconstruction chair group (non-rectilinear shapes serve to distort, deform and dislocate elements or structure) activated the greatest late positive component (LPC) than others at anterior, left posterior and right posterior scale regions. There was no significant effect between minimal (object is reduced to its necessary elements) and normal chair groups at N400 or LPC. These findings suggest that the within-category identification task to the artifacts could obtain significant N400 when they were strongly different in style.

P2534

The neurobiology of sexual orientation

J. Goldstein
San Francisco Clinical Research Center, San Francisco, CA, USA

Homosexuality is a constantly debated issue as to whether it is determined at birth or a choice (nature vs. nurture). The works of the Kinsey Reports and Dr. Evelyn Hooker published in the 1950s resulted in the removal of homosexuality from the DSM4 in 1973. Since then, it has been mentioned as an illness only in the context of being a putative exacerbating factor in anxiety states. Recent studies reveal a clear cut neurobiology to sexual orientation. Neurobiologist Simon LeVay conducted a study of brain tissue samples from 41 human autopsies performed at several hospitals in New York and California. He found a significant size difference of the interstitial nuclei of the anterior hypothalamus between homosexual and heterosexual men. In addition, Dr. Ivanka Savic-Berglund and Dr. Per Lindström of the Karolinska Institute, Stockholm, performed fMRI and PET measurements of cerebral blood flow. Using volumetric studies, they found significant cerebral size differences between homosexual and heterosexual subjects; the brains of homosexual men resembled heterosexual women and homosexual women resembled heterosexual men. Pheromonal studies also have added to the scientific knowledge of sexuality. Sex-atypical connections were found among homosexual participants. Amygdala connectivity differences were found to be statistically significant and provided evidence towards sexual dimorphism between heterosexual and homosexual subjects. Extensive controls were performed during testing to exclude analytical variability. A totally evidence-based medicine presentation will provide current data regarding homosexuality showing differences, or similarities, between the brains of homosexuals and heterosexuals.

P2535

Stroke education program and improvement of general knowledge of stroke in high school students – the PRESENT project

S.-H. Suk[1], J.-L. Jung[2], S.-H. Hwang[3], I.-S. Ko[4], J.-H. Lee[5], Y.-K. Min[6], J.-H. Park[7]
[1]Department of Neurology, Wonkwang University Sanbon Medical Center and Wonkwang University Ansan Municipal Geriatric Hospital, [2]Department of Neurology, Wonkwang University Sanbon Medical Center, Gunpo-si, [3]Department of Neurology, Hallym University Gangnam Sacred Hospital, [4]Department of Neurology, National Medical Center, Seoul, [5]Department of Neurology, Health Insurance Company Ilsan Hospital, Ilsan, [6]Department of Neurology, Hallym University Hangang Sacred Hospital, [7]Department of Neurology, Inje University Sanggye Paik Hospital, Seoul, Republic of Korea

Background and objective: Education for stroke prevention may play a major role in detecting people at high risk for stroke and in reducing incidence of stroke. The advanced age has been the main target for this program. The level of knowledge of stroke among late teens and effectiveness of the education for those are not known.
Methods: We did perform pre-education (Pre-E) and 2 times post-education questionnaires (just after education, Post-E0 and 2 weeks later, Post-E2) to 11th and 12th grade students (1269 in Pre-E, 1247 and 1230 in Post-E0 and Post-E2 respectively) who were in one of the high schools in Ansan city. The education for stroke prevention was conducted between the questionnaire sessions. How much their knowledge on stroke after the education has improved was evaluated as an indicator of its effectiveness.
Result: 74.3% of subjects already knew what stroke is from vascular disease of brain. 91.9% also recognised stroke as a preventable disease. Only 20.9% answered on Pre-E that stroke was one of major causes of disability in adults. However, 37.2% and 32.8% answered correctly at Post-E0 and Post-E2 respectively ($p<0.001$). Awareness rate about why stroke occured and what stroke risk factors were increased significantly after the program and the effect of education sustained until 2 weeks later.
Conclusion: The early education program for stroke prevention to high school students has increased significantly the general knowledge on stroke. This program should be included in school health programs to build up good health behaviour.

P2536

International Parkinson's disease summer school for healthcare students; teamwork in healthcare, innovation in education, creativity in research

P.D.G. de Roos[1], K. Tostovr nik[2], S. de Roos[3], J.K. Holland[4], K. Nesterowicz[5]
[1]Neurology, Amstelland Ziekenhuis, Amstelveen, The Netherlands, [2]Medicinska Fakulteta, Ljubljana, Slovenia, [3]VU University Medical Center, Amsterdam, The Netherlands, [4]Psychology, Oxford University, Oxford, UK, [5]Jagiellonian University Medical College, Krakow, Poland

Introduction: academic education is designed around academic departments rather than around students or patients. This initiative puts students and patients in the centre and uses engaging educational methods to build academic expertise.

Objectives:

(1) Design a learning environment in which the passion and interest of a students for a topic is the core

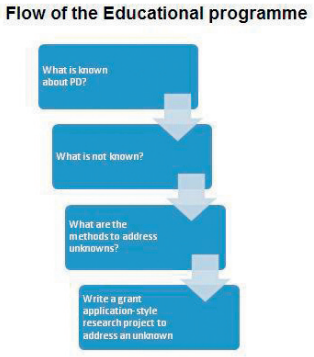
(2) to create a relevant PhD-style research project proposal, in the time limit of the summer school.

Aims:

(1) pilot educational strategies which could contribute to a paradigm shift towards the approach of academic education.

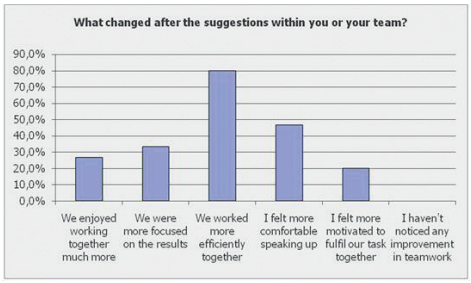
(2) Attract more talented students to academic careers.

Methods: Student recruitment and selection was supported by European healthcare students associations. A challenging learning environment was designed



to contain teamwork in small groups, with tasks causing time pressure, stress, cultural differences, as well as differences in knowledge and skills. Trainers supervised the small group team work process, providing feedback and training to improve teamwork. Students presented their work to experts who provided feedback and in depth discussions supporting the learning process.

Results: Participants (n=16), from 8 different countries. The majority of evaluations by participants with regards to the various aspects of the programme was very positive. Perspectives on intervention of trainers:



Conclusion: Although we sparked a high level of motivation and interesting academic thoughts, the summer school design needs further development in order to reach the level of a "PhD"-research proposal, which we hope to achieve in 2010.

P2537

Citation metrics in European neurology and neurosurgery – the case of Greece

G.K. Matis[1], A. Kiriakidou[2], O.I. Chrysou[1], D. Peios[1], I. Moralis[1], K. Kontogiannidis[1], N. Lyratzopoulos[1], G. Tsivgoulis[3], T.A. Birbilis[1]
[1]Department of Neurosurgery, Democritus University of Thrace, Medical School, Alexandroupolis, [2]Department of Neurology, Aristotle University, Medical School, Thessaloníki, [3]Department of Neurology, Democritus University of Thrace, Medical School, Alexandroupolis, Greece

P2538

Education in neurology. Many students just beginning their science education may be unfamiliar with the concept of an abstract in a lab report

A.A. Mukadam
Mikky Aluminium Nig Enterprises, Dopemu Agege, Nigeria

Autonomic nervous system disorders; clinical neurophysiology; neuro-ophthalmology, -otology

P2539

Respiratory alterations during sleep in familial dysautonomia

S. Moeller[1], F.B. Axelrod[2], D.M. Rapoport[3], I. Ayappa[3], S. Buechner[4], H. Sczepanska[4], N. Dimitrov[4], M.J. Hilz[1,5]
[1]Neurology, University of Erlangen-Nuremberg, Erlangen, Germany, [2]Paediatrics, [3]Medicine, [4]Neurology, [5]Neurology, Medicine, Psychiatry, New York University School of Medicine, New York, NY, USA

Introduction: Sudden death during sleep is a risk in familial dysautonomia (FD). Respiratory abnormalities might contribute to fatalities.
Objective: This study was performed to assess respiratory abnormalities in FD during sleep.
Methods: In 11 FD patients (5 females, 28±11 years) and 11 age- and sex-matched controls (6 females, 28±11 years), we recorded polysomnographic signals during one night, and assessed sleep latency, REM latency, sleep stages, number of sleep cycles and apnoeas. Apnoea responses were classified as oxygen desaturation (≥4% SatO2-decrease within 30sec) or arousals (≥3sec abrupt shift in electroencephalographic frequencies to alpha- or theta-activity or frequencies >16Hz). Chi²-test compared numbers of patients and controls with apnoea, desaturation or arousal. U-test assessed differences in frequencies of individual apnoeas, desaturations or arousals between patients and controls (significance: $p<0.05$).
Results: 10 patients and 4 controls had apnoeas ($p<0.05$). 9 patients and 1 control developed deoxygenation ($p<0.05$); 3 patients and 1 control had arousals. Apnoea frequency (median, 25th percentile; 75th percentile, range) was higher in patients (8; 5; 18; 0-28) than in controls (0; 0; 1; 0-2; $p<0.05$). Apnoea-induced desaturations also were more frequent in patients (6; 2; 10; 0-26) than in controls (0; 0; 0; 0-1; $p<0.05$) while arousal frequency was similar in patients (0; 0; 1; 0-2) and controls (0, 0, 0, 0-1).
Conclusion: High frequency of sleep apnoeas and deoxygenation in FD patients may cause fatalities, as deoxygenation which induces hypoventilation, arterial hypotension, and bradyarrhythmia in FD patients (Bernardi et al. Am J Respir Crit Care Med. 2003;167:141-9).

P2540

Autonomic reinnervation of the transplanted heart – physiological observations from one month to up to 23 years after cardiac transplantation

Z.A. Siddiqi[1], Z. Du[1], A. Jamil[1], M. Chan[2], J.R. Burton[2], D. Kim[2], W. Tymchak[2]
[1]Neurology, [2]Cardiology, University of Alberta, Edmonton, AB, Canada

Purpose: Many studies report partial restoration of sympathetic innervation to a transplanted heart. This study was aimed to determine physiological markers that correlate with autonomic reinnervation in cardiac transplant patients.
Methods and materials: 24 cardiac transplant recipients were divided into an early (<3 years) and a late (>3 years) group based on the time since transplant. Autonomic reinnervation was assessed by testing heart rate (HR) variability and beat to beat blood pressure (BP) changes during various physiologic manoeuvres. Paired student T-tests were employed to compare the two groups.
Results: HR variability during DB was markedly abnormal in all participants. Valsalva ratio (VR) was abnormal in the early group but improved significantly in the late group. Systolic BP during VM showed excessive drop in early phase II, worse in recent transplant recipients. BP rise in the late phase II and the phase IV showed no significant difference between groups, though phase IV was normal in certain patients. Significant orthostasis was present in the early group but it was negligible >10 years after transplant. DBP rise during sustained hand grip was not affected in most patients. Both groups showed a comparable increase in BP during mental stress tests though the HR response was markedly diminished early after transplant with significant recovery in the late group.
Conclusions: Sympathetic indices show variable but definite improvement over time in cardiac transplant recipients, which may reflect restoration of sympathetic nerves. There is no definite evidence of parasympathetic reinnervation even 20 years post-transplant.

P2541

Supine squatting supports cardiovascular recovery of familial dysautonomia patients

E.C. Ehmann[1], H. Marthol[1], R. Baltadzhieva[2], S. Möller[1], F.B. Axelrod[2], M.J. Hilz[1,2]
[1]Neurology, University of Erlangen-Nuremberg, Erlangen, Germany, [2]Neurology, New York University School of Medicine, New York City, NY, USA

Background: Familial Dysautonomia (FD) is associated with severe orthostatic hypotension (OH) which improves with reclining, squatting or abdominal compression. Combined reclining and splanchnic compression ("supine-squatting") might promote cardiovascular recovery.
Objective: To evaluate recovery-times of blood pressure (BP) and superior-mesenteric-artery (SMA) blood-flow upon supine positioning after OH, without and with "supine-squatting".
Methods: In 11 FDs (18±4 years) and 12 age-matched controls, we recorded heart rate (HR) BP, cross-sectional SMA-area and SMA-mean velocity (SMA-Vel) using Doppler-ultrasound. We assessed SMA-blood-flow (SMA-BF) as SMA-Vel X SMA-area, and SMA-resistance as MBP/SMA-BF-ratio. We determined parameters during 5minutes supine position, at 90° head-up tilt (standing), upon return to supine without, and in a second trial with "supine-squatting". BP-recovery-times were defined as times from tilting-back until BP returned to baseline values minus 2SD.
Results: In FDs, BP during standing (95.0±26.0mmHg) was lower than supine BP (147.0±17.3mmHg, $p<0.05$). In controls, standing did not change BP. Without squatting, BP recovery-times were longer in FDs than controls (85.4±60.9s vs. 12.6±27.3s; $p<0.05$). With squatting, recovery-times of patients (36.6±49.5s) and controls (26.0±44.8s) were similar. Upon standing, both groups decreased SMA-Area, SMA-Vel, SMA-BF ($p<0.05$). FDs had slightly lower SMA-Vel and significantly lower SMA-BF with than without "supine-squatting". Only controls increased their SMA-resistance upon standing. SMA-resistance decreased upon return to supine without squatting in both groups but increased in FDs during "supine squatting".
Conclusion: "Supine-squatting" shortens recovery-times after OH, very likely because of increased SMA-resistance, reduced splanchnic pooling and increased blood redistribution to heart and brain.

P2542

Cardiovascular autonomic function in different ALS phenotypes

M. Miller, A. Piatek, K. Blonska, A. Kyrcz, A. Slowik, M. Tutaj, B. Tomik, A. Szczudlik
Department of Neurology, Jagiellonian University Medical College, Krakow, Poland

Introduction: Amyotrophic lateral sclerosis (ALS) is a motor neuron disease, but may also involve the autonomic nervous system. Several different ALS phenotypes were described: bulbar onset ALS [ALS-B], limb-onset ALS [ALS-L], as well as rare phenotypes, i.e. flail arms or flail legs [FA/FL]. They differ in risk factors, clinical picture and prognosis. Profile of cardiovascular autonomic system dysfunction has not been studied systematically in different ALS phenotypes.
Objective: To compare heart rate (HR) and blood pressure (BP) responses to cold face test (CFT) in different ALS phenotypes.
Material and methods: We continuously monitored HR, systolic (SBP), mean (MBP), and diastolic BP (DBP) by means of applanation tonometry in 19 patients, aged 59±10 years (5-ALS-B, 7-ALS-L, 7-FA/FL phenotypes) and in 12 age-matched controls, at rest and during 1-minute facial cooling. HR and BP responses to CFT were assessed as changes (dHR, dSBP, dMBP, dDBP) from baseline.
Results: HR decreased significantly during CFT as compared to baseline both in controls and patients ($p<0.05$). There was a significant increase in SBP, MBP and DBP both in controls and patients ($p<0.02$), except ALS-B (p=n.s.). Increases in SBP and MBP were significantly higher in FA/FL than in controls (dSBP: 36.89±21.08mmHg vs. 13.95±9.67mmHg, p=0.02; dMBP: 32.22±20.07mmHg vs. 9.91±6.81mmHg, p=0.005). The changes in MBP observed in FA/FL (dMBP: 32.22±20.07mmHg) were greater than those in ALS-B (dMBP: 9.07±15.18mmHg, p=0.02) or ALS-L (dMBP: 14.48±9.02mmHg, p=0.06).
Conclusions: Sympathetic vascular activity during CFT is differently affected in ALS-B and FA/FL, with impaired response in ALS-B and enhanced sympathetic activation in FA/FL.

P2543

Central pro-opiomelanocortin (POMC) system as an effective mechanism in central actions of serotonin in haemorrhage-shocked rats

P. Sowa, M. Adamczyk-Sowa, K. Pierzchala, G. Namyslowski
Medical University of Silesia, Zabrze, Poland

Raphe nuclei and serotonin projections in CNS modulate and participate in a wide variety of life important processes. As we presented before, centrally acting serotonin (5-HT) has a strong resuscitative effects and central activation of 5-HT1A receptors induces heart rate and blood pressure increase in haemorrhage-shocked rats. Those effects are at least partially connected with sympathetic nervous system activation. In the present work influence of effectory mechanisms: vasopressin, renin-angiotensin system and proopiomelanocortin (POMC) system were investigated. In fully anesthetized male Wistar rats when the haemorrhagic shock was induced (mean arterial pressure, MAP - 20-25 mmHg). Peripheral angiotensin II and vasopressin receptors (ATI and V1a) were selectively blocked using ZD7155 and [β-merkapto-β, β-cyclopentametylenopropionylo1,0-me-Tyr2,Arg8] AVP, respectively, given intravenously (iv) 5 min before intracerebroventricular (icv) injection of 8-OH-DPAT (selective 5-HT1A agonist). To investigate the effects regulated by POMC system, central MC4 receptors were selectively inhibited using HS014 given icv 5 min before icv 8-OH-DPAT administration. Selective blocking of peripheral ATI-angiotensin II receptors and V1a-vasopressin receptors had no influence on resuscitative effect of 8-OH-DPAT. However, HS014 partially inhibited the increase in MAP after 8-OH-DPAT ($p<0.05$), with no effect on heart rate. Moreover the increase in MAP was delayed (15min vs. 5min). Furthermore, peripheral resistance (renal, mesenteric and hindquarters) were statistically lower compared with the 8-OH-DPAT-only treated group. In conclusion, central POMC system and MC4 receptors participate in resuscitative effects of centrally activation of 5-HT1A receptors. As effectory mechanisms, vasopressin and renin-angiotensin system are not involved.

P2544

Postural orthostatic tachycardia syndrome and anxiety: a retrospective analysis and review of literature

S. Hoedl, W. Struhal, S. Schmidegg, G. Ransmayr
Neurology and Psychiatry, AKH, Linz, Austria

Objectives: Anxiety and depression are only two of the common symptoms reported by patients with postural orthostatic tachycardia syndrome that can lead to a psychiatric misdiagnose. Raj et al (1) showed in a recent study that POTS patients do not have an increased lifetime prevalence of psychiatric disorders, but experience significant inattention which may be an important source of disability.
Patients and method: 66 POTS patients were retrospectively assessed for
1) a psychiatric disorder before POTS;
2) the development of a new psychogenic disorder; and
3) previous psychiatric misdiagnoses.
Results: Out of a total of 66 POTS patients, it was found that 6 patients had a psychiatric disease long before POTS, 4 patients were misdiagnosed as psychogenic and 9 patients developed a psychiatric disease during the time in which they already had POTS.
Conclusion: POTS is not caused by anxiety. In our POTS patients 14% developed a psychiatric disease. More investigations have to be made to evaluate the significance of the co-morbidity of psychogenic diseases in POTS patients.
Literature: 1. Raj et al. Psychiatric profile and attention deficits in postural tachycardia syndrome.
JNeuolNeurosurgPsychiatry 2009; 80:339-344.

P2545

Cortical gray matter changes in primary blepharospasm: a voxel-based morphometry study

D. Martino, A. Di Giorgio
Università di Bari, Italy

Background: Previous voxel-based morphometry (VBM) studies of patients with primary blepharospasm (BSP) documented gray matter (GM) volumetric differences of striatum, cerebellum, thalamus, and parietal lobe areas. However, these studies recruited relatively small samples and did not always provide detailed clinical information on BSP patients.
Objective: To confirm the findings from previous works on a larger clinical sample, and expand upon previous works by evaluating whether clinical features of BSP correlate to whole-brain GM changes.
Methods: VBM of T1-images was performed on 25 patients with primary adult-onset BSP and 26 age-matched healthy controls. Clinical data were collected through a standardized interview. Severity of BSP was measured using the Jankovic Rating Scale.
Results: Patients with BSP had greater GM volume than controls in right and left superior frontal gyrus, right and left middle frontal gyrus, and in anterior cingulate cortex, whereas BSP patients had smaller GM volume than controls in right and left post-central gyrus, right precentral gyrus, and in left superior temporal gyrus and uncus. Spearman's correlation analyses indicated a significant negative correlation between the presence of geste antagoniste (GA) and GM volume in the left middle frontal gyrus ($r=-0.42$, $p=0.03$).
Conclusions: BSP patients exhibited GM volume differences exclusively within cortical regions highly relevant to motor control. GM changes within primary sensory-motor cortex may represent a common trait of primary dystonias, including BSP. Our results also suggest a possible implication of the left dorsolateral prefrontal cortex in the mechanisms underlying the use of GA in BSP patients.

P2546

Vestibular self-motion perception: comparison of velocity-storage contribution in cerebellar and healthy subjects

G. Bertolini[1,2], S. Marti[1], S. Ramat[2], D. Straumann[1], A. Palla[1]
[1]Neurology Department, Zurich University Hospital, Zurich, Switzerland, [2]Dipartimento di Informatica e Sistemistica, Università di Pavia, Italy

The cerebellar nodulus and ventral uvula play an important role in the velocity-storage mechanism (VSM), prolonging the time constant (TC) of the angular vestibulo-ocular reflex (aVOR). Self-motion perception (SMP) in response to constant-velocity rotation decays with a TC similar to that of aVOR, suggesting that SMP depends on VSM. To further elucidate the SMP-VSM interrelationship, we simultaneously recorded perceived angular velocity (PAV; reported by hand-wheel-turning) and reflexive eye movements (search-coils) in 3 patients with midline cerebellar atrophy (69-82y) and in 4 healthy subjects (hS; 69-80y) after the sudden deceleration (100°/s2) from constant-velocity yaw rotations (90°/s). aVOR and PAV were analyzed using a two TC model (Raphan et al. 1979) with a direct pathway, conveying semicircular canal (SCC) activity, and an indirect pathway, implementing VSM. An optimization procedure used one TCSCC and one TCVSM to fit simultaneously acquired aVOR and PAV data allowing gains free to vary. Median TCVSM was significantly longer in patients (24s; [17-34]) than hS (13s; [7-15]). For aVOR, median indirect pathway gain was 10% [2-11] of the direct pathway gain in patients, and 16% [10-22] in hS ($p<0.05$). For PAV, median indirect to direct pathway gain was 37% [18-42] in patients and 25% [6-36] in hS ($p<0.05$). Thus, on average, relative indirect pathway (i.e. VSM) contribution was greater for PAV than for aVOR in patients and hS. The prolonged aVOR and PAV TCVSM in patients, however, went along with an increased PAV-VSM contribution. We conclude that in cerebellar patients the VSM substantially contributes to SMP.

P2547

Dizziness in the elderly: diagnoses in a multidisciplinary dizziness unit

R.B. van Leeuwen[1], T.D. Bruintjes[2]
[1]Neurology, [2]ENT, Gelre Hospital, Apeldoorn, The Netherlands

Background: Dizziness in elderly people is common: prevalence of disabling dizziness is about 10-20% in persons over 70 years and increases with age. It has a significant impact on the quality of life.
Objective: To evaluate the diagnosis in patients with dizziness aged >70 years.
Methods: From 2000 until 2008 731 patients over 70 years were assessed by both authors in a multidisciplinary dizziness unit. Patients received an extensive questionnaire at home, including the "Nijmegen Questionnaire" for hyperventilation. During half a day all patients went through the following tests: vestibular testing, audiometry, orthostatic hypotension test and a hyperventilation provocation test in the pulmonary function laboratory. After these tests the patients were seen in the unit by an ENT surgeon and a neurologist at the same time. Strict diagnostic criteria were used. The diagnosis was made by the ENT surgeon and the neurologist by mutual consensus.
Results: In 85% of patients a diagnosis could be made, the most common cause of dizziness was BPPV, the second most common cause was hyperventilation syndrome and/or anxiety disorder. A second diagnosis of dizziness was made in 25% of the patients of 70 years and above.
Conclusion: In a vast majority of elderly patients with dizziness it is possible to reach a diagnosis and to treat accordingly.

P2548

A cavernous malformation in the medulla oblongata presenting only as upbeating nystagmus

H. Choi, C.-H. Kim, K.-Y. Lee, Y.J. Lee, S.-H. Koh
Neurology, Hanyang University College of Medicine, Gurisi, Republic of Korea

Cavernous malformation is a vascular malformation that occurs throughout the central nervous system. Brainstem cavernous malformation is relatively common and induces variable neurological symptoms, such as headache, vertigo, and cranial nerve deficits. But there is no report about a case of cavernous malformation in the medulla oblongata only presenting with upbeat nystagmus without any other neurological deficit. An 18-year-old woman had visited our outpatient clinic with complaints of continuous vertical oscillopsia. Her symptom had suddenly developed two days earlier. In ocular motor examination, continuous conjugated upbeat nystagmus was observed in primary position of gaze. Nystagmus was slightly increased in upward gaze, decreased in downward gaze, but not modified by lateral gaze. Otherwise, there were no remarkable neurological symptoms or signs. Brain CT and MRI showed focal hemorrhagic signal in the central caudal medulla caused by cavernous malformation. The spontaneous upbeat nystagmus disappeared gradually as the haemorrhage resolved over the time. Upbeat nystagmus has been described in bilateral lesions of the upward vestibulo-ocular reflex (VOR) pathway in the medulla, ventral tegmentum, anterior vermis of cerebellum, and midbrain. Only the upbeat nystagmus shown in our case suggests that focal haemorrhage in medullary cavernous malformation might injure the perihypoglossal nuclei and nucleus intercalatus which contribute to vertical oculomotor integrator without involvement of adjacent brainstem structures.

P2549

The effect of goal-directed lactated Ringer's solution versus albumin on intraocular pressure during prone spine surgery

E. Farag[1], J. Cata[2], L. Saager[2], A. Kurz[2]
[1]General Anesthesiology, [2]Outcomes Research, Cleveland Clinic, Cleveland, OH, USA

Introduction: Vision loss after spine surgery is a devastating problem (1). We therefore tested the hypothesis that intravenous albumin is associated with less IOP elevation than crystalloid in patients having spine surgery in prone position.
Methods: 65 patients undergoing major spine surgery with instrumentation were randomized to 5% albumin or lactated Ringer's solution (LR). (Patients were separately randomized to receive topical eye treatment with alpha-2-agonists.) The baseline infusion was 2ml/kg/h of LR. Colloid and crystalloid management cannot be directly compared without using goal-directed management to optimize vascular volume with each fluid. Intra-ocular pressure was measured with a pulse pneumatonometer. The effect of albumin versus LR on the primary outcome of time weighted average (TWA) IOP was assessed by analysis of covariance adjusting for eye drop intervention and preoperative IOP.
Results: The randomized groups were well balanced at baseline and intraoperative hemodynamic parameters were comparable in each group. IOP was similar in each group, with an adjusted mean time-weighted difference of -1.8 [-5.9, 2.4] mmHg (p=0.40). There was also no significant effect of fluid type on change from baseline IOP (p=0.10) or the fraction of patients with IOP≥50 mmHg (p=0.99).
Discussion: The increase in IOP during prone spine surgery was substantial, and maximum IOP exceeded 50mmHg in about a fifth of the patients. Using goal-directed management, substituting albumin for LR did not reduce mean IOP or the fraction of patients with IOP>50mmHg.
References: 1. Neurosurgery 2000; 46: 625-30

P2550

Abstract cancelled

P2551

Evaluation of the cardiovascular autonomic dysfunction in patients with Parkinson's disease

S.G. Mantarova, N.D. Dimitrov, I.V. Velcheva
Department of Neurology, Medical University of Sofia, Sofia, Bulgaria

The aim of the study was to evaluate the cardiovascular autonomic disturbances in patients with Parkinson's disease (PD) and to compare them with the disease duration and the applied treatment. Non-invasive monitoring of heart rate, blood pressure and respiration at rest and during autonomic tests (metronomic breathing and head-up tilt) was performed in 25 patients with PD without clinical autonomic symptoms and in 23 healthy controls. 15 patients were treated with levodopa, while the other 10 did not receive levodopa. The spectral analysis parameters: low frequency power (LF), high frequency power (HF), LF/HF ratio and total power (TP) were calculated. At rest the TP and the LF spectral components in the patients with PD were decreased in comparison to controls. Similar to controls, the autoregulatory response during the deep breathing test in the patients without levodopa treatment was preserved. However, the patients who received levodopa have significantly decreased LF/HF values (1.64±1.04 vs. 7.47±6.01). In both patients' subgroups impairment of the sympathovagal balance was established during the head-up tilt and it was more pronounced in those with levodopa treatment. The observed autonomic dysfunction was not associated with the duration of the disease.

P2552

Ambulatory blood pressure variability in Parkinson's disease

T. Henriksen[1], J. Mehlsen[2]
[1]*Neurology, Bispebjerg Hospital, Copenhagen NV,*
[2]*Coordinating Research Centre, Frederiksberg University Hospital, Frederiksberg, Denmark*

Dysautonomia in Parkinson's disease (PD) is associated with abnormal 24-hour blood pressure pattern (AMBP) including variable blood pressure load and sometimes an inverse blood pressure profile leading to increased nycturia and perhaps abnormal sleeping pattern. We compared ABPM in patients with PD and autonomic dysfunction to normal subjects from our database.

11 patients (age: 66±9.4 y) were compared to normal values for the age-group 60-69y. Systolic and diastolic blood pressures (BP) and heart rates (HR) were calculated for 24-hours and for day and night time. Blood pressure and heart rate variability was expressed by standard deviations of individual measurements.

Mean value of AMBP was 131/80mmHg with HR of 75bpm in PD compared to 132/81mmHg with HR of 78bpm in controls. Day and night differences were 13.5/3.6mmHg and -1.8bpm in PD compared to -20.0/-13.0mmHg and -12.0bpm in controls. Standard deviations of BP and HR during the day were 24.8/14.2mmHg and 8.7bpm in PD compared to 16.8/11.7mmHg and 17.0bpm in controls. In PD standard deviations were lower for systolic ($p=0.001$) and diastolic ($p<0.0001$) BP and for HR ($p=0.32$) at night. The variability in blood pressure is high during the day and the mean level increases at night in PD which could be ascribed to a combination of defect baroreceptor function and variability in cardiac preload during postural changes. Increased cardiac preload and BP during the night could explain the nycturia and sleep disturbances seen in the clinic.

P2553

Fatal case of acute pandysautonomia associated with sensory neuronopathy and small cell lung cancer

A. Dolgan, J. Chojdak-Lukasiewicz, S. Budrewicz, M. Koszewicz, K. Słotwiński
Department of Neurology, Wroclaw Medical University, Wroclaw, Poland

Introduction: Subacute sensory neuronopathy (SSN) is regarded as a classical paraneoplastic neurological syndrome (PNS) and is mostly associated with small cell lung cancer (70-80%). PNS are rare, affecting less than 1/10,000 patients with cancer.

The best way to diagnose PNS is to identify one of the well-characterized anti-onconeural protein antibodies in the patient's serum (specificity >90%) .

Case report: We report a 60-year-old woman who developed dysesthesia in all extremities with severe loss of deep sensation over a few months. Neurological examination revealed severe numbness and deep sensory disturbance of extremities and body, weakness of distal extremities absence of deep reflexes, limbs' ataxia. Nerve conduction velocities showed pure sensory polyneuropathy. Cerebrospinal fluid analysis revealed elevated protein concentration. Positive anti-Hu and anti-Yo antibodies were found in the serum. Chest X-ray was normal but thoracic computer tomography (CT) scan showed a small mass in the upper mediastinum. Patient's condition deteriorated during hospitalization, disturbances of consciousness occurred. She developed hypotonia and abdominal pain with severe diarrhoea, which led to electrolytes imbalance. Then lung inflammation with high fever and anaemia occurred. After performed bronchoscopy she developed acute respiratory failure and despite resuscitation she died 6 months after recognition. Autopsy revealed small cell lung cancer.

Conclusions: Paraneoplastic sensory neuronopathy syndrome occurrence concomitant with acute pandysautonomia is very rare (only few reports in the literature). The authors indicate to the meaning of early recognition which may be the only means to prevent severe neurologic disability.

P2554

The cardiac autonomic function in patients with ankylosing spondylitis: a hospital cohort study

C.-Y. Wei[1], J.C.-C. Wei[2]
[1]Nerological Department, Chang Bing Show Chwan Memorial Hospital, Changhua, [2]Division of Allergy, Immunology and Rheumatology, Chung Shan Medical University, Taichung, Taiwan R.O.C.

Objective: Ankylosing spondylitis (AS) is a chronic systemic inflammatory disease. The primary aim of this study is to investigate the autonomic nervous system (ANS) function in AS patients. The secondary aim is to analysis the associations between ANS and the functional status or disease activity.
Material and methods: The study includes 42 AS patients all fulfilling the modified New York criteria. The AS patients and 230 healthy volunteers receive analysis of five minutes heart rate variability (HRV) in lying posture. In addition, these AS patients are assessed in biochemical data and questionnaires including Bath Ankylosing Spondylitis Disease Activity Index (BASDAI), Bath Ankylosing Spondylitis Functional Index (BASFI) and Bath Ankylosing Spondylitis Global Score (BAS-G).
Results: Although the HRV analysis indicates that the peaks of total power (TP, 0-0.5Hz) and high-frequency power (HF, 0.15-0.40Hz) are similar in both groups, the activities of low frequency power (LF, 0.04-0.15Hz), LF in normalised units (LF%) and the ratio of LF to (LF/HF) in AS patients are obviously lower than in healthy people. The erythrocyte sedimentation rate (ESR) revealed negative relationship with LH, TP and HF. The C-reactive protein (CRP) levels also showed negative relationship with HF. The AS patients without uveitis have higher LF and TP than the patients with uveitis. The total scores of BASDI, BASFI and BAS-G do not show any association to HRV parameters.
Conclusion: AS patients have abnormal cardiac autonomic regulation which may be closely related with inflammatory activities and one of the factors of a high cardiovascular risk.

P2555

Anxiety, depression and cardiac autonomic dysfunction in hypertension

Z. Bajkó[1], C.C. Szekeres[2], K.R. Kovács[3], K. Csapó[3], S. Molnár[3], P. Soltész[4], L. Csiba[3]
[1]Neurology, University of Medicine and Pharmacy, [2]Neurology, Mures County Clinical Emergency Hospital, Targu Mures, Romania, [3]Neurology, [4]Internal Medicine, University of Debrecen, Medical and Health Science Centre, Debrecen, Hungary

Introduction: Epidemiological studies suggested that anxiety and depression may be a risk factor for cardiovascular diseases. The pathophysiological mechanisms accounting for this association could be the impaired autonomic regulation of the heart.
Objectives: This study examined the relationship between autonomic nervous system dysfunction, anxiety and depression in untreated hypertension.
Patients and methods: 86 recently diagnosed hypertensive patients and 98 healthy volunteers were included in the study. The majority of hypertensives were diagnosed in cardiovascular screening programs. The psychological parameters were assessed with Spielberger State-Trait Anxiety Inventory and Beck Depression Inventory by a skilled psychologist. Autonomic parameters were examined during tilt table examination(10min lying position, 10 minutes passive tilt). Heart rate variability was calculated with autoregressive method. BRS was calculated with non-invasive sequence method from the recorded beat-to-beat blood pressure values and RR intervals.
Results: Significantly higher state (42.6±9.3 vs. 39.6±10.7 $p=0.05$) and trait (40.1±8.9 vs. 35.1±8.6, $p<0.0001$) anxiety scores were found in the hypertension group. There was no difference in the depression level. LF-RRI of HRV in passive tilt (377.3±430.6 vs. 494.1±547, $p=0.049$) and mean BRS slope (11.4±5.5 vs. 13.2±6.4, $p=0.07$) in lying position were lower in hypertensives. Treat anxiety score correlates significantly with sympatho/vagal balance (LF/HF-RRI) in passive tilt position (Spearman $R=-0.286$, $p=0.01$).
Conclusions: Despite the recent diagnosis the autonomic parameters in the hypertension group suggested a long-standing disease. Anxiety could play a more important role than depression in the development of hypertension. Altered autonomic control of the heart seems to be one of the pathophysiological links between hypertension and psychological factors.

P2556

Episodic spontaneous hyperhidrosis with low body temperature: a variant of Shapiro's syndrome

Y. Roh, H.-J. Moon, J.-H. Jeong, S.-H. Park
Department of Neurology, Seoul National University Bundang Hospital, Seongnam, Republic of Korea

Introduction: Attacks of hyperhidrosis and hypothermia have been rarely observed in association with some neurological syndromes such as agenesis of the corpus callosum (Shapiro's syndrome). We present a patient with episodic hyperhidrosis and hypothermia following the traumatic destruction of the anterior corpus callosum.

Case report: A 63-year-old man was transferred to our hospital with a sudden onset of unresponsiveness. His eyeballs were mildly deviated upward although the patient showed no abnormal posturing or seizure-like movements. He was diagnosed with non-convulsive status epilepticus with dramatic response to the administration of lorazepam. During the course of admission, three episodes of spontaneous hyperhydrosis and hypothermia (axillary temperature: 34.1°C) accompanied by profuse sweating were observed. Laboratory findings including hormone levels were all normal. The patient explained that similar episodes had begun 2 years ago, 1 year after the surgical intervention of the cerebellar haemorrhage. These episodes lasted several hours to days and spontaneously resolved with a frequency of at least once per several months. MRI scans demonstrated a tract-like lesion from the right frontal cortex through the right anterior corpus callosum as well as tissue loss in both cerebellar hemispheres as a result of a previous cerebellar haemorrhage and surgical evacuation. This lesion is most likely due to insertion of an extraventricular drainage catheter to the right lateral ventricle.

Conclusion: It is possible that injury to the anterior corpus callosum might be the cause of the episodic hyperhidrosis and hypothermia, although the role of thermoregulation of this area remains to be elucidated.

P2557

The factors that influence the outcome of NEUROPAD test in patients with diabetes mellitus

M. Manigoda[1], J. Martinovic[2], T. Manigoda[3], S. Drobnjak[4], V. Mitrovic[4], A. Nikolovski[5], S. Ristic[5], S. Petkovic[1]
[1]Neurology, Health Centre 'Dr.Ristic', [2]Laboratory, Belgrade Clinical Centre, [3]Radiology, Zvezdara University Hospital, [4]Endocrinology, [5]General Medicine, Health Centre 'Dr.Ristic', Belgrade, Serbia

NEUROPAD test was recently recognized as simple test for detection of sudomotor nerve fibres dysfunction in patient with diabetes mellitus. Aim of our study has been to find out which of the below mentioned factors significantly influence the outcome of the test. In 39 patients with diabetes NEUROPAD test. The following factors were analysed in each patient: age, duration of diabetes, last measured values of HbA1c and blood glucose, presence or absence of other diabetic complications, value of NTSS-6 score. A general linear model analysis of variance was used to compare differences in parameters between patients with positive and negative NEUROPAD test results and binary logistic regression was used to seek possible independent association between NEUROPAD test results and factors such as age, DM duration, glucose level and different pathological conditions. The general linear model showed general significant differences between positive and negative patients (p=0.032). At the partial level, patients with positive NEUROPAD test were significantly older (p= 0.020) and had higher NTSS-6 values (p=0.049). The binary logistic regression indicated that age (p=0.045; OR=1.346) was significant predictor for positive test outcome. Also, according to omnibus tests of model coefficients we observed that impact of investigated factors when they appear simultaneously were significant (p=0.006). The NEUROPAD test was significantly more positive than negative. The outcome of the test was influenced by age and NTSS-6 score. The age of patients of predictor of positive outcome. The impact of investigated factors was significant when they appeared simultaneously.

P2558

Unilateral segmental hyperhydrosis revealing a pulmonary tumour

H. Derbali, S. Sayhi, B. Benamou, L. Rais, J. Zaouali, R. Mrissa
Hopital Militaire Primaire d'Instruction, Tunis, Tunisia

Introduction: Localized unilateral hyperhydrosis is a rare, but well defined sweating disorder usually reported in association with organic nervous system disease including vascular cerebral accident, spinal cord disease and peripheral neuropathy. Its association with thoracic malignant tumours is a rare occurrence
Observation: We report a 65-year-old smoking man with a history of a post-traumatic right cubital nerve compression. He complained of paroxysmal hyperhydrosis involving the right hemiface associated with deep continuous ache of the right shoulder, the upper hemithorax and the arm. He also complained of a right C8-D1 neuralgia with weakness, coldness and paraesthesia of the right hand. Neither cervicalgia nor sphincter disorders were reported Chest radiography found an abnormal opacity at the apex of the right lung CT scan confirmed this finding.
Biopsy specimen: poorly differentiated adenocarcinoma.
Conclusion: Localized unilateral hyperhydrosis is a rare disorder most commonly due to neurological diseases.
However, other origins such as tumoral lesions involving the sympathic trunk must be raised for an early diagnosis and prompt assessment.

P2559

Electrophysiological sensory demyelination in typical chronic inflammatory demyelinating polyneuropathy

S. Samarasekera, Y. Rajabally
Neurology and Neurophysiology, University Hospitals of Leicester, UK

Background: The presence of electrophysiological demyelination of sensory nerves is not routinely assessed in the evaluation of suspected chronic inflammatory demyelinating polyneuropathy (CIDP). Whether this can be useful is unknown.
Methods: Surface recording techniques were used in 19 patients with typical CIDP and 26 controls with distal large fibre sensory axonal neuropathy to compare:
forearm median sensory conductions, sensory nerve action potential (SNAP) amplitudes and durations and sensory nerve conduction velocities (SNCVs) of median, radial and sural nerves.
Results: Median nerve sensory conduction block (SCB) across the forearm was greater in CIDP patients than in controls ($p=0.005$). SNAP durations were longer in CIDP patients for median ($p=0.001$) and sural nerves ($p=0.004$). Receiver operating characteristic (ROC) curves provided sensitive (>40%) and specific (>95%) cut-offs for median nerve SCB as well as median and sural SNAP durations. SNCVs were significantly slower for median and sural nerves in CIDP patients, but ROC curves did not demonstrate cut-offs with useful sensitivities/specificities. Median SCB or prolonged median SNAP duration or prolonged sural SNAP duration offered a sensitivity of 73.7% for CIDP and specificity of 96.2%. Used as additional parameters, they improved diagnostic sensitivity of the American Academy of Neurology (AAN) criteria for CIDP of 1991, from 42.1% to 78.9% in this population, with preserved specificity of 100%.
Conclusions: Sensory electrophysiological demyelination is present and may be diagnostically useful in typical CIDP. SCB detection and SNAP duration prolongation appear to represent more useful markers of demyelination than SNCV reduction.

P2560

Effects of theta burst stimulation on cerebral vasomotor reactivity

S. Bek, T. Kasikci, M. Korkmaz, I. Uysal, S. Demirkaya, Z. Odabasi
Gulhane Medical Academy, Ankara, Turkey

Objective: Theta burst stimulation (TBS) which was introduced in 2005, is an alternative form of repetitive transcranial magnetic stimulation (rTMS) at high or low frequencies. Our aim was to evaluate the effects of TBS on cerebral vasomotor reactivity (VMR).
Methods: The study included 10 healthy volunteers (age 21.60±1.65). Magnetic stimulation was applied to the motor cortex. The study was done in two days. First day the intermittent TBS (iTBS) consisting of 600 pulses was applied, and after 24 hours continuous TBS (cTBS) consisting of 600 pulses was applied. Cerebral vasomotor reactivity was evaluated by means of breath-holding index (BHI) before and after application of TBS at 0-15-30-60 minutes.
Results: At first phase which was applied in first day, before application BHI was determined 1.76±0.71, 0min 1.69±0.52 ($p>0.05$), 15min 1.66±0.72 ($p>0.05$), 30min 1.59±0.56 ($p=0.05$), 60min 1.71±0.75 ($p>0.05$). At second phase 24 hours later, BHI was determined before application 1.93±0.55, 0min 1.73±0.57 ($p<0.05$), 15 min 1.85±0.56 ($p>0.05$), 30min 1.78±0.45 ($p>0.05$) and 60 min 1.95±0.57 ($p>0.05$).
Conclusion: As a result of this study, some temporary changes have occurred in early period after TBS but these changes disappeared in about 1 hour. Consequently iTBS or cTBS applications do not change VMR and can be confidently used as a therapeutic strategy for stroke patients.

P2561

Combined quantitative and neurophysiological sensory assessment reveals differences in spino-thalamic function within cervical and trunk dermatomes

J. Haefeli[1], J. Blum[1], J. Kramer[2], A. Curt[1]
[1]Spinal Cord Injury Center, Zurich, Switzerland, [2]ICORD, Vancouver, BC, Canada

Introduction: Current examination of spino-thalamic tract function following spinal cord injury (SCI) is mainly limited to quantitative sensory testing. Contact heat evoked potentials (CHEPs) in combination with thermal threshold testing might be a way to improve the assessment of segmental sensory function. Hence, this study aimed to investigate sensory segmental characteristics of warmth and nociceptive heat perception and CHEPs within different cervical and trunk dermatomes.
Methods: In 19 healthy subjects (mean age 45.2±18.3) the perception threshold, pain threshold and combined CHEPs and pain rating were examined. Five different segments (C4, C5, C6, C8 and T4) according the ASIA dermatomes were stimulated with two different temperatures (52ºC and individual pain threshold plus 3ºC).
Results: Perception thresholds of warmth showed no differences between the dermatomes while pain threshold and pain rating to heat were significantly different between dermatomes. In the cervical dermatomes C6 and C8 pain ratings were reduced and pain thresholds increased ($p<0.05$) which related to reduced CHEPs amplitudes. CHEPs latencies were significantly ($p<0.05$) longer for more distal segments.
Discussion and conclusion: The combined quantitative and neurophysiological sensory assessment revealed significant differences of sensory function between cervical and trunk dermatomes. The diverse responses to heat stimulation are most likely due to differences in receptor densities. These differences among segments should be concerned when investigating the sensory function of the spinothalamic tract. CHEPS as a segmental sensitive tool could complete the clinical testing of sensory thresholds to improve the assessments of the spino-thalamic tract in SCI.

P2562

Fixation optokinetic nystagmus in diagnosis of vestibular dysfunction

K. Karalevich
Neurology Department, National Research Center of Neurology and Neurosurgery, Minsk, Belarus

Background: Nystagmus reaction appearing at optokinetic stimulation and fixation by gaze of immobile point is still not understood.
Objective: Our goal was to determine whether this reaction is spontaneous nystagmus (SN) or the other kind of nystagmus (fixation optokinetic nystagmus – FOKN)
Methods: We examined 50 healthy subjects and 31 patients with vestibular neuronitis (VN) in 10 days after disease beginning. They had not SN (in acute stage they had SN). We assessed direction and size of FOKN, vestibulo-ocular reflex suppression (VORS) and SN in these groups.
Results: Unilateral FOKN appeared in 23 healthy subjects. These patients had incomplete VORS, but not pathological; the gain (eye velocity divided by head velocity) was 0.069±0.002. The direction of unilateral FOKN coincided with incomplete VORS direction. In the 27 healthy subjects FOKN did not appear, VORS was complete, the gain was 0.02±0.001. In patients with VN unilateral FOKN in appeared by 31 subjects. The direction of FOKN and SN in acute stage coincided in 15 patients and not coincided in 16 patients. VORS was complete, the gain was 0.03±0.001.
Conclusion: The infringement of VORS is a symptom of brain lesion. In the 27 healthy subjects incomplete VORS appeared, which coincided with the FOKN direction. The FOKN and SN did not coincide in acute stage in the 16 VN patients. Our results give evidence that these symptoms are not pathological, but are displays of fixation instability of a gaze. FOKN is an independent nystagmus and its direction does not coincide with SN direction.

P2563

Abstract cancelled

P2564

Scalp recorded DC potentials as electrophysiological correlates of rCBF in patients with vascular encephalopathy

V. Fokin[1], N. Ponomareva[1], M. Krotenkova[2], R. Konovalov[2], M. Tanashian[2], O. Lagoda[2]
[1]Brain Research Department, [2]Research Center of Neurology, Moscow, Russia

Introduction: Dual nature of scalp recorded DC potentials has been suggested. The potentials generated by blood brain barrier and neuronal potentials were found to be the sources of the scalp recorded DC potentials (Voipio et al., 2003). Therefore DC potentials parameters may depend on rCBF.
Aim: To determine whether scalp recorded DC potentials are related to the characteristics of rCBF in patients with vascular encephalopathy (VE).
Methods: DC potentials and rCBF were investigated in 40 patients with VE. DC potentials were registered from head using 12 Ag/AgCl electrodes placed according to the 10-20 system with reference on the right wrist. Standard characteristics of computed tomography perfusion (CBV, CBF, MTT, TTP) were measured in different areas of cortex, basal ganglia and thalamus.
Results: Significant correlations ($p<0.01$) were found between DC potentials in central electrode position (Cz) and CBV, CBF parameters in frontal, temporal cortex and basal ganglia. Low significant correlation ($p<0.05$) was found between DC potentials and CBF in thalamus. Interhemispheric differences of rCBF in frontal, temporal and parietal cortex correlated with the differences of DC potentials in corresponding electrode positions.
Conclusion: Scalp recorded DC potentials correlate with CBV and CBF in different areas of the brain. The results support the hypothesis of vascular origin of DC potentials.

P2565

The effect of long-term use of computer mouse devices on the median nerve entrapment

F.H. AL-Hashem
Physiology Department, College of Medicine, King Khalid University, Abha, Saudi Arabia

Objective: To assess the effect of long term use of computer mouse devices on the median nerves.
Subjects and methods: A cross-section prospective study conducted during the year 2004, involving 41 male secretaries employed in the Health Colleges of King Khalid University in Abha. A questionnaire describing sociodemographic and computer use was completed. The electrophysiological study included measurements of motor latencies, motor conduction velocities (MCVs) and amplitudes of compound muscle action potential of the right median nerve and compared with those of the left median nerve (control) (all of our subjects are right handed). Terminal latency index (TLI) was calculated for each nerve tested. Entrapment neuropathy of the median nerve at the wrist was defined as TLI <0.30.
Results: The mean TLI of the median nerve in the right hand was significantly lower than that in the left hand. 8 of the 23 asymptomatic participants (34.8%), 6 of the 12 who reported hand discomfort (50%) and all 6 participants who met clinical criteria for CTS showed electrophysiological evidence suggestive of right median nerve entrapment neuropathy at the wrist. Test of association showed a negative and significant correlation between TLI of the right median nerve and weekly hour's mouse device use while no significant correlation was found between TLI in the same hand and weekly hour's keyboard use.
Conclusion: Frequent computer mouse device users are at high risk of developing median nerve entrapment neuropathy at the wrist.

P2566

Abstract cancelled

P2567

Horizontal ocular movement disorder in the chronic stage of organoarsenic poisoning

K. Nakamagoe, K. Ishii, A. Tamaoka,
Department of Neurology, Institute of Clinical Medicine, University of Tsukuba, Japan

Aim: To ascertain the chronic effects of organoarsenic compounds on the central nervous system, we focused on abnormal ocular movement such as saccadic intrusions.
Introduction: During the Second World War, the Imperial Japanese Army manufactured and stored several thousand tons of chemical weapons. Among the weapons were agents commonly known as "red shells," which induce sneezing and nausea. When the main components are hydrolyzed, diphenylarsinic acid (DPAA) is synthesized. About 60 years after the war, water contaminated with the organoarsenic compound DPAA was discovered in Japan. In 2003, during the acute poisoning phase, victims exhibited neurological abnormalities such as cerebellar symptoms and abnormal ocular movement. By 2006, daily life activities had improved for all subjects and were almost normal. However, 36% of subjects experienced dizziness and light-headedness.
Methods: The subjects were 39 individuals among whom organoarsenic compounds were detected from body samples. All subjects were last exposed to contaminated well water in 2003, and they were examined between 2006 and 2008. The subjects' ocular movements were closely analyzed using electronystagmography, and we analyzed the relationship between DPAA concentrations and the occurrence of square-wave jerks (SWJ).
Results: SWJ was confirmed in 56% of all subjects. The duration of SWJ increases linearly relative to DPAA concentrations in nails. The correlation was significant (r=0.54). There is also a linear relationship between frequency and DPAA concentration in nails. The correlation was significant (r=0.70).
Conclusion: SWJ is shown to be an important biomarker for brain damage caused by organoarsenic compounds.
This research was conducted by the Japanese Ministry of the Environment: DIFENIRUARUSINSANTOU NO KENKO-EIKYO NI KANSURUCYOSA-KENKYU (research on the Influence of Diphenylarsinic Acid and Related Compounds on Human Health)

P2568

Recurrent vestibulopathy: natural course and prognostic factors

R.B. van Leeuwen[1], T.D. Bruintjes[2]
[1]Neurology, [2]ENT, Gelre Hospital, Apeldoorn, The Netherlands

Background: Recurrent vestibulopathy is a clinical syndrome which was first described by Leliever and Barber in 1981. It consists of multiple episodes of vertigo lasting for minutes to hours without auditory or neurological signs and symptoms. The attacks are not provoked by changes in head position. The cause of recurrent vestibulopathy is not known.
Objective: Evaluation of the natural course of recurrent vestibulopathy. Study design: A retrospective analysis.
Patients: 105 adult patients with attacks of vertigo without auditory or neurological symptoms. All subjects underwent a full neuro-otological evaluation, including ocular motor testing, positional testing, caloric and rotational testing, as well as pure tone audiometry.
Methods: A structured interview was conducted over the telephone 12-62 months after the first visit to the outpatient department. This method of follow-up by telephone was validated. In case of hearing loss or positional vertigo the patient was seen at the outpatient department and pure tone audiometry and/or vestibular testing was performed.
Results: Two thirds of the patients experienced a spontaneous resolution of vertigo, one third continued to have symptoms. In 2% of the patients the diagnosis was changed into migraine, in 1% into Menière's disease.
Conclusion: In our opinion recurrent vestibulopathy should be seen as a clinical syndrome of unknown etiology. The prognosis of recurrent vestibulopathy is good. In a few cases the diagnosis is a provisional one and has to be changed at some time into migraine or Menière's disease.

P2569

Colour Doppler imaging findings in retinal venous obstruction

D.C. Jianu[1], S.N. Jianu[2], D.F. Muresanu[3], M. Petrica[4], M. Serpe[5]
[1]Neurology, University of Medicine and Pharmacy 'Victor Babes', [2]Ophtalmology, Emergency Military Hospital, Timisoara, [3]Neurology, University of Medicine and Pharmacy 'I. Hateganu', Cluj-Napoca, [4]Neurology, Emergency County Hospital, Timisoara, [5]Neurology, Municipal Hospital, Lugoj, Romania

Background: Central retinal vein obstruction (CRVO) is found most commonly in individuals over 50 years. Diabetes mellitus, systemic arterial hypertension, and atherosclerotic cardiovascular disease are the most frequently associated underlying medical diseases.
Purpose: To assess the role of CDI of retrobulbar vessels in the study of 23 patients with central retinal vein obstruction.
Methods: We have used a sonographer with 9MHz linear probe.
Results: We found low flow velocities in the central retinal vein, and a light modulation with cardiac cycle, both in ischemic and non-ischemic type of central retinal vein obstruction. Flow velocities in ophthalmic artery varied from normal to low, in correlation with carotid artery stenoses. The resistance index in central retinal artery is the only parameter correlated with vein obstruction.
Conclusions: Ultrasound investigation is a valuable diagnostic tool for identifying potential systemic conditions associated with CRAO, such as carotid stenosis.

P2570

Long-term follow-up of patients with benign paroxysmal positional vertigo

C.-S. Shin
Neurology, Suhgwang General Hospital, Gwangju, Republic of Korea

Objectives: Vestibular symptoms of vertigo, dizziness and dysequilibrium are common complaints which can be disabling both physically and psychologically. To estimate recurrence in the long-term follow-up of patients with benign paroxysmal positional vertigo (BPPV) after successful canalith repositioning manoeuvres, and to determine which factors contribute to recurrence.
Methods: The charts of 100 patients with BPPV were reviewed. Data of patients were recorded from the initial evaluation and treatment. Follow-up was performed at mean of 36±5.2 months after the initial phase. All subjected patients were examined using video-nystagmography (VNG) and brain MRI for diagnosis, and all patients were treated by the canalith repositioning manoeuvre, which was repeated every 3 days until the patients were symptom-free or results of the VNG were negative.
Results: At diagnosis, the most common etiology was idiopathic in 55 patients (55%). Recurrence occurred in 28 of 100 patients (28%). Recurrence occurred within the first year in 11 of the 28 patients (39.3%). History of head trauma was a more frequent finding in patients who developed recurrence (8 of 28, 28.6%).
Conclusions: Recurrence of benign paroxysmal positional vertigo (BPPV) developed in one-third of patients when followed for an average of 3 years from diagnosis. History of head trauma and Menière's disease contributed significantly to recurrence ($p < 0.05$). History of head trauma as an etiologic cause was more frequent in patients with recurrence of BPPV.

P2571

Mechanism of rotational vertebral artery syndrome: tips from compression of the vertebral artery terminating as PICA

Y. Roh[1], O.-K. Kwon[2], S.-H. Park[1], J.-S. Kim[1]
[1]Department of Neurology, [2]Department of Neurosurgery, Seoul National University Bundang Hospital, Seongnam, Republic of Korea

Introduction: Rotational vertebral artery syndrome (RVAS) is characterized by recurrent attacks of paroxysmal vertigo, nystagmus, and ataxia induced by head rotation. We report on a patient who developed RVAS due to compression of the vertebral artery (VA) terminating as posterior inferior cerebellar artery (PICA).
Case report: A 59-year-old man was consulted for recurrent vertigo. When he rotated his head to the left side, he developed vertigo and nystagmus with a latency of 5-6 seconds. The nystagmus was mainly downbeat with rightward and clockwise torsional component. Magnetic resonance angiograph (MRA) showed hypoplastic right VA terminating as PICA without connection to the basilar artery. The basilar artery received its flow from the left VA only. Insonation of transcranial Doppler revealed markedly decreased flow velocity of right PICA with minimal waves during rotation of the patient's head to the left side. Conventional angiography confirmed the findings observed on MRA and additionally showed both anterior inferior cerebellar arteries originating from the basilar artery. Dynamic angiography revealed complete occlusion of the right distal VA at the level of C1-2 junction while the patient turned his head to the left side. In contrast, the blood flows through the left vertebral and basilar arteries remained intact while head turning to either side.
Conclusion: Previous reports have debated on the mechanism of vertigo and nystagmus in RVAS. The hemodynamic changes observed in our patient with RVAS indicate that isolated vertigo and nystagmus from vascular compromise may occur due to transient ischemia of the inferior cerebellum or lateral medulla.

P2572

Interhemispheric brain changes at sensoneural hearing loss

T. Drozdova
Stavropol Hospital, Stavropol, Russia

Reduced quality of life for people exposed to complex influence of production factors determines the relevance of studying the pathogenesis of sensoneural hearing loss (SHL) from the position of cerebral homeostasis changes. The investigation involved 3 groups (187 men) and included 133 locomotive drivers and their assistants; 51 of them (main group) had degree one of SHL according to the international classification, the comparison group consisting of 82 people had normal hearing. The control group consisted of 54 men. The indices of interhemispheric coherence's (IHC) average levels were estimated for 8 pairs of symmetrical leads of EEG background recording.

Conclusions:

1. Interhemispheric coherence reduction is more expressed in the main group and is the most typical for central, parietal, post-temporal and F3F4 leads.
2. The rise of IHC along with increase of work experience takes place in the comparison group. IPC are equal for people with work experience up to 15 and more than 25 years in the main group.
3. Maximum decrease of interhemispheric interaction was investigated in the range of beta 2-activity in comparison group; but the IHC reduction along with work experience increase takes place in the range of beta1 activity in the main group.
4. IHC changes, typical for initial presentation of SHL of locomotive workers, are most relevant for men with work experience up to 20 or more than 25 years. So, the diagnostically relevant changes in brain interhemispheric interaction during initial SHL were defined.

P2573

Aetiologies of inflammatory pseudo-tumours of the orbit

D. Zemmour, D. Hakem, A. Berrah
Internal Medicine, Dr. Mohammad-Lamine Debaghine's Hospital, Bab El Oued Universitary Hospital Center, Algiers, Algeria

Introduction: Inflammatory pseudo-tumours of the orbit (IPTO) reveal or complicate numerous disorders (Grave's disease, granulomatosis, infectious process etc.). Its impose exclusion of oculo-cerebral lymphoma.

Patients and methods: Study from January 2000 until January 2009 in Internal Medicine Department, collecting IPTO excluding infectious diseases and Grave's diseases.

Results: 9 Women, 4 men, median age 37 years. Medical history observed, there are severe late asthma (2), type 2 diabetes (1), and hypertension (2). Exophtalmia is unilateral (6) with a ptosis (3), a palpebral oedema (5), neuralgia of V (2) and a scleritis (3). Imaging reveals an infiltrative mass more or less heightened by the contrast agent and a thickening of the sclera. Diagnoses retained on histological and immunological arguments (9) are Wegener granulomatosis (3), sarcoidosis (2), lymphoma (1), Gougerot Sjögren Disease (2), Churg-Strauss disease (1), Tolosa Hunt (1), Means syndrome (1), Horton Disease (1) and xanthogranulomatosis (1). Evolution is enamelled by an ischemic ophthalmoneuritis (1), a respiratory distress syndrome (1), a contralateral recurrence (3), a monophtalmia (1). Treatment is aetiological and based in corticosteroides and immunosuppressive drugs (11), chemotherapy (1) and thyroidectomy (1).

Conclusion: IPTO reveals diverse disorders of variable prognosis imposing the exclusion from a primitive malignant process (lymphoma, retinoblastoma) even metastatic and of an infectious etiology (tuberculosis, locoregional infection). Rarely IPTO inaugurates a systemic disease.

P2574

Optic neuropathy after influenza vaccination in a patient with rheumatoid arthritis

A. Tzoukeva, N. Deleva, A. Kaprelyan
Neurology, Medical University Prof. Dr. P. Stoyanov, Varna, Bulgaria

Objective: To report the occurrence of optic neuropathy following influenza vaccination in a patient with rheumatoid arthritis.
Design: Observational case report and review of literature.
Methods: Description of medical history, neuroophthalmological examination, neuroimaging, fluorescein angiography and follow-up.
Case report: A 56-year-old female with long-lasting rheumatoid arthritis undergoing regular supported treatment, noted an inferior altitudinal defect in the visual field of the left eye (OS), 3 days after influenza vaccination. The fundus study revealed 2-3 diopters oedematous optic disc, worse segmentally superiorly OS. A diagnosis of optic neuropathy was made. Despite intravenous application of methylprednisolone, her vision progressively worsened over several days to 20/300 OS. Ten days later, visual acuity OS started to improve and after one month neuroophthalmological examination showed partial visual recovery (20/70). One year later visual acuity was 20/40 OS with pale optic disc in the affected eye.
Conclusion: Optic neuropathy following influenza vaccination in patient with rheumatoid arthritis has not been found in literature. There are isolated reports describing an evidence of an association between the vaccination and increased rheumatic or autoimmune disease activity and rare cases of anterior ischemic neuropathy as secondary manifestation in rheumatoid arthritis patients. We speculate that the present case suggests a possible link between ischemic optic neuropathy and influenza vaccine in an immunocompromised by rheumatic disease or this patient's treatment.

P2575

Cardiovascular autonomic instability during acute phase of ischaemic stroke

A. Piatek, M. Miller, M. Krakowska, J. Lorenc, A. Ferens, M. Tutaj, A. Szczudlik, A. Slowik
Department of Neurology, Jagiellonian University Medical College, Krakow, Poland

P2576

RR interval variation and the sympathetic skin response in the assessment of autonomic function in patients with Guillain-Barré syndrome

H. Ulvi, R. Aygul, G. Özdemir, A. Ertekin, L. Özel
Atatürk University, Erzurum, Turkey

P2577

Using the head-up tilt test as measured by the EMG to assess the ANS function

R. Yiğiter[1], H. Ulvi[2]
[1]Gaziantep Univerciti, Gaziantep, [2]Atatürk University, Erzurum, Turkey

P2578

Evaluation of RR interval variation in migraineurs

A. Milanlioglu, T. Tombul
100 Yıl University, Van, Turkey

P2579

Comparison of specificity and sensitivity of evoked potentials and brainstem reflexes in the diagnosis of brainstem death

Y. Hatanaka[1], M. Sonoo[1], K. Nishiyama[1], T. Shimizu[1], T. Nakatani[2], T. Sakamoto[2]
[1]Neurology, [2]Trauma and Critical Care Center, Teikyo University, Tokyo, Japan

P2580

Abstract cancelled

P2581

Evaluation of the peripheral intranodal sodium channels in Behçet's disease

G. Genc, S. Bek, O. Oz, U.H. Ulas, S. Demirkaya, Z. Odabasi
Gulhane Medical Academy, Ankara, Turkey

P2582

Registration of the resonance of tremor

A.V. Boika[1], K.N. Kapleuski[2], V.V. Ponomarev[3]
[1]2nd Neurological, 5 City Clinic, [2]Belarussian State University, [3]5 City Clinic, Minsk, Belarus

P2583

Abstract cancelled

P2584

Conversion disorder versus stroke: a difficult differential diagnosis

M.C. Pires[1,2], L. Nunes[3], J. Castro[2], R. Geraldes[2], P. Canhao[2,4], M. de Carvalho[2,4]
[1]Neurology, Hospital do Divino Espírito Santo, Ponta Delgada, [2]Neurology, Hospital de Santa Maria, Centro Hospitalar Lisboa Norte, EPE, Lisboa, [3]Internal Medicine, Centro Hospitalar de Torres Vedras, Torres Vedras, [4]Neurology, Faculdade de Medicina de Lisboa, Lisboa, Portugal

P2585

Brain mapping – interhemispheric EEG coherence in patients with neurotic symptomatology

V. Dakukina, M. Minzer, T. Dokoukina
Research Center for Mental Health, Minsk, Belarus

P2586

Prognostic value of itemized electroencephalographic features in neonates at neurological risk

M. Awadh[1,2], M.E. O'Regan[1]
[1]Fraser of Allander Neurosciences Unit, Royal Hospital for Sick Children, Glasgow, UK, [2]Neurology Department, Ain Shams University, Cairo, Egypt

P2587

Visual event related potentials in patients with mild cognitive impairment

E. Gozke, S. Tomrukcu, N. Erdal
Neurology, FSM Teaching and Research Hospital, Istanbul, Turkey

P2588

Modulation of cortical excitability during sleep and sleep deprivation in epileptic patients: a combined EEG-TMS study

A. Del Felice[1], V. Daloli[2], A. Fiaschi[2], P. Manganotti[2]
[1]Diaprtimento di Neurologia e Scienze della Visione, [2]Sezione di Neurologia Riabilitativa, Dipartimento di Scienze Neurologiche e Scienze della Visione, Università degli Studi di Verona, Italy

P2589

Similar neurophysiological alterations in elderly non-demented subjects with apolipoprotein E and apolipoprotein J/clusterin genotypes

N. Ponomareva[1], L. Shagam[2], S. Kunizheva[3], N. Cheglova[1], D. Malina[1], E. Rogaev[2,3,4]
[1]Brain Research, Research Center of Neurolopy RAMS, [2]Institute of General Genetic RAS, [3]Research Center for Mental Health RAMS, Moscow, Russia, [4]University of Massachusetts Medical School, Massachysetts, MA, USA

P2590

Variations in sympathetic skin response during menstrual cycle

D. Yerdelen
Neurology, Baskent University Faculty of Medicine, Adana, Turkey

P2591

New perspectives in understanding the relationship of polyneuropathy and spine: the whisper of cutaneous silent period

B. Isak[1], K. Uluc[1], B. Erbas[1], I. Aktas[2], T. Tanridag[1], O. Us[1]
[1]Department of Neurology, Marmara University Hospital, Department of Neurology, [2]Department of Physical Therapy and Rehabilitation, Saygı Hospital, Department of Physical Therapy and Rehabilitation, Istanbul, Turkey

P2592

Modulation of motor cortex excitability by different levels of whole-hand afferent electrical stimulation

S.M. Golaszewski[1,2], J. Bergmann[1], M. Christova[3], A. Kunz[1], Y. Krenn[1], E. Gallasch[3], W. Staffen[1], E. Trinka[1], G. Ladurner[1], R. Nardone[1,4]
[1]Department of Neurology and Neuroscience Institute, Paracelsus Medical University, Salzburg, [2]fMRI Lab, Department of Psychiatry, Medical University of Innsbruck, Innsbruck, [3]Department of Physiology, Medical University Graz, Graz, Austria, [4]Department of Neurology, F. Tappeiner Hospital, Meran, Italy

P2593

Ipsilesional horizontal saccadic palsy after pontine infarction

J.H. Kang, K. Park
Neurology, Jeju National University Hospital, Jeju, Republic of Korea

P2594

Ocular myasthenia gravis – pitfalls in clinical diagnosis

J. Lemos[1], L. Negrão[2]
[1]Neurology Department, [2]Coimbra University Hospital, Coimbra, Portugal

P2595

Brainstem lesions with torsional nystagmus

R. Cerny[1], J. Jerabek[1], J. Lisy[2], M. Bojar[1]
[1]Neurology, [2]Imaging Methods, Charles University, 2nd Medical School and Motol Hospital, Prague, Czech Republic

P2596

Susac's syndrome: study of two Tunisian cases

I. Ben Arbia, I. Abdelkefi, L. Raies, M. Farea, J. Zaouali, R. Mrissa
Neurology, Military Hospital of Tunis, Tunisia

P2597

Benign relapsing inflammatory optic neuropathy. Subtype of CRION?

J. Maletic, V. Tsirka, P. Ioannidis, N. Taskos
B Department of Neurology, AHEPA University Hospital, Aristotle University, Medical School, Thessaloniki, Greece

P2598

Carotid-cavernous fistulas of low-flow type: Colour Doppler imaging of retrobulbar vessels findings

D.C. Jianu[1], S.N. Jianu[2], D.F. Muresanu[3], S.M. Deme[4], S. Kory-Calomfirescu[3], M. Serpe[5]
[1]Neurology, University of Medicine and Pharmacy V Babes, [2]Ophtalmology, Emergency Military Hospital, Timisoara, [3]Neurology, University of Medicine and Pharmacy 'I. Hateganu', Cluj-Napoca, [4]Neurology, West University, Arad, [5]Neurology, Municipal Hospital, Lugoj, Romania

Infection and AIDS; critical care; neuro-traumatology; rehabilitation

P2599

Community acquired bacterial meningitis caused by viridans streptococci in the Buddhachinaraj Hospital during 1998-2008: a review of 94 cases

P. Sribussara, S. Rusmeechan
Medicine Department, Buddhachinaraj Hospital, Phitsanuloke, Thailand

Purpose: To study prevalence, clinical manifestations, cerebrospinal fluid findings and mortality rate related to community acquired bacterial meningitis caused by viridans streptococci.

Methods: This was a retrospective descriptive study by review of all community acquired bacterial meningitis caused by viridans streptococci in Buddhachinaraj Hospital from October 1998 to September 2008. The data were analyzed and presented in frequency and percentage.

Results: There were 94 cases in this study, 73 males and 21 females, 53.4% were immunocompetent and 43.6% were immonocompromised. Age ranged from 1 year to 103 years. Organisms had been isolated from CSF (79 cases, 84%) and blood (65 cases, 69.1%). Fever and headache were the most common symptoms. On admission, 71.3% of cases had neck stiffness, 58.5% were altering mental status and 8.5% had focal neurological abnormalities. In the majority of cases, CSF fluid revealed pleocytosis with predominant polymorphonuclear cells, but normal or marginally elevated CSF white blood cell could occur. Most of the cases had decreased CSF glucose levels below 40mg/dl and elevated protein levels. Hearing loss was found in 27.7% of the cases. The overall mortality rate was 17%.

Conclusions: Viridans streptococci are important causes of bacterial meningitis. The classic symptoms and signs may not be found in all cases. CSF usually abnormal but normal white blood cell count or normal glucose level may occur.

P2600

Improving speed of processing and everyday functioning in adults with HIV by using cognitive remediation therapy

D. Vance
School of Nursing, University of Alabama at Birmingham, Birmingham, AL, USA

Objective: Those aging with HIV are more vulnerable to cognitive and functional deficits. In this study, 52 middle-aged and older adults (mean age=51.5 years; range 40.7–70.6 years) with HIV were randomly assigned to a visual speed of processing training condition or a no-contact control condition to determine the effectiveness of this intervention.

Method: In the visual speed of processing training condition, participants received 10 hours of computerized visuo-cognitive exercises. At baseline and post-test, the following measures were administered: Useful Field of View (UFOV®) Test, Wisconsin Card Sorting Test, Finger Tapping Test, and the Timed Instrumental Activities of Daily Living (TIADL) Test.

Results: Controlling for baseline performance, ANCOVAs were used to examine treatment effects on these measures between the two groups at post-test. Treatment effects were detected on UFOV®, $F(2.40)=5.61$, $p=0.022$; the visual speed of processing training group improved on their UFOV® performance. Furthermore, transfer of training was observed on the TIADL Test, $F(2.37)=4.104$, $p=0.05$; the visual speed of processing group improved their speed and accuracy in performing these laboratory instrumental activities of daily living. Next, we examined the relationship between the cognitive measures and performance on the TIADL Test; only baseline ($r=0.52$, $p=0.001$) and post-test ($r=0.48$, $p=0.001$) UFOV® scores were significantly related to baseline and post-test TIADL performance, respectively.

Conclusions: This study emphasizes that computerized cognitive remediation therapy may benefit cognitive and everyday functioning in this growing population.

P2601

Predictors of neurocognitive functioning in adults with HIV

D.E. Vance[1], P.L. Fazeli[2], J. Marceaux[2]
[1]School of Nursing, [2]Psychology, University of Alabama at Birmingham, Birmingham, AL, USA

Objective: The aim of this study was to identify predictors of neuropsychological performance among adults with HIV.
Method: The sample included 98 HIV-positive adults with a mean age of 45.2. Participants completed psychosocial measures (Lubben Social Network Scale, Profile of Mood States, drug use) as well as neuropsychological measures of speed of processing (Useful Field of View, Complex Reaction Time Test, Digit Symbol Substitution), executive function (CLOX, Trails B), psychomotor ability (Trails A, Finger Tapping Test, Digit Symbol Copy), and memory (Digit Span, Spatial Span). Regression analyses were used to investigate predictors of neuropsychological performance. Step 1 of the analysis examined the effect of age and education quality (WRAT-3 Reading), and step 2 examined the effect of health factors on neuropsychological performance.
Results: Older age, poorer educational quality, mood problems and higher drug use predicted poor performance on several of the neuropsychological measures. The individual regression models for each of these measures explained 8-34% of the variability. Overall this study posits that among adults with HIV, the best predictors of neuropsychological deficits were older age and poorer quality of education. Additional predictors of cognitive deficits included mood problems and drug use. Health factors such as years diagnosed with HIV, and the size of one's social network were not found to be predictors in any of the models.
Conclusions: These results suggest that those aging with HIV are subject to decreases in cognitive functioning. Implications for clinical and research settings are provided.

P2602

Ultrasonography in ulnar neuropathy at the elbow: differences between entrapment and leprosy

M.R. de Freitas[1], A.A.V. de Carvalho[2], O.J. Nascimento[1], F. Bayão[1], F. Cardoso[3], T.M. Escada[1], M.T. Nevares[1], M.D. Hahn[4]
[1]Neurology, [2]Radiology, [3]Neurology Federal Fluminense University, [4]Pathology, Federal Fluminense University, Niterói, Brazil

We compare the cross-sectional area by ultrasonography (US) of the ulnar nerve at the elbow (CSA-M) and approximately 2cm proximal to this point (CSA-I) to differentiate ulnar palsy due to entrapment at the elbow (UNE) and ulnar palsy due to leprosy. UNE is the second most common entrapment neuropathy. US is an accurate and easily applied test for the diagnosis of UNE. In Brazil, where leprosy is endemic, the ulnar is the most frequently affected nerve. In pure neuritic form of leprosy (NFL), it is difficult to make the diagnosis between PNL and UNE as both cause ulnar nerve enlargement at the elbow.
The CSM-A and the CSM-I of the ulnar nerve were measured in 17 patients with UNE and 4 with NFL. The nerve conduction studies were performed. A biopsy of the dorsal sensory branch of the ulnar nerve was performed in the hand. Reference values were obtained in 47 healthy volunteers. In the controls the mean CSA-M and CSA-I was 6.75 and 6.14mm^2, respectively. In UNE the mean CSA-M was 14.6 and the mean CSA-I was 6.14. In ulnar nerve palsy due to leprosy the mean CSM-M was 13.5 and CSM-I was 12.5mm^2. In ulnar palsy due to PNL is enlarged at the elbow and above it and in UNE the is no thickness above the elbow, We conclude that US of the ulnar nerve at the elbow and 2cm above it is an accurate and easily applied test to differentiate UNE from PNL.

P2603

Burden of neuroinfectious diseases on the neurology service in a tertiary care hospital

V. Ashraf[1], C. Govind[2], R. Praveenkumar[2], P. Dhanya[2], A. Girija[2]
[1]Neurology Department, [2]Neurology, Malabar Institute of Medical Sciences, Calicut, India

Background: Neurologic infections have the potential to cause death and suffering. These disorders often go unrecognized or are misdiagnosed. We aimed to determine the burden of neurologic infections on the neurology service in a tertiary care centre and identify challenges in the diagnosis and treatment of these infections.
Methods: We studied prospectively all inpatients diagnosed with any neuroinfectious disease evaluated at Malabar Institute of Medical Sciences between January 2009 and December 2009. We recorded information on hospital admission, clinical features, microbiologic analysis, neuroimaging, EEG, pathology, treatment and outcome.
Results: A total of 121 of 1,820 patients admitted to or consulted on by neurology service were identified. 70% of patients were aged between 18 and 65 years. Mean age was 26 years. 12 patients were immunocompromised of which one patient had HIV infection. Overall 21 microbiological agents were identified. CSF PCR tests were done in 60 patients of whom 17 were positive. The most common causes were viral, followed by bacterial. Tuberculous etiology was found in 25 patients. Neuroimaging was done in 110 patients and was abnormal in 31 instances. Hospitalisation periods were long, with 35% of patients staying beyond 10 days. There was significant morbidity. 10% of patients required rehabilitation or long term care and 3% died.
Conclusions: Neurologic infections have a major socioeconomic impact because they result in prolonged hospitalizations, expensive diagnostic tests and treatments, and long-term debilitation or death in young patients. Though potentially curable conditions, the burden of undiagnosed infections remains high.

P2604

Clinicopathologic characteristics of Creutzfeldt-Jakob disease in Chile

L. Cartier, G. Quiroz, C. Vergara
Departamento de Ciencias Neurologicas Oriente, Universidad de Chile, Santiago, Chile

Chile has the highest incidence of Creutzfeldt Jakob Disease (CJD). Every year, at least 3 cases per million are identified, and familial forms represent more than 30% of all cases. The cases studied, were classified according to the CJD identification criteria by Parchi et al., who characterized different forms of the disease based on genetic, clinical, and neuropathological correlations. We intended to identify the prevalence of each form of CJD from a case series of 40 patients, followed clinically and with complete neuropathological study. We identified 13 areas in the central nervous system for semiquantitative histological analysis, measuring spongiosis, neuronal loss, and gliosis. An index of damage was thus obtained for each area studied. Clinically, we analyzed the evolution of behavioural changes, cognition, visual compromise, motor impairment and epileptiform activity. We begin with the premise that cerebral areas with the greatest damage should correlate clinically with evolution of neurologic symptoms in this disease. The correlation between clinical and neuropathological findings permitted us to classify cases of CJD into different forms. 5 clinical-pathologic forms were identified. 71.9% of classic form, 12.5% Heidenhain form, 9.4% ataxic form, and 3.1% precocious form and Kuru plaques form. There has not been a case of fatal familial insomnia or thalamic dementia described in Chile so far. We believe the clinical-pathologic profile of the Heidenhain form was different from the classic form. It is possible that the presence of many family forms result in a greater expression of classical forms and Heidenhain.

P2605

The usefulness of toluidine red unheated serum test (TRUST) in the diagnosis of HIV-negative neurosyphilis

J. Ying, C. Xiaohong, M. Xiaomeng, Y. Yu, P. Fuhua, H. Xueqiang
The Third Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Goal: To evaluate the usefulness of toluidine red unheated serum test (TRUST) in diagnosis of HIV-negative neurosyphilis.
Study design: We retrospectively analyzed 41 cases of clinically diagnosed neurosyphilis and 34 latent syphilitic patient underwent lumbar puncture in the third affiliated hospital of Sun Yat-sen University from Jan 2003 and Dec 2009. Neurosyphilis was defined as a cerebrospinal fluid (CSF) white blood cell count >5 cells/μL with a positivity for CSF T-pallidum particle agglutination (TPPA) or reactive CSF venereal disease research laboratory (VDRL) test. The HIV-test for neurosyphilis were all negative.
Results: The sensitivity of the TPPA, VDRL, TRUST in symptomatic neurosyphilis respectively was 100%, 93.1% and 94.7%. The specificity of the TPPA, VDRL, TRUST respectively was 58.8%, 100% and 100%. Neurosyphilis remained significantly more common in subjects with a serum TRUST titer≥1:16, with an odds ratio (OR) of 8.04 (95% CI, 1.52-42.43) and the stringent linear correlation (r=0.615, p=0.015) between Log base 2 serum TRUST titres and CSF TRUST titres.
Conclusion: Serum TRUST titres could be the indication of lumbar puncture in syphilitic patients and a reactive CSF-TRUST is considered diagnostic of neurosyphilis. The TRUST is a useful adjunctive test when VDRL is not available, especially in China.

P2606

Vestibular-evoked myogenic potential (VEMP) to evaluate cervical myelopathy in human T-cell lymphotropic virus type I infection

L. Felipe[1], M.A.R. Santos[2], J.R. Lambertucci[1], A.B. Carneiro-Proietti[3], F. Proietti[4], J.G.R. Ribas[5], D.U. Gonçalves[1]
[1]Tropical Medicine Post Graduate Program, [2]Federal University of Minas Gerais, [3]Fundação Centro de Hematologia e Hemoterapia de Minas Gerais, [4]Medicina Preventiva e Social, Federal University of Minas Gerais, [5]Rede Sarah de Hospitais do Aparelho Locomotor Unidade, Belo Horizonte, Brazil

Summary of background data: VEMP is generated by acoustic or galvanic stimuli, passing through the vestibulo-spinal motor tract, the spinal nerves and recorded from surface electrodes on the sternocleidomastoid muscle. This test may be of value to investigate sub-clinical cervical myelopathy. HAM/TSP is a progressive inflammatory myelopathy with predominant lesions at the thoracic spinal cord level, although cervical spine can be affected.
Objective: To define clinical usefulness of vestibular-evoked myogenic potential (VEMP) to detect cervical medullar involvement related to human T-cell limphotropic virus type 1 (HTLV-1) associated myelopathy/tropical spastic paraparesis (HAM/TSP).
Methods: 72 individuals were evaluated: 30 HTLV-1 seronegative and 42 HTLV-1seropositive (22 asymptomatic, 10 with complaints of walking difficulty without definite HAM/TSP, 10 with definite HAM/TSP). VEMP was recorded using monaural delivered short tone burst (linear rise-fall 1ms, plateau 2ms, 1 KHz) 118 dB NA, stimulation rate of 5Hz, analysis time of 60ms, 200 stimuli, band pass filtered between 10 and 1,500Hz.
Results: VEMP had normal values in the seronegative group (30 controls). In the seropositive, abnormal VEMP was seen in 11/22 (50%) of the HTLV-1asymptomatic carriers, 7/10 (70%) of those with complaints of walking difficulty and 8/10 (80%) of the HAM/TSP patients. In this last group, the pattern of response was different. No VEMP response was more frequent when comparing to the asymptomatic carriers (2-tailed P-value=0.001).
Conclusion: VEMP may possibly be useful to identify patients with subclinical cervical myelopathy and to distinguish variable degrees of functional injury. Minor injury would be related to latency prolongation and major injury to no VEMP response.

P2607

Brainstem responses can predict death and delirium in sedated patients in intensive care units

B. Rohaut[1], R. Porcher[2], S. Siami[3], J. Bailly-Salin[4], N.S. Hopkinson[5], C. Guidoux[6], E. Iacobone[7], R. Sonneville[8], A. Polito[4], J. Aboab[4], S. Gaudry[4], O. Morla[4], G. Amouyal[4], J. Azuar[4], A. Vieillard-Baron[6], D. Annane[4], T. Sharshar[4], Paris-Ouest Study Group on Neurological Effect of Sedation (POSGNES)
[1]Intensive Care Unit, Respiratory Departement, Groupe Hospitalier Pitié Salpetriere/ Assistance Publique Hopitaux de Paris/ Université Paris 6, [2]Biostatistics and Medical Computer Science Department, Saint-Louis Teaching Hospital / Assistance Publique Hopitaux de Paris/, Paris, [3]Intensive Care Unit, General Hospital, Etampes, [4]Intensive Care Unit, Hopital Raymond Poincaré/ Assistance publique Hopitaux de Paris/ Université de Versaille Saint Quentin en Yvelines, Garches, France, [5]Respiratory Muscle Laboratory, National Heart and Lung Institute, Imperial College/ Royal Brompton Hospital, London, UK, [6]Medical Intensive Care Unit, Ambroise Paré Teaching Hospital/ Assistance Publique Hopitaux de Paris/ University of Versailles Saint-Quentin en Yvelines, Boulogne, France, [7]General Intensive Care Unit, Fermo Hospital, Fermo, Italy, [8]Medical Intensive Care Unit, Bichat-Claude Bernard Teaching Hospital /Assistance Publique Hopitaux de Paris / University of Paris VII, Paris, France

Background: In critically ill patients, the assessment of neurological function can be difficult because of the use of sedative agents. Altered mental status commonly occurs following the withdrawal of sedation in this group, but it is not known whether aspects of neurological examination can predict this.
Objectives: To assess whether abnormal brainstem responses within the first 24 hours of sedation are associated with mortality and altered mental status post-sedation.
Design: Observational prospective study including an initial single centre and a subsequent multicentre study to elaborate and then validate the prognostic models.
Methods: In critically ill patients sedated with midazolam (±sufentanyl), an examination including the Glasgow Coma Scale, the Assessment to Intensive Care Environment score, cranial nerve examination, response to noxious stimuli and the cough reflex was performed.
Findings: 72 patients were included in the initial group and 72 in the validation study. Neurological responses were independent of sedative dose. 22 patients in the fitting set and 21 (29%) in the validation group died within 28 days of inclusion. Adjusted for SAPS-II score, absent cough reflex was independently associated with 28-day mortality in the fitting (adjusted OR: 7.80, 95%CI:[2.00-30.4], p=0.003) and validation group (adjusted OR:5.44, 95%CI:[1.35-22.0], p=0.017). Absent oculocephalic response, adjusted for SAPS-II score, was independently associated with altered mental status after the withdrawal of sedation in the fitting (adjusted OR: 4.54, 95% CI:[1.34-15.4], p=0.015) and validation groups (adjusted OR:6.10, 95% CI:[1.18-25.5], p=0.012).
Interpretation: Assessment of brainstem responses is feasible in sedated critically ill patients and predicts mortality and post sedation complications.

P2608

Effect of prism adaptation in cortical activity in neglect patients

A. Saj[1], R. Vocat[1], Y. Cojan[2], J. Luauté[3], P. Vuilleumier[2]
[1]Departement of Neurology, University Hospital of Geneva, [2]University of Geneva, Geneva, Switzerland, [3]Université de Lyon, Lyon, France

Introduction: Hemispatial neglect is often resistant to rehabilitation. Recent studies suggested that this disorder may be improved by prism-adaptation, with remarkable generalization and persistence of such effects, but the underlying neural mechanisms remain unclear. Functional neuroimaging in healthy volunteers indicates that prism-adaptation relies on a distributed network including posterior parietal, temporal, and cerebellar regions, which is partly damaged in neglect patients.
Methods: We used fMRI to investigate the effect of (right-deviating) prism-adaptation on 7 patients with left neglect while they perform various cognitive tasks on the same visual stimuli (bisection, search, and memory), before and after a brief prism-adaptation session.
Results: Behavioural data showed significant improvement ($p<0.03$) following prism-adaptation only for the line bisection and visual search tasks. fMRI analysis comparing brain activity after and before adaptation showed selective increases in activation ($p=0.001$) of the right posterior parietal cortex and left superior parietal cortex, as well as bilateral occipital cortex. For the search task, the right temporo-parietal junction was significantly more activated, together with bilateral posterior parietal cortex and bilateral occipital cortex. No significant changes in behavioural performance or cortical activity were found in any region.
Conclusion: Our results provide new evidence that the beneficial effects of prism adaptation on neglect are linked to a specific modulation of brain regions crucially involved in spatial attention.

P2609

Assistive technology to access stimulus events and social contact for persons with severe post-coma motor impairment and minimally conscious state

F. Colonna[1], G.E. Lancioni[2], J. Navarro Solano[1], F. Buonocunto[1], V. Sacco[1], G. Megna[3]
[1]Rehabilitation Hospital, S. Raffaele Foundation, Ceglie Messapica, [2]Department of Psycology, [3]Department of Neuroscience, University of Bari, Italy

We assessed programmes to promote constructive engagement, requests, and choice by 15 persons with pervasive motor disabilities and consciousness/communication disorders following acquired brain injury. The programmes were based on learning principles and use of assistive technology (e.g. sensors to monitor participant's responses and trigger environmental stimulation). A basic objective was the participant's acquisition of simple responses to access environmental stimulation independently. Other objectives included calling for caregiver attention and choosing between environmental stimuli. Microswitch technology was used for the basic objective; VOCA and computer technology served for the other objectives. The results were very encouraging. The technology developed for the different objectives promoted consisting levels of constructive engagement by the participant with improvements in the level of stimulation, communication and social contact. These findings maybe particularly relevant for daily rehabilitation programmes for persons with similar levels of disabilities.

P2610

Proton magnetic resonance spectroscopy in mild traumatic brain injury patients with normal-appearing structural brain MRI

Š. Sivák[1], A. Demková[1], M. Bittšanský[2], M. Turčanová-Koprušáková[1], V. Nosáľ[1], E. Kantorová[1], H. Poláček[3], D. Dobrota[2], E. Kurča[1]
[1]Clinic of Neurology, [2]Department of Medical Biochemistry, [3]Clinic of Radiodiagnostics, Jessenius Faculty of Medicine, Comenius University, Martin, Slovak Republic

Introduction: Mild traumatic brain injury (MTBI) is a very common neurotraumatological diagnosis. Structural brain magnetic resonance imaging (MRI) is typically normal in most patients after MTBI. The aim of our study was to assess the use of voxel proton magnetic resonance spectroscopy (1H-MRS) in patients with normal MRI.
Methods: This study investigated 8 MTBI patients and 8 sex-, age- and education-matched healthy controls. Both groups underwent structural brain MRI (T1,T2*,FLAIR, DWI/ADC) and single-voxel 1H-MRS examination of both frontal lobes and upper brainstem (the patient group within 96h after injury). Spectra were evaluated with LCModel software. In order to avoid partial volume effects of CSF, only ratios of total N-acetylaspartate (NAA) to total creatine (Cre) and choline (Cho) were used for calculations.
Results: Significant decrease of NAA/Cre ratio ($p=0.017$) was found in the frontal cortex. No significant metabolite changes were present in brainstem voxel.
Conclusions: In this preliminary results, 1H-MRS appears to be sensitive to detect subtle traumatic changes in normal appearing frontal lobes after mild traumatic brain imaging. These results warrant further study.

P2611

Mortality from traumatic brain injury after reduction of alcohol prices: a population-based study from Northern Finland

J. Puljula[1], S. Lesonen[1], M.-L. Kortelainen[2], M. Hillbom[1]
[1]Neurology, Oulu University Hospital, [2]Forensic Medicine, Oulu University, Oulu, Finland

Background and aims: Brain injury is the leading cause of death after trauma, and alcohol is a well-known risk factor for traumatic brain injury. In Finland alcohol taxes were cut by one third in 2004. This resulted in an increase (10%) of alcohol consumption particularly among women and people aged over 50 years. We investigated whether the observed changes in drinking habits influenced the number of fatal traumatic brain injuries (TBI).
Material and methods: We identified all fatal TBIs among the residents of Oulu province (n=469,304) during the years 1999 (n=104) and 2006 (n=110). Alcohol was measured from 76% of all cases and 96% of those where the trauma resulted in death in less than 24 hours. We also recorded cases with alcohol-related diseases in the death certificate
Results: The total number of alcohol-related cases (measured and/or recorded) did not increase from 1999 to 2006. Alcohol-related cases involved significantly older patients in 2006 than in 1999 (mean difference 7.6 years, 95% CI 0.09-15.0). The proportion of alcohol-related cases increased from 18 to 31% (1999–2006) among women and decreased from 63 to 52% among men. The fraction of alcohol-related cases increased particularly among women aged 15-54 and men aged 35-54, but decreased among men aged 15-34.
Conclusion: The reduction of alcohol prices and the concomitant increase in alcohol consumption did not cause an increase in the total number of fatal TBIs. However, alcohol-related fatal TBIs increased among women and middle-aged people but decreased among young men.

P2612

Early CT signs of progressive hemorrhagic injury following acute traumatic brain injury

W.-S. Tong, P. Zheng
Shanghai Pudong New Area People's Hospital, Shanghai, China

Objective: To analyze the early CT signs of progressive hemorrhagic injury following acute traumatic brain injury (TBI) and explore their clinical significances.
Methods: PHI was confirmed by comparing the first and repeated CT scans. Data were analyzed and compared including times from injury to the first CT and signs of the early CT scan. Logistic regression analysis was used to show the risk factors related to PHI.
Results: A cohort of 630 TBI patients was evaluated, and there were 189 (30%) patients suffering from PHI. For patients with the first CT scans were obtained as early as 2 hours post injury, there were 116 (77.25%) cases suffering from PHI. The differences between PHIs and non-PHIs were significant in the initial CT scans showing fracture, subarachnoid haemorrhage (SAH), brain contusion, epidural hematoma (EDH), subdural hematoma (SDH) and multiple hematoma as well as the times from injury to the first CT scan ($p<0.01$). Logistic regression analysis showed that early CT scans (EDH, SDH, SAH, fracture and brain contusion) were predictors of PHI ($p<0.01$).
Conclusions: For patients with the first CT scan obtained as early as 2 hours post injury, a followed CT scan should be performed promptly. If the initial CT scan shows SAH, brain contusion and primary hematoma with brain swelling, an earlier and dynamic CT scan should be performed for detection of PHI as early as possible and the medical intervention would be enforced in time.

P2613

Activation of TLR4/NF-κB inflammatory signalling pathway following traumatic spinal cord injury in rats

W. Jin, H. Ni, W. Liang
Neurosurgery, Drum Tower Hospital, Medical School of Nanjing University, Nanjing, China

Inflammatory response plays an important role in the pathogenesis of traumatic spinal cord injury (SCI). Toll-like receptor 4 (TLR4) has been demonstrated to play a crucial role in initiating inflammation and then regulating transcription factor nuclear factor-kappa B (NF-κB) inflammatory signalling pathway. This study was therefore undertaken to detect the activation of TLR4 and NF-κB related inflammatory signalling pathway in a model of spinal cord injury in rats. Adult Sprague-Dawley rats were divided into six groups: control group with sham operation and SCI groups at hours 6, 24, 48, 72, and 168 (n=12). SCI was created extradurally with an aneurysm clip at the T8-T9 level. Spinal gene and protein expression of TLR4, DNA-binding activity of NF-κB, inflammatory cytokines levels and spinal cord water content were measured. Compared with that of control group, mRNA and protein expression of TLR4 were significantly increased with the maximum at 24h and 72h respectively. The elevated NF-κB DNA-binding activity was detected and peaked at 72h postinjury. The concentrations of TNF-α, IL-1β and IL-6 were significantly increased and maximal at 24h, 24h and 72h, respectively. The spinal cord exhibited oedema postinjury and became more severe at 72h. There were highly positive correlations between the expression of TLR4 and upregulation of NF-κB inflammatory signalling pathway. The results suggest that SCI induces the activation of TLR4/NF-κB inflammatory signalling pathway in the injured rat spinal segment, which may play a central role in the injury-induced second insult of spinal cord.

P2614

Management of mild traumatic brain injury: current approach in neurological and general medical practice and need for further harmonization in advanced post-graduate medical education

Y. Alekseenko
Department of Neurology and Neurosurgery, Vitebsk State Medical University, Vitebsk, Belarus

Introduction: Some controversies and differences in approach to diagnosis and management in patients with mild traumatic brain injury (MTBI) in neurological as well as in general medical practice, including emergency departments and outpatient services, seem to be quite a common problem.
Objective: Our objective was to clarify the most significant variations in the assessment and management of MTBI patients in different clinical settings for the further improvement of the program of advanced training of medical specialists.
Methods: We analyzed 184 medical records of consecutive admissions and referrals concerning MTBI. Besides, we conducted structured interviews among 48 neurologists, surgeons and general practitioners.
Results: One of the most common problems seemed to be a superficial evaluation and inappropriate interpretation of post-traumatic consciousness and especially memory disorders. Standard protocols were in use only in 58% of cases. Some significant differences were revealed in the frequency and timing of the appointment of CT, MRI and skull radiography during the initial management of MTBI because of their limited availability. Most specialists (64%) usually overestimate the probability of early intracranial complications and remote consequences such as post-traumatic headache, posttraumatic seizures or cognitive disorders in patients with MTBI. This approach led to extensive use of medications and prolonged bed rest. There were also some differences in the follow-up and rehabilitation. The nature and mechanisms of persistence of subjective posttraumatic syndrome are variably understood.
Conclusion: The obtained data should be used as a basis for elaborating special advanced training programs for different categories of medical specialists.

P2615

Neurocysticercosis (NCC): a not so rare parasitic infection in Geneva, Switzerland

V. Castillo Cruz[1], P.R. Burkhard[2]
[1]Neurorehabilitation, [2]Neurology, Geneva University Hospitals, Geneva, Switzerland

Objective: NCC has caused a recent increase in the incidence of this parasitic disease in industrialized countries. Our aim was therefore to review the common manifestations of NCC in a small cohort of patients seen in Geneva, its diagnostic workup, treatment, course and prognosis.
Methods: We report 6 patients who were diagnosed and medically treated for NCC during the last 10 years. Seizures were the most frequent symptom at onset. Serological analyses in the cerebrospinal fluid (CSF) and repeated brain CT or MRI were most helpful not only for diagnosis but also for the follow-up assessment. All patients received corticoids and cysticidal drugs therapy, and symptomatic treatment in all.
Results: There were six patients with NCC, 2 males and 4 females aged between 25 and 35 years at disease onset. They were treated and followed during 10 years. 2 were Swiss citizens living in Geneva while the others were from endemic zones. In all patients, seizures were the inaugural manifestation. 4 patients had complex partial and generalized seizures. 1 patient had partial seizures with autoscopic phenomena. In 3 patients serological analysis (CSF) and the CT scan, MRI brain provided the diagnosis of NCC contributed to follow-up brain imaging showed multiple intraparenchymal viable cysts and calcifications former. All patients received corticoids during cysticidal drug therapy.
Conclusions: Neurological manifestations in patient sreturning from an endemic zone should promptly search for NCC with CSF, brain CT and MRI. Total disappearance or significant regression of clinical and radiological signs with treatment ultimately confirms the diagnosis.

P2616

The change of neuron-specific enolase and adenosine deaminase in tuberculous meningitis

W.-J. Kim
Neurology, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Republic of Korea

Introduction: Prompt treatment is important to tuberculous (Tbc) meningitis and a delay in diagnosis will be followed by irreversible neurologic damage. But the culture of Tbc from CSF takes a minimum of two weeks, it needs other diagnostic tests for early determination.
Objective: To confirm value the neuron-specific enolase (NSE) and adenosine deaminase (ADA) in diagnosis and differentiation of Tbc meningitis.
Patients and methods: 18 Tbc meningitis patients were included in this study. We compared with 20 normal control and 22 aseptic meningitis patients, age-matched.
Result: The NSE and ADA concentration of CSF in Tbc meningitis group was 14.89±2.63ng/ml and 12.09±2.02IU/L each. They were significantly higher than normal control and aseptic meningitis group. Also the ratio of CSF to serum NSE was 1.54±0.23 and significantly higher in Tbc meningitis group. But serum NSE was 9.87±1.83ng/ml and no statically difference to other groups.
Conclusion: The NSE and ADA in CSF and CSF to serum NSE ratio are helpful tests for diagnosis of Tbc meningitis.

P2617

Correlation of lactate dehydrogenase activity and 14-3-3 protein in cerebrospinal fluid from patients with Creutzfeldt-Jakob disease

M. Torres[1], J.M. Matamala[2], N. Hernandez[1], C. Hetz[3], L. Cartier[2]
[1]FONDAP Center for Molecular Studies of the Cell and Millennium Nucleus for Neural Morphogenesis, Facultad de Medicina, Universidad de Chile, [2]Departamento de Ciencias Neurologicas Oriente, Universidad de Chile, [3]NeuroUnion Biomedical Foundation, Santiago, Chile

Creutzfeldt-Jakob disease (CJD) is the most frequent human prion disease. The detection of 14-3-3 protein in cerebrospinal fluid (CSF) is used as molecular criteria to diagnose CJD. The mechanisms leading to a positive 14-3-3 signal in CSF are not fully understood, however, a rapid neuronal lysis is assumed to be the cause for the rise of 14-3-3. If the lysis is the cause, the lactate dehydrogenase levels (LDH) should increase in the CSF of CJD patients. The aim of this study was to correlate the levels of LDH activity with the expression of 14.3.3 protein in CSF samples from patients with CJD. We studied CSF samples from 32 CJD patients and 30 control cases. The samples were analyzed by western blot using an anti-14-3-3 antibody. The quantification of LDH activity was analyzed by a colorimetric quantitative assay. We compared LDH activity between patients with low and high levels of 14-3-3 protein. In some cases, a serial CSF samples from the same patient were assessed the LDH activity correlated with the levels of 14-3-3 protein. In addition, the kinetic of 14-3-3 expression in CSF were different in two CJD patients that were followed over time and had autopsy analysis that confirmed the CJD diagnosis. Our data suggest dissociation between disease progression with 14-3-3 immunoreactivity and LDH activity in CSF samples from CJD patients, suggesting that the presence of 14-3-3 in CSF may not be due to cellular lysis and may represent an active process against PrP misfolding.

P2618

Functional and neurocognitive comparisons of older and younger adults with and without HIV

D.E. Vance[1], P.L. Fazeli[2], P.R. McKie[1]
[1]School of Nursing, [2]Department of Psychology, University of Alabama at Birmingham, Birmingham, AL, USA

Objective: As highly active antiretroviral therapy is able to extend life, many aging with HIV may be at-risk for functional and neurocognitive deficits. In this study, we examined the cognitive and functional performance of younger (21 to 49 years) and older (50+ years) adults with and without HIV.
Method: Participants (n=172) were administered a neurocognitive battery and the Timed Instrumental Activities of Daily Living test. ANCOVA's were used to test the main effects of age and HIV status and the interaction, after controlling for gender and education.
Results: For psychomotor speed, there was a significant effect of age, with those who are younger performing better. For speed of processing, there was a significant main effect of both HIV status and age for 3 measures, with those who are older and HIV-positive performing worse. Another speed of processing measure only yielded HIV status as a main effect, and age emerged as a trend (p=0.06). For the memory and executive functioning domains, no statistically significant differences across groups were detected. In the Timed Instrumental Activities of Daily Living test, there was an HIV x age interaction, as well as a main effect of HIV status, with those who are older with HIV performing worse on such everyday functional tasks (e.g. looking up a phone number).
Conclusions: The results of this study indicate that those with HIV may be at risk of poorer cognitive performance compared to their HIV-negative counterparts; this deficit may transfer to performing everyday tasks.

P2619

Two cases of mycotic carotid pseudoaneurysm with thrombosis

H.C. Jang, D.H. Kim, C.I. Park, S.H. Kim
Department of Neurology, Yonsei University Wonju College of Medicine, Wonju, Republic of Korea

Introduction: Mycotic carotid pseudoanuerysm with thrombosis is a rare and catastrophic disease. Serial carotid duplex ultrasonography are easy and useful for disease follow-up and treatment decision.

Case report 1: A 72-year-old man was admitted with neck pain for 5 days. He was a chronic alcoholic. During the physical examination, a tender pulsatile mass was palpated in the left neck. His electrocardiogram showed atrial fibrillation. Neck CT angiography and carotid ultrasonography revealed mycotic pseudoaneurysm of the left carotid artery with a 1.4cm thick thrombus. Echocardiography and blood culture were negative. His symptoms improved after antibiotics and anticoagulation therapy. In the carotid ultrasonography taken 20 days after the symptoms onset, dilated carotid lumen decreased and the thrombus completely disappeared.

Case report 2: A 58-year-old woman was admitted with left neck pain and palpable pulsatile mass. Four years ago, she carried out total thyroidectomy for thyroid cancer. On neurologic exam, abnormal findings aren't noted. In laboratory test, ESR was elevated (67mm/hr). Neck CT angiography and carotid ultrasonography revealed mycotic pseudoaneurysm of the left carotid artery bifurcation area with 1.4cm thickness thrombus. Echocardiography and culture study were negative. Her symptoms improved after antibiotics and anticoagulation therapy. In the carotid ultrasonography taken 14 days after the symptoms onset, thrombus thickness reduced to 2.3mm. After discharge, anticoagulation therapy continued. Neck pain and palpable mass disappeared.

Conclusion: We report two patients with mycotic carotid pseudoaneurysm with thrombosis.

P2620

A case of AIDS presenting with hemiballism

S. Bek, T. Kasikci, H. Akgun, Y. Kutukcu, Z. Odabasi
Gulhane Medical Academy, Ankara, Turkey

Introduction: Neurological symptoms are common in patients with acquired immunodeficiency syndrome (AIDS). Small portions of these symptoms consist of movement disorders.

Case report: A 30-year-old man was admitted to the hospital complaining of involuntary movements of right arm, leg and the right side of his face. He described high fever 15 days ago before his symptoms had begun. The involuntary movements were forceful jerky, irregular flinging and large amplitude movements involving his right arm and leg proximal as well as distal. Dyskinesias were on right side of his face. Brain T2-weighted imaging showed high-intensity signal abnormalities at the level of the left subthalamic nucleus and right lentiform nucleus. After detection of anti HIV antibodies the result was confirmed with western-blot test. CD4/CD8 ratio determined as 0.02 and then the patient was diagnosed as AIDS. He was prescribed Tetrabenazine 50mg/day, the dosage was gradually increased to 125mg per day.

Conclusion: The types of movement disorders in AIDS include hemiballism, hemichorea, myoclonus, tics, paroxysmal dyskinesias, tremor, and parkinsonism, which may be associated with primary or secondary (opportunistic) infection. The causative lesion is usually in the subthalamic nucleus (STN), contralateral to the side of the movements, but may be found in the afferent or efferent pathways leading from the STN to its projection areas, which include the thalamus, globus pallidus, putamen, substantia nigra and motor cortex. HIV infection should be investigated especially for the patients in risk groups.

P2621

Rhombencephalitis with spinal cord involvement due to Listeria monocytogenes

M.C. Pires[1], P. Carneiro[2], M. Couto[1], A. Prisca[3], R. Mota[1], J. Lopes[1], J. Vasconcelos[1]
[1]Neurology, [2]Radiology, [3]Infectious Diseases, Hospital do Divino Espírito Santo, Ponta Delgada, Portugal

Introduction: Listeria monocytogenes is an important cause of CNS infection in neonates, immunosuppressed patients, elderly adults and pregnant women but rarely in healthy individuals. Well-recognized clinical syndromes include meningitis, meningoencephalitis, cerebritis, brain abscess, rhombencephalitis and myelitis. We present a case of rhombencephalitis due to Listeria monocytogenes in a previously healthy individual.
Case report: A 29-year-old male presented with a seven-day history of headache and left hemiparesis. Brain MRI displayed hypo-intense, contrast-enhancing lesions on T1-weighted scans and hyper-intense on DP T2/FLAIR weighted scans in the brainstem and left cerebellar hemisphere. CSF findings included 120 lymphocytes/mm^3, a protein level of 0.78g/l, normal glucose level, and negative cultures. ADEM was considered and he was treated with IV corticosteroids, with almost complete recovery. Forty-eight hours later he developed fever and flaccid paraplegia with a T6 sensory level. Cervical and thoracic spine MRI revealed smaller brainstem lesions associated with a diffuse intramedullary lesion extending from C6 to T6. CSF showed uncountable neutrophils, a glucose level of 5mg/dl and a protein level of 4.9g/l. CSF culture was positive for Listeria monocytogenes. The patient was treated with IV ampicilin and gentamicin, with no functional recovery. MR images obtained before discharge revealed more widespread intramedullary lesions, extending from lower cervical to lumbar levels.
Discussion: Rhombencephalitis is a rare manifestation, with high mortality and morbidity. This diagnosis should be considered in patients with a subacute onset of focal symptoms associated with CSF pleiocytosis and brainstem/cerebellum lesions. In this case corticosteroids may have contributed for spinal cord lesion extension.

P2622

Vacuolar myelopathy and peripheral neuropathy in HIV-infected women

O. Zaharia-Pushkash[1], V. Lisnic[2], E. Manole[2], A. Feodorovici[1]
[1]Neurorehabilitation, [2]Neurology, Institut of Neurology and Neurosurgery, Chisinau, Moldova

Background: Peripheral neuropathy (PN) has emerged as the most common neurological complication of HIV-infection. Vacuolar myelopathy (VM) is the most common chronic myelopathy in HIV-infected patients. It occurs usually during the late stages of HIV-infection and most patients die within 6-9 months after symptoms onset.
Objectives: To examine the neurological manifestations in HIV infected childbearing women.
Methods: 8 HIV-positive women were examined before pregnancy and at 3, 6, 12, 24, 36 months after childbirth. Neurological examination, EMG, CD4+ lymphocyte counts and HIV RNA viral load were performed.
Results: Low CD4+ lymphocyte count and high viral load in the III trimester of pregnancy determine the rapidly progressive disease with clinical and electrophysiological evidence of PN. These facts lead to start the active antiretroviral therapy (HAART) immediately after birth. In 6 women PN evaluated gradually with relative long remission after HAART administration. In 2 cases we observed a fulminate (less than 2 months) and aggressive (severe spastic tetraparesis) development of vacuolar myelopathy, confirmed by means of MRI.
Conclusions: Pregnancy could be an aggravating factor for NP and predictor for malignant evolution of HIV infection in young women. VM is considered to be a chronic manifestation. With HAART the life expectancy may extend to 4 or more years.

P2623

A technology-based learning assessment procedure as a diagnostic supplement for persons in vegetative state

G. Lancioni[1], J. Navarro Solano[2], F. Colonna[2], F. Buonocunto[2], V. Sacco[2], C. Lanzilotti[2], G. Megna[3]
[1]*Dipartimento di Psicologia, Università degli Studi di Bari, Bari,* [2]*Presidio di Riabilitazione ASL Brindisi, Fondazione San Raffaele, Ceglie Messapica,* [3]*Dipartimento di Neuroscienze, Università degli Studi di Bari, Italy*

Post-coma persons in an apparent condition of vegetative state and pervasive motor impairment pose serious problems in terms of assessment and intervention options. A technology-based learning assessment procedure might serve for them as a diagnostic supplement with possible implications for rehabilitation intervention. A learning setup was arranged for 14 persons with a reported diagnosis of vegetative state, and completed with 11 of them. Signs of learning by the patients would underline an improvement in their immediate situation with potential implications for their general prospect, and could help revise their diagnosis: from vegetative state to minimal consciousness state. The response adopted in the learning setup were minimal movements already available in their behaviour repertoire. The micro switch technology used for detecting such responses included among others optic and pressure sensors and an electronic control system that activated stimuli in relation to the participant's responses. The study followed an ABABCB sequence, in which A represented baseline periods, B intervention periods with stimuli contingent on the responses, and C a control condition with stimuli presented non-contingently. Data for 9 of the 11 participants who completed the study sequence showed that the level of responding during the B phases was significantly higher than the levels observed during the A phases as well as the C phase. These data indicate clear signs of learning with possible suggestion of minimal consciousness. Intervention strategies based on a learning format and suitable technology might be useful to supplement formal assessment procedures and help modify previous diagnosis of vegetative state.

P2624

Effectiveness of transcranial Doppler in identifying cerebral hypoperfusion in comatose patients prior to diagnostic imaging procedures

I. Previgliano[1], F. Tamagnone[1], E. Martinez[2], S. Blejman[3], J. Rubianes[4]
[1]*Critical Care, Hospital Fernandez,* [2]*Critical Care, Sanatorio Colegiales,* [3]*Critical Care, Universidad Abierta Latinoamericana School of Medicine,* [4]*Critical Care, Instituto Argentino de Diagnostico y Tratamiento, Buenos Aires, Argentina*

Objective: To assess the effectiveness of transcranial Doppler (TCD) in identifying cerebral hypoperfusion and the response of diastolic velocities (DV) to the increase of mean arterial pressure (MAP) with expansion and inotropic drugs.
Study design: Intervention study. Interventions: TCD; if DV lower than 20cm/sec and Pulsatility Index (PI)>1.4, MAP was increased >110mmHg with expansion+noradrenaline.
Inclusion: Coma state prior to performing diagnosis imaging studies, with no depressant drugs.
Exclusion: Indication for urgent surgery.
Data: Age, gender, diagnosis, GCS score at admission, death or discharge from ICU, pre/post-treatment MAPs, DVs and PIs, expansion, inotropic drugs, pre/post- ICP calculation by means of Bellner's formula. Patients were considered to be responding when DV>20cm/sec.
Statistical analysis: Student's test, calculation of positive predictive value (PPV), negative predictive value (NPV), sensitivity (S), specificity (Si), and positive ratio likelihood (LR+).
Results: From 01/01/07 through 31/12/08; 28 patients, 9 with normal TCD were excluded. Analysis 19: ICH:6 patients; HI:5; meningitis:3; IS:1; SAH:1; tumor:1; acute hydrocephalus:1; hepatic encephalopathy:1. All differences between pre/post-treatment values were significant ($p<0.0001$). There were no differences in DVs of responding patients. Reverberating flow, systolic peak or DV<20cm/sec associated to brain death in 100%, S 0.43, Si 0.92, PPV 0.92, NPV 0.43, LR+ 6.06. Normal TCD was associated to 0% mortality, S 0.96, Si 0.59, PPV 0.67; NPV 0.95, LR+ 2.37.
Conclusions: TCD allowed identifying cerebral hypoperfusion. Increase of MAP in presence of "normal" values permitted improving hypoperfusion in 68%, with 47% survival rate.

P2625

Peripartum neurological emergencies in a critical care unit

R.M.A. Al-Hayali, D.J.S. Al-Habbo, M.K. Haj-Hammo
Department of Internal Medicine, Mosul College of Medicine, University of Mosul, Iraq

Objectives: Neurological emergencies are important causes of admission to the critical care units during pregnancy and puerperium. We studied the various causes of such presentation.

Patients and methods: A case series study that included women with acute deterioration of consciousness, with or without convulsions or neurological deficits, during pregnancy or puerperium, who were received in the critical care unit of Ibn Sina Teaching Hospital in Mosul, Iraq, from September 1, 2005 to August 31, 2006. A total of 30 women were included. They received careful clinical, radiological, and laboratory evaluation in an attempt to identify the cause of their presentation.

Results: Eclampsia was found to be responsible for two thirds of the cases (20 patients). The remaining one third were diagnosed as cerebral venous thrombosis (CVT) (7 patients), peripartum cerebral infarction (1 patient), intracerebral haemorrhage (1 patient), and acute fatty liver of pregnancy (1 patient). 4 of the women with CVT were having preeclampsia during pregnancy. Imaging studies, particularly MRI and MR venography, has provided the final diagnosis in most cases. Eclampsia was found more common in women presenting during their first pregnancy, while CVT was more common in multiparous women ($p=0.0001$). Cortical blindness was significantly associated with eclampsia rather than CVT ($p=0.01$).

Conclusion: Acute neurological symptoms in the peripartum period represent a diverse group of conditions, requiring careful clinical evaluation and an early access to imaging studies.

P2626

Non-invasive ventilation in paediatric neuromuscular diseases with acute respiratory distress: experiences from a tertiary centre

T.-H. Chen, J.-H. Hsu, S.-N. Yang, Y.-J. Jong
Kaohsiung Medical University Hospital, Kaohsiung, Taiwan R.O.C.

Objective: Pulmonary complication is the leading cause of mortality in children with neuromuscular diseases (NMD). Intubation for ventilator assistance usually lowers the survival rate due to difficulty in weaning, barotrauma, susceptibility to nosocomial infections and inevitable tracheostomy. We investigated the efficacy of non-invasive positive pressure ventilation (NIPPV) in NMD children with acute respiratory distress (ARD).

Methods: From 2005 to 2008, 10 NMD patients admitted to our paediatric intensive care unit and managed by NIPPV due to 11 events were retrospectively investigated. Assessment parameters were atrial blood gas (before, post NIPPV <12 hours vs. 24 hours) of pH, PaCO2, PaO2/FiO2 and transcutaneous SpO2. Favourable outcome was defined as free from intubation or successful extubation from ventilator-dependent status during the hospital stay. Unfavourable outcome was defined as inevitable endotracheal intubation.

Results: NIPPV was deployed by BIPAP (Respironics®) in 10 events and nasal CPAP (Sechrist®) in one. All patients survived in this cohort, with favourable outcome in seven events and unfavourable outcome in four. In the favourable group, acidosis and hypercarbnia improved after NIPPV use (pH: 7.38±0.06 vs. 7.29±0.06; PaCO2: 68.8±17.1 vs. 57.7±11.0mmHg; both $p<0.05$). Otherwise, persistent acidemia and lower PaO2/FiO2 were associated with unfavourable outcome (pH: 7.2±0.11 vs. 7.38±0.06; PaO2/FiO2: 173.7±74.2 vs. 304.6±94.4; both $p<0.05$).

Conclusions: With the support of NIPPV, 63% (7/11) events had favourable outcome. Our preliminary experiences highlight that NIPPV is a safe and effective alternative approach to NMD children with ARD.

P2627

Dysphagia in adults with neurological disorders

J.J. Martin[1], S. Gallara[1], E. Vespasiani[2], M. Caceres[2]
[1]Stroke Unit, [2]Neuropsychology and Neurorehabilitation Unit, Sanatorio Allende, Cordoba, Argentina

Introduction: Swallowing disorders, or dysphagia, result from a variety of neurological alterations, and its complications are severe. It is considered that localization of such lesions is a significant factor in development and prognosis of dysphagia. Our objectives are to determine the relationship between localization of the lesions in the central nervous system and the presence of dysphagia; and analyze the concordance between clinical deglutional evaluations a videofluoroscopic tests.
Patients and methods: Retrospective descriptive study, consecutive series of adult patients hospitalized in the Sanatorio Allende from Cordoba City. Dysphagia was identified using "Bedside Swallow Assessment" protocol. Patients were pooled according to diagnosis, and lesions subdivided in: right supratentorial, left supratentorial, bilateral supratentorial, infratentorial, and infra and supratentorial simultaneously. Clinical dysphagia incidence was calculated for each diagnosis and lesion localization, comparing them to those from patients with diffuse/non focal lesions.
Results: 201 patients; 130 (64.7%) males and 71 females, average age 61.1(±19.7) years. We found less dysphagia prevalence in multiple trauma patients, and in unilateral supratentorial lesions. We found no significant difference in the prevalence of dysphagia between clinical evaluation and videofluoroscopic results.
Conclusion: There is a good correlation between videofluoroscopy as an objective study, and clinical evaluation of deglution, which we consider establishes clinical evaluation a very useful tool in management of patients with neurological injuries, not only because of its specificity and sensibility, but also cause its simplicity and low cost.

P2628

Role of repetitive magnetic transcranial stimulation (rTMS) in aphasia rehabilitation

A.M. Bumbea[1], R. Traistaru[2], R. Popescu[2], A. Dinu[2]
[1]Medical Rehabilitation, [2]University of Medicine and Pharmacy, Craiova, Romania

Objectives: We purpose to evaluate the recovery of speech disorders in patients with recent ischemic stroke after rTMS for 10 days.
Material and method: We studied 14 patients with ischemic stroke 6 weeks ago, stable hemodynamically and neurologically, with mixed aphasia, prevailing motor, we point out that 2 patients were left handed before stroke. The patients were divided into two groups: one group of study LS-9 patients and a control group LM 5 patients. Both groups received appropriate medical treatment and individual kinetic program. The study group received rTMS on the side of the affected hemisphere. We applied rTMS for 5 minutes of 2 Tl, 100 W, with a frequency of 4Hz, using the coil figure of 8 to the affected hemisphere. The patients were checked at the initiation of treatment, at the end and every 2 months for one year. Monitoring consisted in using Sklar Aphasia Scale (SAS), FIM (Functional Independence Measure).
Results: The LS patients had an improvement of SAS using the 4 evaluation variables starting from 12 to 7, while the LM score 12 was maintained during the study period. The FIM increased significantly in patients of LS, the scores obtained were up 30% compared with the first assessment at 3 every months.
Conclusions: We can point out that rTMS is a method that can lead to improvement of degree of aphasia and shorten the therapy time facilitating the speech technique applied to these patients.

P2629

Effects of low intensity electrical stimulation on voluntary activation level and cortical excitability in patients with chronic anterior cruciate ligament deficiency

Y.-J. Chang[1], Y.-M. Huang[1], Y.-T. Hsu[1], W.-T. Tang[2], S.-W. Chou[1,3]
[1]Department of Physical Therapy, Chang Gung University, [2]Graduate Institute of Coaching Science, National Taiwan Sport University, [3]Department of Physical Medicine and Rehabilitation, Chang Gung Memorial Hospital, Taoyuan, Taiwan R.O.C.

Objective: Following anterior cruciate ligament (ACL) deficiency, the voluntary activation level was found to be decreased, and the resulting deafferentation post-injury could be potential mechanisms for weakness of the quadriceps. The purposes of the study is to investigate the effects of increasing sensory input by electrical stimulation (ES) on voluntary activation and cortical excitability in individuals with ACL deficiency.
Methods: 20 individuals with ACL deficiency and 20 healthy control subjects were recruited. The quadriceps voluntary activation level measured by interpolated twitch technique and the intracortical inhibition, intracortical facilitation elicited by transcranial magnetic stimulation were tested before and after 30 minutes of low intensity ES on quadriceps.
Results: Before ES, the quadriceps voluntary activation level and the intracortical inhibition of the ACL group was lower, and the intracortical facilitation was higher when compared to the control group. After 30 minutes of ES, the voluntary activation level of the ACL group increased, and the intracortical inhibition and intracortical facilitation were comparable to that of the controls.
Conclusion: Increasing sensory input by means of low intensity ES can "normalizing" intracortical inhibition and facilitation, thereby improving the voluntary activation level failure in ACL deficient individuals.
Keyword: ACL deficiency, voluntary activation, motor evoked potentials, intracortical inhibition, intracortical facilitation, Electrical Stimulation

P2630

Motor nerve conduction as an electrophysiological marker of rehabilitation progress for post-stroke hemiparetic patients

M. Adamczyk-Sowa, K. Pierzchala, J. Biernawska, P. Sowa
Medical University of Silesia, Zabrze, Poland

Aim of the study: The present work was to determine a relationship between changes in motor median nerve conduction parameters and upper extremity Wolf Motor Function Test (WMFT) in after-stroke hemiparetic patients.
Methods: 35 patients with hemiparesis after ischaemic stroke (mean age 67±12 years) were included in our study. Individuals suffering with carpal tunnel syndrome were excluded. Parameters of motor median nerve conduction and WMFT were analyzed in patients comparing affected and unaffected extremity during first 3 days of post-stroke catamnesis and after 6 months of standardized post-stroke rehabilitation program.
Results: Parameters of motor median nerve conduction: amplitude and motor nerve conduction velocity on the affected side increased after rehabilitation for about 6.04±1.4 mV vs. 3.92±1.06 mV ($p<0.05$) and 53.21±4.31 m/s vs. 39.61±3.55m/s ($p<0.05$), respectively, compared to starting values. Distal latency revealed no significant changes (3.94±0.51ms vs. 4.3±0.81ms, $p>0.05$). Electrophysiological parameters variations corresponded with 51.2% increase in WMFT scores after rehabilitation.
Conclusions: Clinical improvement in post-stroke patients after rehabilitation measured in increased WMFT score correlated with improvement of amplitude and conduction velocity of motor median nerve. Those results suggest that electrophysiological parameters can be used as objective markers for estimation of rehabilitation progress.

P2631

Dynamic TENS in management of low back pain: cluster analysis for efficiency prediction

L. Akhmadeeva[1], B. Veytsman[2], G. Rayanova[1], N. Setchenkova[1]
[1]*Neurology, Bashkir State Medical University, Ufa, Russia,* [2]*George Mason University, Fairfax, VA, USA*

Dynamic transcutaneous electrical nerve stimulation (DTENS) is one of the modalities for adjunct management of low back pain (LBP). Previously we presented the evidence of its superiority comparing to placebo in a pilot randomized controlled trial (L.Akhmadeeva et al., 2009). Recently (2010) we developed a method to predict whether a patient would benefit from DTENS treatment. We analyzed 74 clinical and paraclinical factors, including health-related quality of life and the results of psychological testing for 21 patients. We separated the patients into two clusters: the patients in cluster 1 do not benefit much from the treatment, while the patients in cluster 2 show significant (>40%) pain reduction. The clinical and paraclinical factors were used to "teach" the clustering (modified K-means) algorithm. To verify the learning, we gave it the data from 35 in-patients (37% men, mean age 47.2±1.6 years, SD=9.4) who got 10 DTENS-procedures for their LBP management. All patients showed significant pain reduction (mean=77.4%). This means that they all should belong to cluster 2. Our algorithm predicted significant pain reduction for 70% of patients and possible pain reduction for the remaining 30% of patients. Conclusion: the results allow us to prove that our model for prediction works. More training (especially with patients from cluster 1) can improve the sensitivity and selectivity of the method. Supported by RosObrazovanie (contract #1256).

P2632

Family needs in case of a severe brain injured relative with an altered state of consciousness: a Belgian study

C. Schnakers, O. Gosseries, D. Ledoux, S. Majerus, M. Boly, M.-A. Bruno, A. Demertzi, A. Vanhaudenhuyse, P. Boveroux, G. Moonen, S. Laureys
Coma Science Group, Cyclotron Research Centre, University of Liege, Belgium

Objectives: The objective of our study was to evaluate needs such as medical information, involvement in care as well as emotional, social, instrumental and professional supports in relatives of severely brain-injured patients recovering from coma.
Method: The Family Needs Questionnaire (French or Flemish version) was sent to the legal surrogate of patients being at home or hospitalized in one of the 37 centres (i.e., neuro-rehabilitation centres and nursing homes) involved in the Belgian federal network for the care of vegetative and minimally conscious patients.
Results: We collected 98 questionnaires. The majority of the participants considered the medical information, the involvement in care, the social and emotional supports as important to very important. Few participants were entirely satisfied for the following needs: medical information (29%), social (23%) and emotional (9%) supports. Moreover, 22% of the participants presented severe anxiety whereas 16% often felt depressed.
Conclusions: The evaluation and the satisfaction of the needs of patients' relatives are particularly important in order to maintain a good relationship with the medical staff and, hence, to optimize the care of patients recovering from coma.

P2633

The protective role of endurance exercise training against oxidative damage in the brain of rats with induced diabetes

M.D. Al-Jarrah[1], M. Jamous[2], Y. Al-Hammadi[3]
[1]Physiotherapy Department, [2]Neurosurgery, [3]Toxicology and Forensic Sciences, Jordan University of Science and Technology, Irbid, Jordan

Introduction: Diabetes is not viewed as a single disease but it is rather a group of metabolic disorders including alterations in the carbohydrate, fat, and protein metabolism associated with absolute and/or relative deficiencies in insulin secretion. It has been reported that the patho-physiology of diabetes includes increased oxidative stress and impaired expression of endogenous antioxidants in different tissues and organs in the body.
Goals and objectives: The main goal of this study is to evaluate the expression of heat shock protein (HSP), and inducible nitric oxide (iNO) in the brain of rats with induced diabetes, and to study the effect of endurance exercise training on the expression of these markers.
Materials and methods: 40 male Sprague-Dawley rats were randomized into 4 groups, sedentary control (SC, n=10), exercise control (EC, n=10), sedentary diabetic (SD, n=10), and exercise diabetic (ED, n=10). Diabetes was induced by alloxan injection (120mg/kg). Treadmill exercise training was carried out for 4 weeks starting as soon as the animals developed diabetes. Animals were sacrificed, and brain tissues were evaluated by immunohistochemistry for the expression of HSP and iNO.
Results and discussion: Diabetes leads to decrease level of HSP, There was also significant increased level of iNO in diabetic rats. Exercised reversed the trend and significantly increased the level of HSP and decreased the level of iNO.
Conclusion: Exercise in part protects the brain from oxidative stress damage that accompanied diabetes.

P2634

Role of electric stimulation in gait rehabilitation after stroke

E.I. Paun[1], L.D. Rusu[1], P.A. Rusu[2]
[1]Sports Medicine and Rehabilitation, [2]Mechanic Department, University of Craiova, Craiova, Romania

Objective: This study presents the role of electric stimulation (ES) on tibial anterior muscle and monitoring it regards gait rehabilitation.
Material and methods: 30 stroke patients (mean age 60y) in first 3 months post-stroke presented reduce of ankle dorsiflexion. We made lot A (n=15) received the rehabilitation program (included physical therapy) and also ES 10minutes/day and lotB (n-15) control group without ES. Both group were included in rehabilitation program 6 days/week during 45days. We monitored the results using clinical and functional assessment (specific scale for balance FIM, gait Tinetti, GIF) and also tensiomyography (TMG) for assessing the muscle change included muscle composition. For this we assessed time contraction (Tc-s) and displacement (Dm-mm) after we applied an electric stimulus induced isometric contraction.
Results: We observed that after treatment at lot A there was a significant improvement regarding clinical and functional assessment ($p<0.05$) and we observed an improvement of ankle dorsiflexion at lot A to 70% from patients and only 40% at lot B. Also we observed at TMG parameters that increase the Tc and Dm at lot A to the percent 70%, that means an increase of percent of fast muscle fibres induce by ES. These parameters had less improvement to lot B because only 20% of patients form lot B had an increase of Tc and Dm that means classic rehabilitation program cannot create muscle composition changes.
Conclusions: Rehabilitation program must be complex and associate with a complex monitoring using in the same time the clinical and functional assessment and also neuromuscular assessment like TMG.

P2635

Clinical efficacy of early verticalization procedure in neurocritical care patients

E. Leskovec, A. Belkin, A. Alasheev, I. Leiderman
Clinical Institute of the Brain, Yekaterinburg, Russia

Objectives: Procedure of verticalisation is one of the main methods of early rehabilitation. Prolonged horizontal position in ICU patient leads to alterations in gravitation gradient (GG). GG reflects the possibility of man to change the position of the body. Orthostatic failure is closely connected with decreased cerebral perfusion pressure (CPP). The value of GG in neurocritical care patient may be considered as a criterion of cerebral circulation auto-regulation.
Aim of study: The determination of cerebral and systemic vascular auto regulation during procedure of early verticalization in the neurocritical care patients.
Materials and methods: Prospective, cohort monocenter study was provided in 32 patients of neuroICU. Patients were divided into two groups in accordance with the period of horizontal position in intensive care unit: group1 – 3 days and group2 – more than 3 weeks. Healthy volunteers were included into control group. Mean arterial pressure (MAP), circulation velocity (Vm) and cerebral transient hyperaemia test (THT) were measures in all groups.
Results: Number of patients: 13 (G1), 19 (G2), 12 - Cont.Age, years: 47 (14)-G1; 46 (11)-G2; 50 (4)-Cont. MAP, ìì Hg: 3 (-4; 10) -G1; -1 (-7; 5)* -G2; 15 (7; 22)-Cont. Vm, m/s: -7 (-12; -2)*-G1; -6 (-11; -1)*-G2; 2 (-1; 4)-Cont. THT: -0.06 (-0.11; -0.01)-G1; -0.06 (-0.10; -0.02)-G2; -0.01 (-0.03; 0.01)-Cont
Conclusion: There were no significant differences in systemic hemodynamic response and auto regulation capacity in the compared groups. Verticalization is safe and may be recommended for early rehabilitation in neurocritical care patients.

P2636

Five year survival after stroke and related prognostic factors

R. Radziuviene[1,2], H. Kazlauskas[2,3], N. Raskauskiene[1], G. Varoneckas[1,2,3]
[1]Institute of Psychophysiology and Rehabilitation of Kaunas Medical University, Palanga, [2]Klaipeda University, [3]Klaipeda University Hospital, Klaipeda, Lithuania

Objective: We studied prognosis of survival after a stroke in 1,045 patients who survived at least 28 days after onset while taking into account six selected comorbidities: hypertension, diabetes, congestive heart failure, history of myocardial infarction, angina pectoris, and atrial fibrillation.
Methods: We performed a prospective hospital-based study of 522 men (mean age 63.8 SD 10.0 yrs) and 523 women (68.0 SD 10.6 yrs) who were discharged from the index hospitalization and were followed regularly at about 6-month intervals until death or the end of the study (average follow-up 4.8 SD 0.5 years). The Cox proportional hazards model was used to identify the baseline risk factors associated with the mortality. To minimize the effect of the initial stroke itself on mortality we studied only those who had survived at least 28 days after the initial stroke.
Results: By the end of the study, 169 had died; the cumulative survival rate was 83.9%. Adjacent diseases (congestive heart failure, history of myocardial infarction, angina pectoris, atrial fibrillation, and diabetes) increased the relative death risk from 33% to 57%. The prognostic factors with major influence on long-term survival were older age, male sex, and history of myocardial infarction (RR=1.93, 95%CI 1.29-2.87), diabetes (RR=1.63, 1.06-2.51), atrial fibrillation (RR=1.64, 1.16-2.33), and prior mobility (RR=1.56, 1.12-2.16). Hypertension was not significantly associated with increased mortality.
Conclusions: This study clarifies prognosis for survival after an initial stroke by taking into account other confounding variables that could also contribute to risk of death.

P2637

Care management of spasticity in patients with progressive multiple sclerosis and stroke survivors: a one-year follow-up prospective study

A. Clemenzi[1,2], E. Troisi[1], L. Pace[1], A. Tonini[1], A. Pompa[1], A. Cuccaro[1], P. Casillo[1], M.G. Grasso[1]
[1]U.O. 'E', I.R.C.C.S. Fondazione "Santa Lucia", [2]Neurology, "Sant'Andrea" II Faculty of Medicine, Sapienza University, Rome, Italy

The aim of the study was to evaluate both the efficacy and safety of "de novo" Botulinum toxin type A (BT-A) treatment over a one-year follow-up period in a continuous series of 13 progressive MS (P-MS) patients and 23 stroke survivors (S-S), and to identify the clinical characteristics independently associated with a better clinical outcome.
BT-A injections were performed every 3 months, or longer, according to the patients' clinical condition. Both functional (Barthel) and spasticity (Asworth) scales were recorded at the baseline and at the end of the follow-up period.
All the patients showed a significant reduction in the Ashworth scale ($p<0.05$), and no adverse events attributable to BT-A were recorded. By contrast, the mean Barthel score did not improve significantly if compared with the baseline score.
When evaluating both functional and spasticity mean changes at the end of the follow-up, BT-A treatment was found to be more effective in S-S patients treated early after the onset of spasticity ($p=0.04$), regardless of the number of injections.
In conclusion, BT-A treatment proved to be effective and safe for the treatment of spasticity in both P-MS and S-S patients. The lack of a correlation between clinical outcome and the number of injections at the one-year follow-up suggests, besides direct inhibition at the neuromuscular junction, a more distant long-term effect of BT-A.
Further studies are needed to determine whether BT-A may be effective as a preventive strategy against the onset of spasticity in early MS stages.

P2638

Two single-case studies of interactive bimanual virtual mirror therapy on chronic stroke patients

K. Eng[1], C. Schuster[2], A. Heinrichs[2], B. Keisker[3], L. Holper[1], E. Chevrier[1], P. Pyk[1], D. Kiper[1]
[1]Institute of Neuroinformatics, University of Zurich and ETH Zurich, Zurich, [2]Reha Rheinfelden, Rheinfelden, [3]Institute of Neuroradiology, University Hospital Zurich, Zurich, Switzerland

Aim: Effective evaluation of a novel interactive motor rehabilitation system (iCTuS), based on a virtual reality version of mirror therapy, on upper limb motor function in chronic stroke patients.
Design: Single case research design (2 patients).
Material and methods: Patients received 45-minute therapy sessions 5x/week over 4 weeks. They sat in front of a monitor (81cm diagonal), wearing data gloves on both hands which measured thumb, index and middle finger bending, and 3D forearm movements. Real arm and hand movements controlled on-screen virtual arms; the scaling of the real movements onto the virtual arms was therapist-adjustable. Three games provided intensive and entertaining training of reaching, grasping and hand opening. An independent examiner assessed during a 2-week baseline, weekly during intervention, and at 3-month follow-up: Goal Attainment Scale (GAS), Chedoke Arm and Hand Inventory (CAHAI), Chedoke McMaster Stroke Assessment (CMSA), Extended Barthel Index (EBI), fMRI (pre and post-treatment).
Results:
Patient 1 (male 67y, 3.5y after stroke onset, EBI 60) executed 5478 grasping movements with his paretic arm during training. Improvements in CAHAI (+4) and GAS (+2) were maintained after 3 months.
Patient 2 (male 50y, 3y after onset, EBI 64) executed 9835 grasps with his paretic arm. Improvements in CAHAI (+13) and GAS (+2) were also maintained after 3 months. No change was seen in EBI or CMSA for either patient. Both patients remained highly motivated during the course of therapy.
Conclusion: The intervention showed to be a motivating, repetitive, and intense adjunct therapy in chronic stroke patients.

P2639

Is there a rationale for botulinumtoxin booster injections in the treatment of focal spasticity? A case presentation

K. Fheodoroff
Neurorehabilitation, Gailtal-Klinik, Hermagor, Austria

Background: Botulinumtoxin A (BoNT-A) has been proven as a safe and effective therapy for focal spasticity if delivered properly. Due to antigenicity booster injections should be avoided earlier than 8 weeks after last application.
Objective: To stimulate discussion of situations when booster injections may be necessary despite the risk of inducing neutralizing antibodies.
Method: Single case presentation of a 35-year-old woman suffering from consequences of communicans anterior aneurysm-bleeding in April 2009. Within 3 months she developed a severe spastic footdrop. Therefore she was treated with Botox® 300U (gastrocnemius, biceps femoris) prior to admission to inpatient-rehabilitation without influencing ankle plantarflexion. She was still at high risk for developing fixed ankle contracture limiting early verticalisation and gait training. So we decided to re-inject soleus, semimembranosus and toe flexor muscles 4 weeks after first injection using Xeomin® 200U (due to the lack of complexing proteins).
15 weeks later another chemodenervation (Xeomin® 300U) was performed to maintain ankle dorsiflexion. Additionally we injected corrugator muscles as a proof of neutralizing antibodies.
Results: After the booster injection spastic footdrop decreased and gait training could take place. After third injection and a comprehensive rehabilitation program she regained indoor-walking with a rollator and left ankle-foot-orthosis. Brow frowning disappeared after third injection indicating absence of neutralizing antibodies.
Discussion: Booster injections may be helpful in carefully selected situations of focal spasticity at high risk for developing fixed contractures. In this case Xeomin® did not induce neutralizing antibodies after correcting insufficient muscle selection for chemodenervation with Botox®.

P2640

The effects of cycloergometer training on aerobic capacity and walking performance after stroke

F. Degache[1], A. Courbon[2], F. Roche[3], P. Calmels[2]
[1]Jean Monnet University, [2]Physical Medicine and Rehabilitation Unit, [3]Clinical Physiology and Exercise Unit, Saint-Étienne, France

Background: After stroke, the early and persistent decline in aerobic capacity leads to diminished walking capacities. The aim of the study was to investigate the effects of aerobic cycloergometer training on the walking performances in chronic stroke survivors.
Method: A prospective design was used. 14 patients whose stroke had occurred more than three months and less than two years ago performed an aerobic training session with a cycloergometer for 8 weeks. A maximal exercise test, a 6-min walking test, a 20 meters test and an isokinetic muscle strength test were realized before and after training session.
Results: There was a significant increase after aerobic training in maximal power (Pmax) (mean 23.2%, $p<0.0001$), in VO2peak (mean 14.8%, $p=0.04$), and in the knee extension and flexion muscle peak torque on the non-paretic side at 60°/sec and 120°/sec in isokinetic mode (mean from 13.2% to 25.1%, from $p=0.019$ to $p=0.0007$) and in the walking performances on the 6-min walk test (mean 15.8%, $p=0.0002$).
Conclusion: Patients with chronic stroke improved both aerobic and walking performances after aerobic cycloergometer training. Although these results must be interpreted with caution considering the small size of our sample, but they suggest that aerobic training is a safe and potentially effective training after stroke and an alternative to walking treadmill training.

P2641

Impact of interval aerobic training on long-term lower limb muscle strength in chronic stroke patients

F. Degache[1], P. Edouard[2], P. Calmels[2]
[1]Jean Monnet University, [2]Physical Medicine and Rehabilitation Unit, Saint-Étienne, France

Background and purpose: To evaluate the efficacy of supervised high-intensity interval aerobic training (IAT) on lower extremity strength, function, and disability in long-term stroke survivors.
Methods: 10 volunteers aged 53.7±8.6 years and above 12.1±7.5 months after a single mild to moderate stroke, were included into a group that received an 8-week supervised interval aerobic training program consisting of cycling for 4 minutes at 40% of the maximal workload and 1 minute at 80% for 30 minutes. Quadriceps muscle strength was assessed using isokinetic dynamometer.
Results: The results show a significant improvement of extensor and flexor strength at 60°.s-1, and flexor strength at 120°.s-1 in NP limb just after training.
After 6 months post-training, the results show significant increase of muscle strength at all angular velocities and for extensor and flexor muscle and for both limbs, but without improvement for extensor muscle of NP limb at 60°.s-1.
Discussion: A supervised high-intensity interval aerobic training increases muscle strength in non paretic limb. Cycloergometer for training leads a maximal activity of non paretic limbs to compense a non activity of paretic limb. But after 6 months without training session, daily activities increases muscle strength in paretic limbs without significant improvement of muscle strength in non paretic limb.
Conclusions: A supervised high-intensity interval aerobic training could have long-term benefits on muscle strength of lower limbs in hemiplegic patients.

P2642

Intravenous injection of human umbilical cord matrix stem-cell (Wharton jelly stem-cell) provides functional recovery in a rat model of traumatic brain injury

M. Marzban
Iran University of Medical Science, Tehran, Iran

Objective: This study was designed to examine the effects of human umbilical cord matrix stem-cell (hUCMSC) administration in rats for 6 week after traumatic brain injury (TBI).
Methods: Adult male Wistar rats (n=30) were injured with controlled cortical impact device and divided into three groups. The treatment groups (n=10 each) were injected with 2×106 intravenously and whicle group (n=10) received phosphate buffered saline (PBS) whereas the control group (n=10) receive nothing. All injections were performed 1 day after injury into the tail veins of rats. All cells label with Brdu before injection into the tail veins of rats. Neurological functional evaluation of animals was performed before and after injury using Neurological Severity Scores (NSS). Animals were sacrificed 6 week after TBI and brain sections were stained by Brdu immunohistochemistry.
Results: Statistically significant improvement in functional outcome was observed in treatment groups when compared with control ($p<0.01$). This benefit was visible 1 week after TBI and persisted until 6 week (end of trial). Histological analysis showed that (hUCMSC) were present in the lesion boundary zone at 6 week with all cell injected animal.
Conclusion: hUCMSC injected rats after TBI survived until week 6 and provided functional benefit.

P2643

Analysis of outcomes following traumatic brain injury in older patients: incidence and mortality

I.B. Chang[1], S.K. Ahn[1], J.H. Song[1], S.H. Park[2]
[1]Department of Neurosurgery, Hallym University Medical Center, Anyang, [2]Department of Neurosurgery, Hallym University Medical Center, Seoul, Republic of Korea

Objective: As the proportion of older adults in Korea increases, the number of patients of traumatic brain injury (TBI) is rising steadily. The authors reviewed older patients (≥65 years) with TBI and wanted to describe mechanism of injury and outcomes following TBI.
Methods: Between January 2006 and December 2008, 243 older patients (≥65 years) were admitted for TBI. Of them, 234 patients were enrolled in this study. 73 were female and 161 male. Their medical and radiological records were reviewed retrospectively.
Results: The mechanism of injury consisted of 125 slips, 22 pedestrian TAs, 15 motorcycle accidents, 12 falls, 10 bicycle accidents, 7 collisions, 3 in car TAs, and 39 others. Most frequent diagnosis was acute or chronic subdural hematoma, and followed by traumatic subarachnoid haemorrhage, traumatic intracerebral haemorrhage, epidural hematoma and concussion. Using Glasgow Outcome Scale (GOS), 171 patients (73.1%) had good outcomes (GOS 4-5) and 32 patients (13.7%) had fair or poor outcomes (GOS 2-3), and 31 patients (13.2%) died (GOS 1). Most frequent cause of death was slip followed by pedestrian TA.
Conclusion: In our study, older patients accounted for 11.9% of moderate and 13.7% of severely injured patients, respectively. Although high energy mechanisms were responsible for the mortality, relatively minor trauma like slip became the major causes of death in older patients.

P2644

Rates of anxiety and depression among patients of traumatic brain and spinal cord injury

M.M. Zubair[1], S. Bashir[1], J. Ashraf[2], M.A. Saleem[1], M.A. Sheikh[1]
[1]Dow University of Health Sciences, [2]Neurosurgery, Civil Hospital, Dow University of Health Sciences, Karachi, Pakistan

Objective: To estimate rates of anxiety and depression in traumatic brain and spinal cord injury patients
Materials and methods: This case-control study was conducted in a public sector hospital in Karachi, with a sample of 295 (101 cases and 194 controls) and a case control-ratio of 1:2. Patients of brain and spinal injury were enrolled from the neurosurgery outpatient department. Their relatives were taken as controls and matched through gender. Questionnaire based interviews were conducted. Anxiety and depression scores were calculated with a locally designed and verified physician assessing Aga Khan University Anxiety and Depression Scale (AKUADS). SPSS 16.0 was used for data entry and analysis.
Result: Mean age of subjects was 36.63±13.58. Fall was the most common cause of injury and more than 50% of cases suffered from traumatic spinal cord injury. Rates of anxiety and depression were 48.5% in cases as compared to only 34.5% among controls. People suffering traumatic brain or spinal cord injury are likely to develop depression and anxiety following traumatic brain or spinal cord injury. (OR=1.7862, 95% CI = 1.0945-2.9149). Trauma to the spine was more important for anxiety and depression which were seen in 42.5% (17 out of 40) cases of head trauma while 51.9% (28 out of 54) cases of spinal trauma.
Conclusion: Males appear to be at higher risk of injury related depression as compared to females. Anxiety and depression are more likely to develop following spinal cord injury as compared to traumatic brain injury.

P2645

Alterations of zinc homeostasis and proinflammatory cytokines production in rats following traumatic spinal cord injury

W. Jin, H. Ni, W. Liang
Neurosurgery, Drum Tower Hospital, Medical School of Nanjing University, Nanjing, China

Aim: Labile zinc is the essential trace element that facilitates coordination of inflammation and immunity in many pathophysiological processes. The present study aimed to investigate the effects of traumatic spinal cord injury (SCI) on the levels of labile zinc and proinflammatory cytokines in rats.

Methods: Adult male Sprague-Dawley rats were divided into six groups: control group with sham operation and SCI groups at hours 6, 24, 48, 72, and 168 (12 rats in each group). SCI was created extradurally with an aneurysm clip at the T8-T9 level. All rats were decapitated at corresponding time point and injured spinal segment samples were taken. We measured spinal labile zinc by N-(6-Methoxy-8-quinolinyl)-4-methylbenzenesulfonamide (TSQ) fluorescence staining, proinflammatory cytokines such as tumour necrosis factor-α (TNF-α), interleukin-1β (IL-1β) and interleukin-6 (IL-6) by enzyme-linked immunosorbent assay (ELISA) and spinal cord water content by wet/dry weight method.

Results: SCI caused a gradual increase of spinal labile zinc with the maximum at 24h. The concentrations of TNF-α, IL-1β and IL-6 were significantly increased postinjury and maximal at 24h, 24h and 72 h respectively. The spinal cord exhibited oedema postinjury and became more severe at 72h. There were highly positive correlations between the spinal accumulation of labile zinc and levels of proinflammatory cytokines.

Conclusions: Traumatic SCI could induce the increases of labile zinc and proinflammatory cytokines in the injured rat spinal segment, which might participate in the pathogenesis of traumatic SCI.

Keywords: labile zinc, proinflammatory cytokines, spinal cord injury

P2646

Voiding dysfunction after brain injury

Y.G. Park, S. Kim, G. Jung
Rehabilitation Medicine, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Republic of Korea

Objectives: Voiding dysfunction is common in brain injury including traumatic and non-traumatic brain injury and is a strongly negative prognostic factor. This study aims to investigate the prevalence and patterns of voiding dysfunction, and assess its related factors and quality of life (QoL).

Methods: We studied 211 acquired brain injury patients (male 130, female 81) who admitted to rehabilitation unit of four different hospitals in Seoul, South Korea. Voiding function was evaluated with the Korean version of International Prostate Symptom Score (IPSS) and voiding diary. The cognitive function was assessed using Korean version of Mini Mental Status Examination (MMSE-K). We excluded patients that had previous urologic and gynaecologic problems.

Results: Overall, 47% (100 out of 211) of the patients had voiding dysfunction. The most common symptom was nocturia in 70%, which was followed by frequency in 65% and urgency in 41% of the patients. There were no significant differences of sex, cause of brain injury and lesion site between continent and incontinent patients. Patients with incontinence symptom had lower MMSE-K scores than those with continent symptom. The QoL score showed a high correlation with the total IPSS score ($p < 0.05$). Logistic regression analyses showed that both obstructive and irritative symptom were significant predictors for dissatisfaction in QoL.

Conclusion: The prevalence of voiding dysfunction is high in brain injury, especially in impaired cognition cluster. In addition, voiding dysfunction has significant influence on the perceived quality of life in survivors of brain injury.

P2647

Neurosyphilis: the great mimicker returns

M. Grunho, J. Coimbra, I. Mendes, A. Silvestre, C. Guarda
Neurology Department, Hospital Garcia de Orta, Almada, Portugal

P2648

Toxoplasma encephalitis in a immunocompetent patient with normal brain MRI findings: a case report

P. Slankamenac[1], V. Suknjaja[1], L. Sakalas[1], J. Vukadinov[2]
[1]Institute of Neurology, Clinical Center of Vojvodina, [2]Clinic for Infectious Disease, Clinical Center of Vojvodina, Novi Sad, Serbia

P2649

Abstract cancelled

P2650

Syringomyelia associated with syphilitic spinal meningitis: real complication or possible association?

Y. Mebrouk, M. Chraa, N. Kissani
Neurology Department, University Hospital Mohamed VI Marrakech, Marrakech, Morocco

P2651

Prophylaxis of the onset of stroke/TIA against a background of herpes infection

N. Turchina, K. Antonenko
Neurological, National O.O. Bogomolets University, Kiev, Ukraine

P2652

Acute myelitis complicating primary varicella infection

E. Papageorgiou, S. Filippidou, I. Markakis, I. Xydakis, G. Gkekas
Neurology, "St. Panteleimon" General State Hospital of Piraeus, Nikaia, Greece

P2653

Neurological features as presenting manifestations of brucellosis

N. Ben Ali, H. Mrabet Khiari, S. Echebbi, A. Mrabet
Neurological Department, Charles Nicolle Hospital, Tunis, Tunisia

P2654

Central pontine myelinolysis complicating treatment of Visceral Leishmaniasis

A. Al Mamoon[1], O. Seidi[2]
[1]Internal Medicine, Soba University Hospital, [2]Internal Medicine, Faculty of Medicine/ University of Khartoum, Khartoum, Sudan

P2655

Cerebral air embolism from internal jugular vein catheterization in patients with patent foramen ovale, treated with hyperbaric oxygen therapy

P.K. Loh, E.P. Wilder-Smith
Neurology Division, Department of Medicine, National University Hospital, Singapore

P2656

Lance-Adams syndrome in a psychiatry ward

C. Nóbrega[1], A. Ramos[2], I. Henriques[1], R. Almeida[1], R. Pedrosa[1]
[1]Centro Hospitalar de Lisboa Central, EPE, [2]Centro Hospitalar Psiquiátrico de Lisboa, Lisbon, Portugal

P2657

Principal component analysis and acute physiology score in traumatic brain injury - does age matter?

G.K. Matis[1], A. Kiriakidou[2], O.I. Chrysou[1], D. Peios[1], I. Moralis[1], K. Kontogiannidis[1], N. Lyratzopoulos[1], G. Tsivgoulis[3], T.A. Birbilis[1]
[1]Department of Neurosurgery, Democritus University of Thrace, Medical School, Alexandroupolis, [2]Department of Neurology, Aristotle University, Medical School, Thessaloniki, [3]Department of Neurology, Democritus University of Thrace, Medical School, Alexandroupolis, Greece

P2658

Management strategies of brain lesions presenting as emergency during pregnancy

S. Elwatidy[1], Z. Jamjoom[1], E. Elgamal[1], A. Abdelwahab[2]
[1]Neurosurgery, [2]Obs & Gyn, King Saud University, Riyadh, Saudi Arabia

P2659

A case of mucormycosis presenting with total ophthalmoplegia and peripheral facial palsy

A. Ertekin, R. Aygul, G. Özdemir, D. Kotan, H. Ulvi
Atatürk University, Erzurum, Turkey

P2660

The role of physical therapy in management of parkinsonism patients with osteoarthritis of the knee

A.M. Bumbea[1], R. Traistaru[2], R. Popescu[2]
[1]Medical Rehabilitation, [2]University of Medicine and Pharmacy, Craiova, Romania

P2661

Assessing motor impairment of trunk for people with neuromuscular disease: reliability and validity of Trunk impairment Scale (TIS) and Trunk Control Test (TCT)

Y.P. Demir, E. Doğru, S.A. Yılmaz, S.A. Yıldırım
Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey

P2662

Monitoring the rehabilitation programme in spinal cord injury

E.I. Paun[1], L.D. Rusu[1], P.A. Rusu[2]
[1]Sports Medicine and Rehabilitation, [2]Mechanic Department, University of Craiova, Romania

P2663

Recovery of post-stroke depression after rehabilitation affected the cognitive improvement, not functional improvement in chronic stroke patients

B.S. Kwon[1], D.J. Jun[2]
[1]Rehabilitaion Medicine, Dongguk Univ-Seoul, Graduate School of Medicine/ Dongguk Univ-Ilsan Hospital, Koyang-shi, [2]Rehabilitation Medicine, Dongguk Univ-Seoul, Graduate School of Medicine/ Dongguk Univ-Bungdang Hospital, Sungnam, Republic of Korea

P2664

Assessment of health related quality of life (HRQOL) in migraine patients: two different scales, two different results?

E. Ayvat, M. Kılınç, D. Gürbüz, M. Atasay, S.A. Yıldırım
Physical Therapy and Rehabilitation, Hacettepe University, Ankara, Turkey

P2665

The evaluation of transcutaneous electrical nerve stimulation (TENS) as a treatment of neck pain due to musculoskeletal disorders

M. Maayah[1], M. Al-Jarrah[2]
[1]Jordan University of Science and Technology, [2]Physiotherapy Department, Jordan University of Science and Technology, Irbid, Jordan

P2666

Comparison of the results of early rehabilitation and treatment of stroke patients with and without diabetes

S. Svalina[1], B. Kovac[1], B. Kovac[2], S. Majski[1], V. Kerek[1], A. Simic[1], A. Duic[1], S. Pudas Tomljenovic[1]
[1]Neurology, General Hospital Vukovar, Vukovar, [2]Anestehesiology and Intensive Care, University Hospital Osijek, Osijek, Croatia

P2667

Physical performance and incidences of fall of patients with spinal cord injury 6 months after discharge

S. Amatachaya[1], J. Wannapakhe[2], W. Siritaratiwat[2], P. Arrayawichanon[3]
[1]Physical Therapy, [2]Physical therapy, [3]Physical Medicine and Rehabilitation, Khon Kaen University, Meoung, Thailand

P2668

Comparison of orthoses compliance in obstetric brachial plexus and cerebral palsy: a pilot study

B. Dilek, G. Gur, Y. Yakut, F. Uygur
Hacettepe University, Ankara, Turkey

P2669

Abstract cancelled

P2670

Raising the effectiveness in implementing the protocol for the rehabilitation of incipient Alzheimer's cases by means of subclinical modafinil action

L.M. Sanchez[1], W. Lalinde[2], J.D. Garcia[3], P.D.C. Tudor[3], J.A. Villarreal[4]
[1]Biology, Science and Technology Faculty, Autonomous University of Entre Rios, Concepción del Uruguay, Argentina, [2]Research Group on Biomedical Informatics, IMIM/UPF Parc de Recerca Biomèdica de Barcelona, Barcelona, Spain, [3]Demencias, [4]Dementia, Neuro-Psycho-Ethology Research Center, Concepción del Uruguay, Argentina

P2671

Eating disorders and/or negative mood disturbance - underdiagnosed factors for worse rehabilitation in ischemic and hemorrhagic stroke

S.M. Nica[1], G. Mihailescu[1], I.E. Davidescu[1], S.C. Nica[2]
[1]Neurology, Carol Davila University of Medicine and Pharmacy, [2]Dermatology, Colentina Clinical Hospital, Bucharest, Romania

P2672

The effectiveness of physical rehabilitation on quality of life and fatigue in multiple sclerosis

D. Dobi[1], M. Kapisyzi[1], S. Mijo[1], I. Zekja[2], J. Kruja[1]
[1]Dept. of Neurology, UHC Mother Theresa, [2]Faculty of Nursing, University Tirana, Albania

P2673

The long-term results of rehabilitation of multiple sclerosis patients

V. Smychek[1], A. Filippovich[2], I. Chapko[1]
[1]Institute of Medical Assessment and Rehabilitation, [2]Research Institute of Medical Assessment and Rehabilitation, Minsk, Belarus

P2674

Effect of neurodevelopmental training in static and dynamic balance of stroke survivors

D. Dobi, M. Kapisyzi, Z. Papadhopulli, J. Kruja
Dept. of Neurology, UHC Mother Theresa, Tirana, Albania

P2675

Three-level diagnostic algorithm for expert evaluation of rehabilitation potential and rehabilitation prediction (of disorders, vital activity limitations, social deficiency) for multiple sclerosis patients

A. Filippovich, I. Chapko
Research Institute of Medical Assessment and Rehabilitation, Minsk, Belarus

P2676

Recovery of motor deficits in patients with depression and ischemic stroke

C. Zaharia, V. Tudorica, D.F. Pirscoveanu
University of Medicine and Pharmacy, Craiova, Romania

P2677

Functional outcome after thrombolytic therapy in stroke

D. Prtina[1], S. Miljkovic[2]
[1]Institute for Rehabilitation 'Dr Miroslav Zotović', [2]Neurology, KBC Banja Luka, Bosnia-Herzegovina

P2678

The short- and long-term effects of a pelite insert in traumatic brain injury: a case study

G. Gur[1], S. Erel[2], B. Dilek[1], E. Simsek[1], N. Bek[1], Y. Yakut[1], F. Uygur[1]
[1]Hacettepe University, Ankara, [2]Pamukkale University, Denizli, Turkey

P2679

The effect of depression on activities of daily living (ADL) in patients with Parkinson's disease dementia (PDD)

J. Jansa, D. Georgiev, M. Trost, Z. Pirtosek, M. Kramberger Gregorič
Neurology, University Medical Centre Ljubljana, Slovenia

P2680

Bilateral abducens palsy associated with dural CSF fistula

J. Marques[1], A. Timoteo[2], V. Silva[1], R. Simoes[2], T. Palma[2], A. Serafim[3], R. Ginestal[2]
[1]Instituto Português de Oncologia de Lisboa Francisco Gentil, Lisbon, [2]Hospital Professor Doutor Fernando Fonseca, EPE, Amadora, [3]Centro Hospitalar de Lisboa Ocidental, Lisbon, Portugal

P2681

Acute interhemispheric subdural hematoma

P. Bernsen[1], H. Bernsen[2], P. Van Vierzen[3]
[1]Neurology, St. Jansdal Hospital, Harderwijk, [2]Neurology, Canisius Wilhelmina Hospital, Nijmegen, [3]Radiology, St. Jansdal Hospital, Harderwijk, The Netherlands

P2682

Os odontoideum with a cervical myelopathy

I. Son[1], J. Jeong[1], S. Cho[2]
[1]1Department of Neurology and Inam Neuroscience Research Center, Sanbon Medical Center, Wonkwang University, Gunpo-si, [2]Department of Neurology, Sung-Ae Hospital, Youngdengpo-gu, Republic of Korea

Neurogenetics; neuroepidemiology

P2683

Clinical manifestations of Alexander's disease in Japan

T. Yoshida[1], M. Sasaki[2], M. Yoshida[3], M. Namekawa[4], Y. Okamoto[5], S. Tsujino[6], H. Sasayama[1], M. Nakagawa[1], the Alexander Disease Study Group
[1]Department of Neurology, Kyoto Prefectural University of Medicine, Kyoto, [2]Department of Child Neurology, National Center Hospital of Neurology and Psychiatry, Tokyo, [3]Department of Neuropathology, Institute for Medical Science of Aging, Aichi Medical University, Aichi, [4]Department of Neurology, Jichi Medical University, Tochigi, [5]Department of Neurology and Geriatrics, Kagoshima University Graduate School of Medicine and Dental Sciences, Kagoshima, [6]Department of Rehabilitation, Osaka General Medical Center, Osaka, Japan

Background: Alexander's disease (AxD) is a rare neurodegenerative disease resulting from mutations in the gene encoding glial fibrillary acidic protein (GFAP). The formation of Rosenthal fibres, which mainly consist of GFAP in the cytoplasm of astrocytes, is characteristic of AxD pathology. The detailed clinical characteristics remain unknown, particularly in Japan. The present study aimed to document clinical manifestations of AxD in Japan and propose criteria for diagnosis.

Methods: Information patients with AxD accompanied by neurological manifestations as well as their MRI findings, neurophysiological findings, GFAP mutation and pathological findings was obtained from neurologists and neuropaediatricians in 33 hospitals in Japan.

Results: Clinical data from 37 cases, comprising 10 of infantile onset, 8 of juvenile onset, 17 of adult onset and 2 asymptomatic cases, were described in detail. Infantile onset AxD was characterized by abnormal signs mainly in the cerebrum, such as convulsion, macrocephaly, spasticity, symmetrical cerebral white matter abnormalities with frontal predominance on MRI and electroencephalogram abnormality. Adult onset AxD was characterized by abnormal signs mainly in the brainstem and cervical cord, such as bulbar signs, muscle weakness, spasticity, sphincter abnormalities, abnormalities in the medulla oblongata and cervical cord on MRI, and an abnormal auditory brainstem response. In almost all cases for which GFAP gene analysis was performed, a heterozygous missense nucleotide change in the GFAP, mainly in the rod domain, was noted. Pathological examination was performed in 3 cases.

Conclusion: The clinical characteristics of AxD in Japan reported here suggest tentative criteria for the clinical diagnosis of AxD.

P2684

A novel mutation at the voltage-gated sodium channel gene SCN4A-exon-23 (4126C>T) causes the syndrome of myopathy, ataxia, mental retardation, and epilepsy (MAME)

P. Thajeb[1,2,3], C.-F. Lee[4], R. Harrigan[2], L.-P. Lai[4]
[1]Medical Department, China Medical University Hospital, Taipei City, Taiwan R.O.C., [2]Graduate Division, Biomedical Science, John A Burns School of Medicine, Honolulu, HI, USA, [3]Faculty of Medicine, National Yang-Ming University School of Medicine, Taipei City, [4]Department of Internal Medicine (Cardiology), National Taiwan University Hospital, Taipei, Taiwan R.O.C.

Sodium channel (SCN) gene mutations may cause a wide spectrum of neurologic and cardiologic disorders. The neurological disorders range from epileptic syndromes, such as febrile convulsion and generalized idiopathic epilepsies, to the classic muscle sodium-channel disorders, such as prolonged-QT syndrome, myotonia, paramyotonia congenita, and periodic paralysis. SCN4A mutations have been reported to cause a myasthenic syndrome, a fluctuating cold- and exercise-induced stiffness without paramyotonia, or periodic paralysis.

We herein report a 26-year-old single lady of Han's Chinese/Taiwanese descendent, with a unique syndrome of slowly progressive myopathy, ataxia, mental retardation, and epilepsy (MAME) since early childhood. Myotonia was absent, and electrocardiogram was normal. She had associated persistent high plasma levels of CPK, normal plasma potassium levels and lactate/pyruvate ratio, evidence of cerebellar atrophy on neuroimaging studies, polyspikes-and-wave complexes on EEG, and subnormal intellectual functions on cognitive function tests. Genotyping of the proband and her parents were performed after informed consents and approvals from local IRB. Screening for common mitochondrial DNA (mtDNA) mutations and deletions showed wild type of mtDNA. Genotyping of the SCN4A gene and the chloride channel gene CLCN1 from the patient's genomic DNA showed a novel mutation at nucleotide position of 4126C>T substitution of SCN4A-exon 23, alpha subunit. The mutation causes amino acid substitution Asn1376Asp that changes the trans-membrane domain of the sodium channel, and therefore alters the sodium conductance. To the best of our knowledge, this is the first report on SCN4A-exon 23 mutation in Han's Chinese/Taiwanese that causes a rare neurological disorder called MAME.

P2685

Description of a four-generation family with autosomal dominant cerebellar ataxia: clinical and genetic analysis

D. Italiano[1], F. Annesi[2], A. Laganà[3], G. Provenzano[2], P. Tarantino[2], A. Gambardella[2,4], G. Annesi[2], A. Quattrone[2,4], P. Bramanti[1]
[1]IRCCS Centro Neurolesi 'Bonino-Pulejo', Messina, [2]Institute of Neurological Sciences, National Research Council, Mangone (Cosenza), [3]Department of Neurosciences, of Psychiatric and Anaesthesiological Sciences, University of Messina, Messina, [4]Institute of Neurology, University Magna Graecia, Catanzaro, Italy

Introduction: Autosomal dominant cerebellar ataxias (SCAs) are a group of neurodegenerative disorders characterized by imbalance, dysarthria, and progressive gait and limb ataxia, which are variably associated with other neurological signs. To date, about 29 genetic loci associated to Mendelian forms of SCA are known, and several SCA genes have been identified. We performed a genetic analysis of a four-generation family from southern Italy, with slowly progressive SCA.
Patients and methods: 14 subjects (seven affected) in a family with 15 affected members have been evaluated. The disease seems to display an autosomal dominant pattern of inheritance with elevated penetrance. The mean age at onset was 34 years with a strong evidence of anticipation across generations. The first symptoms were invariably "legs heaviness", imbalance, or dysartria. Neurological examination in the advanced state of disease showed in all patients unbalanced standing, gait and limb ataxia and dysmetria. We performed mutational analysis by PCR searching for the most common SCA mutations.
Results: Mutational analysis excluded pathological repeat expansions in the SCA 1, 2, 3, 6, 7, 8, 12, 17 and DRPLA genes. Linkage exclusion tests showed no evidence of association with most of known mapped SCA loci (SCA4, SCA5, SCA13-16, SCA19-22, SCA25 and SCA27-29).
Conclusion: In this large family, mutational analysis excluded the presence of all the main common SCA mutations, and linkage analysis ruled out the association with most of the so far reported SCA genetic loci. Genome-wide analysis will be performed, hopefully leading to the identification of a new SCA locus.

P2686

Hereditary spastic paraplegia in Egypt: clinical and genetic heterogeneity

M.S. Zaki[1], M.Y. Eissa[1], A.K. Abdel Aleem[2], L. Mansour[3], J.C. Tolentino[4], J.L. Silhavy[4], J.G. Gleeson[4]
[1]Clinical Genetics Department, Human Genetics and Genome Research Division, [2]Molecular Genetics Department, Human Genetics and Genome Research Division, National Research Centre, [3]Neuropediatrics Department, Cairo University, Cairo, Egypt, [4]Neurogenetics Laboratory, Howard Hughes Medical Institute, Department of Neurosciences, University of California San Diego, CA, USA

Hereditary spastic paraplegia (HSP) is characterized by progressive spasticity of the lower limbs that can be inherited in an autosomal recessive, autosomal dominant or X-linked manner. The heterogeneity of the disease is not only demonstrated by the various forms of HSP, but also by the numerous HSP loci that have already been identified. We have recruited 73 patients from 28 Egyptian families with complicated or uncomplicated forms of recessive HSP to identify additional HSP loci. One of these families with apparent X-linked inheritance displayed a mutation in PLP1 gene. We excluded linkage to known loci in 15 families, which were subsequently evaluated by genome-wide 5K SNP linkage scan to identify new loci. Positive consanguinity was in 26 families (92.85%); and patients' age ranged from 2 years to 40 years. The onset varied from 1 year to 18 years and complicated HSP was in 17 families. The only presenting symptom in uncomplicated HSP was spasticity of lower limbs while in complicated HSP there were variable manifestations in the form of dysarthria, mental retardation, nystagmus, peripheral neuropathy and acropathy with self mutilation that was excluded from linkage to Cct5 gene. Neuroimaging findings were thin corpus callosum, defective myelination, cerebellar atrophy and retrocerebellar cyst. Our analysis revealed that 8 families defined novel HSP loci, and 2 families mapped to known loci. These results demonstrate the genetic heterogeneity of the disease and that there are still many more causes yet to be explored. Our cohort shows the likelihood of identifying more novel HSP genes.

P2687

Erythropoietin in patients with Friedreich's ataxia: results of a randomized, double-blind, placebo-controlled, dose-finding clinical trial

C. Mariotti[1], R. Fancellu[1], S. Caldarazzo[1], A. Solari[1], L. Nanetti[1], C. Tomasello[1], D. Di Bella[1], M. Plumari[1], G. Lauria[1], M.D. Cappellini[2], F. Taroni[1]
[1]*Fondazione IRCCS-Istituto Neurologico Carlo Besta,* [2]*Fondazione IRCCS Policlinico, Mangiagalli, Regina Elena, Milan, Italy*

Aims: Friedreich's ataxia (FRDA) is a rare genetic disorder caused by reduction of frataxin protein. Recent evidences demonstrated that recombinant human erythropoietin (rhuEPO) increases frataxin levels in lymphocytes of FRDA patients. Aims of our study were:
1) assess safety of chronic rhuEPO administration;
2) determine efficacy of rhuEPO in increasing frataxin levels in lymphocytes;
3) determine minimal effective dose.
Methods: 16 adult FRDA patients were randomly assigned to rhuEPO (n=11) or placebo (n=5). During the first 6 months, 3 consecutive cycles of rhuEPO i.v., ranging from 20,000 to 40,000 IU every 2 weeks, were performed. In a second phase, the patients were treated for 6 months with rhuEPO subcutaneously. All patients also received Idebenone 5mg/Kg/day. Neurological examinations were performed at enrolment and after each treatment phase. Skin biopsies were performed at enrolment and at end of the study.
Results: Patients consisted of 9 women and 7 men. Mean age was 28.1±5.5 years. At baseline, level of frataxin protein in peripheral lymphocytes was 25.7%±10.7 of normal controls. During the treatment no serious adverse event occurred. After each cycle of treatment, the levels of frataxin protein in lymphocytes remained unchanged both in the group of the patients assigned to rhuEPO and in the patients assigned to placebo.
Conclusions: Our preliminary results indicate that the doses and the drug schedules adopted during the different periods of the study were safe, but not effective in increasing the levels of frataxin protein in lymphocytes of FRDA patients.
[AIFA-grant FARM6H95MJ to FT]

P2688

Genetic analysis of the MAPT locus in multiple system atrophy

A. Sailer[1], C. Paisa-Puiz[1], A. Li[1], R. Paudel[1], S.W. Scholz[2], Z. Ahmed[1], T. Revesz[1], C.J. Mathias[1], N.W. Wood[1], J. Holton[1], J. Hardy[1], H. Houlden[1]
[1]*Institute of Neurology, London, UK,* [2]*National Institute of Health, Bethesda, MD, USA*

Background: Tau has been implicated in a number of neurodegenerative disorders and genetic variation at the MAPT locus increases the risk of developing these diseases. Common variants in the MAPT locus are associated with increased risk for Parkinson's disease (PD). Multiple system atrophy (MSA) and PD are both progressive neurodegenerative disorders with overlapping clinical, biochemical and genetic features. In this study we investigate whether genetic variation in the MAPT gene locus also contributes to MSA pathogenesis.
Methods: Mutational analysis of the MAPT gene through Sanger sequencing was performed in a collection of 216 MSA patients. The MAPT H1/H2 haplotype was assessed by frequency analysis of exonic SNPs that are in high linkage disequilibrium with the respective haplotypes.
Results: Two coding mutations in exon 7 of the MAPT gene were identified (p.A123T and a p.A149T). We screened 196 controls for mutations in this exon and found that the p.A149T mutation was also present in one control. The p.A149T mutation was previously described as non-pathogenic in the literature. The H2-haplotype frequency was 0.21 and not significantly different from controls.
Conclusion: A comprehensive mutational screening of the MAPT gene identified no pathogenic mutations in MSA cases. The H1/H2 haplotype frequencies did not differ significantly between MSA cases and controls. Our results indicate that neither rare nor common genetic variants at the MAPT locus play a critical role in the pathogenesis of MSA.

P2689

Charcot-Marie-Tooth disease (CMT) caused by a novel copy-number variation (CNV) in the MPZ gene

H. Høyer[1], A.K. Eek[1], M.B. Russell[2,3], G.J. Braathen[1,2,3]
[1]Department of Laboratory Medicine, Section of Medical Genetics, Telemark Hospital, Skien, [2]Head and Neck Research Group, Research Centre, Akershus University Hospital, Lørenskog, [3]Faculty Division Akershus University Hospital, University of Oslo, Nordbyhagen, Oslo, Norway

Background: Charcot-Marie-Tooth disease (CMT) is the most common inherited disorder of the peripheral nervous system with an estimated prevalence of 1 in 1,214. CMT is a heterogeneous disorder making classification a challenge. Neurophysiology subdivided CMT into type 1 and 2, depending on whether the median motor conduction velocity (MCV) is less or above 38m/s. A third form has intermediate MCV (25-45m/s). Up to date 43 genes causing CMT have been identified. Duplication of the peripheral myeling protein 22 (PMP22) is the most common cause to CMT, as it accounts for 20-50% of all the CMT cases. To date genetic CMT research has focused on point mutations, while only few studies have investigated the contribution of copy-number variations in CMT genes beside the PMP22 duplication.
Methods: We analyzed CMT patients referred to Telemark Hospital by sequencing analysis supplemented with Multiplex Ligation-dependent Probe Amplification (MLPA) and Array Comparative Genomic Hybridization (ACGH).
Results: Our analysis of the MPZ gene identified a novel CNV in MPZ. The CNV segregated with the CMT phenotype. Thus, our result strongly suggests that the CNV in the MPZ gene is the cause of CMT in this family. Further data, clinical, MPZ sequencing, MLPA and ACGH will be presented at the congress.

P2690

A case of progressive spastic paraparesis, cerebellar ataxia, sensory-motor neuropathy and cognitive decline with thin corpus callosum

R. Geraldes[1], R. Lopes da Silva[2], C. Pereira[3], I. Alonso[3], J. Pinto-Basto[3,4], I. Pavão Martins[1,5]
[1]Neurosciences Department, Santa Maria Hospital, [2]Neuropediatry Department, D. Estefânia Hospital, Lisbon, [3]Center of predictive and Preventive Genetics and UniGENe, Institute of Molecular and Cellular Biology, [4]Institute of Biomedical Sciences Abel Salazar, Oporto University, Oporto, [5]Lisbon Medical School, Lisbon University, Lisbon, Portugal

Introduction: Hereditary spastic paraparesis (HSP) is characterized by progressive lower limb (LL) spasticity and weakness, sometimes with postural hypoesthesia, bladder dysfunction and other neurological signs. Transmission is mainly autosomal dominant. Diagnosing recessive cases is often hard and requires a careful phenotypical analysis.
Case report: A 30-year-old female, born of non-consanguineous parents and no familial neurological disease, presented with a progressive gait disturbance since the age of six. Since adolescence, there was cerebellar ataxia with axial involvement and a progressive cognitive decline, learning impairment, loss of judgement. Recently there is urinary incontinence. Presently she is obese, has a multidomain cognitive dysfunction, scandid voice, spasticity and weakness of the LL, distal atrophy with paresis of the upper limbs (UL) and LL, weak osteotendinous reflexes, bilateral Babinski sign, distal UL and LL pain hypoesthesia, bilateral dysmetria, trunk instability, impossible independent gait. Brain MRI disclosed cortical atrophy, predominantly in the cerebella vermis, and a thin corpus callosum (CC), with absent rostrum. There were bilateral delayed visual latencies and a sensory-motor polyneuropathy on neurophysiological studies. She is a compound heterozygous for mutations in the SPG11 gene (c.6832_6833delAG e delection of exon 31 to 34).
Discussion: One third of patients with autosomal recessive HSP have a thin CC and mutations in the SPG 11 gene. Our patient has several features of HSP 11, described in a Portuguese patient with the c.6832_6833delAG mutation, although a prominent cerebellar involvement was present in our case. Exons 31-34 delection was described in one Dutch patient with no cognitive decline.

P2691

Myopathy and parkinsonism in phosphoglycerate kinase (PGK) deficiency

E. Sotiriou[1,2], P. Greene[1], S. Krishna[1], M. Hirano[1], S. DiMauro[1]
[1]*Columbia University Medical Center, New York, NY, USA,* [2]*251 General Hospital of Hellenic Air Force, Athens, Greece*

We report a 25-year-old man with recurrent exertional myoglobinuria, myalgias and progressive weakness, who had no evidence of haemolytic anaemia, but severe CNS involvement, including developmental delay and parkinsonism responsive to levodopa.
Markedly decreased phosphoglycerate kinase (PGK) activity was documented in muscle and molecular analysis of the PGK1 gene identified a missense mutation, p.378T>P. Interestingly, this same mutation was described as pathogenic in a case with isolated muscle cramps and myoglobinuria, without haemolytic anaemia or brain dysfunction.
PGK plays an important role in the generation of ATP during glycolysis. Among symptomatic patients, two main clinical pictures have emerged: a syndrome characterized by haemolytic anaemia and CNS involvement and a purely myopathic syndrome with exercise intolerance, cramps and recurrent myoglobinuria. Parkinsonism is an uncommon clinical finding in those patients. The diagnosis of PGK deficiency was made in our patient only because he suffered an episode of myoglobinuria but would never have been otherwise considered in any individual in whom the signs of parkinsonism overshadow those of myopathy. These data reinforce the concept that PGK deficiency is a highly heterogeneous disorder and also raises the question of a relationship between PGK deficiency and idiopathic juvenile Parkinson's disease.

P2692

Cross-cultural differences in the symptomatic treatment and prevention of migraine

F.J. Carod-Artal[1], D. Ezpeleta[2], M. Martin Barriga[2], A.L. Guerrero[3]
[1]*Neurology Department, Virgen de la Luz Hospital, Spain,* [2]*Neurology, Gregorio Marañón University General Hospital, Madrid,* [3]*Neurology, University Hospital, Valladolid, Spain*

Objectives: To assess cross-cultural differences in the use of drugs commonly prescribed to treat and prevent migraine attacks.
Methods: Cross-cultural study performed in South America (Brazil) and Europe (Spain). Migraine patients were prospectively recruited in neurology outpatient clinics from Spain and Brazil. Migraine was diagnosed according to International Classification of Headache Disorders. Patients answered a socio-demographic questionnaire that included questions about the use of drugs to treat and prevent migraine attacks.
Results: 292 patients (mean age 34.6 years; 80% females; 52% Spanish) were included. Brazilian patients were significantly younger (33.1 vs. 35.9 years; p=0.03). Their mean age during the first episode was also lower (17.5 vs. 19.8 years; p=0.02). The mean number of migraine attacks during the last month was higher in Brazilian patients (7.3 vs. 3.8; p< 0.001). Analgesics were the most common drugs used to treat migraine attacks in both populations (75.5% vs. 82.9%). Spanish migraineurs managed more commonly triptans that Brazilian patients (47% vs. 16.3%; p<0.0001), whereas Brazilian migraineurs used more frequently analgesics to treat acute attacks (4.6% vs. 22.7%; p<0.0001). Ergotamine was used in similar proportion (4.6% vs. 7.1%). Preventative drugs were prescribed more frequently in Spain (52.9% vs. 21.9%; p<0.0001). Calcium channel blockers (19.2% vs. 8.5%; p=0.01), antidepressants (24.5% vs. 10.6%; p=0.002), beta-blockers (20.5% vs. 5.7%; p=0.004), and anticonvulsants (28.5% vs. 2.8%; p=0.0001) were significantly more used in Spanish migraineurs.
Conclusions: Cross-cultural differences regarding the treatment and prevention of migraine may exist. Infra-utilization of triptans and preventatives was observed in Brazilian migraineurs.

P2693

Multiple sclerosis in Sardinia, insular Italy: the highest burden worldwide?

M. Pugliatti[1,2], P. Cossu[1,2], G. Arru[1], M.I. Pirastru[1], I. Spano[3], S. Traccis[4], G. Rosati[1]
[1]Dept. of Neurosciences, University of Sassari, Sassari, Italy, [2]Dept. of Public Health Care and Primary Health Care, University of Bergen, Bergen, Norway, [3]Health Information System Unit, Sassari Health District, Sassari, [4]Division of Neurology, Ozieri Health District, Ozieri, Italy

Objectives: To determine the current burden of MS in Sardinia, insular Italy, a region at high risk for the disease.
Methods: Age- and gender-specific population-based prevalence and incidence were updated based on data from 40-year MS surveillance in the study area (provinces of Sassari and Olbia-Tempio, pop. ca 481,000). Medical records and district health statistics (hospital discharge ICD9-CM and ticket exemption codes) were scrutinized for the study population. Estimates were based on MS according to Poser et al. criteria.
Results: On prevalence day, December 31st 2008, 1129 individuals suffering from MS (308 men, 821 women) were living in the study area. Crude total prevalence was 234.7 per 100,000 (95%CIs: 230.7, 238.8), 130.3 and 335.7 for men and women, respectively. The respective estimates adjusted for the 2001 Italian population were 222.9, 124.4, 317.5. Prevalence significantly increased from 1971 (13.6) to 2008. Mean age at death also increased from 40.6 (1971) to 58.7 (2008) years (no gender effect). Mean total incidence for the period 2000-2004 was 10.2 per 100,000/year (95%CIs: 8.1, 12.4), 6.2 for men, 14.1 for women. In 1965-2008, mean age at clinical onset increased from 25.5 to 32.1 years with no gender effect; F:M ratio increased from 1.6 to 3.1.
Conclusions: MS burden in Sardinia, insular Italy is to our knowledge the highest worldwide, second to few Canadian ethnicities. It keeps showing a remarkable incremental temporal trend for increasing survival and incidence especially in women.
Acknowledgements: Fondazione Italiana Sclerosi Multipla (2007/R/14; 2008/R/19); Regione Autonoma Sardegna (Assessorato Igiene, Sanità, Assistenza Sociale).

P2694

Estimating the incidence and prevalence of long-term neurological conditions using a primary care research database

T. Hoppitt, C. Sackley, M. Calvert, H. Pall
Primary Care Clinical Sciences, University of Birmingham, Birmingham, UK

Introduction: An up to date robust estimate of the incidence and prevalence of rare long-term neurological conditions in the UK is not available.
Aim: Our aim was to estimate the incidence and prevalence of Motor Neuron Disease (MND) and Multiple System Atrophy (MSA) using a primary care research database, and to compare the results with historical estimates.
Methods: Anonymous patients with READ codes for diagnoses of MND/MSA were identified from The Health Improvement Network (THIN) database. New incident cases (2004 to 2008), and prevalent cases (31st December 2004 to 2008) were identified. Population denominators for each year obtained from THIN and incidence (/100,000 person years) and prevalence (/100,000 of population) were estimated.
Results: MND - incidence range: 2.55 to 3.38; prevalence range: 9.37 to 10.08
MSA - Incidence range: 0.32 to 0.54; prevalence range: 0.68 to 1.19
(Incidence /100,000 person years; prevalence/ 100,000 of population)
Statistics differ to those previously reported in historical studies.
Conclusions: Estimates of the incidence and prevalence of long-term neurological conditions vary. This may reflect methodological challenges in case ascertainment, misdiagnosis and misclassification, and the reporting and updating of medical records.

P2695

Increased neurological adult (aged 45-74) deaths between 1979-2006 in the Western world: diagnostic artefact, Gompertzian hypothesis or an environmental explanation?

C. Pritchard[1], D. Baldwin[2], A. Mayers[3]
[1]School of Health & Social Care, Bournemouth University, Bournemouth, [2]Dept of Psychiatry, University of Bamako, Southampton, [3]School of Design, Engineering & Computing, Bournemouth University, Bournemouth, UK

Aim: To examine and explain increases (1979-2006) in adult (aged 45-74) neurological deaths in 20 Western World Countries (WWC).
Method: WHO mortality data for a 3-year average baseline from 1979-81 are compared with latest index years 2004-06 for 'All-Causes-of-Death'; (ACD), 'Other Neurological Deaths' (OND) and 'Mental Disorder Deaths' (MDD) rates per million (pm) by sex, with a focus upon USA rates, matched against the other WWC, using Chi square tests to determine any differences over time. Combined OND and MDD rates are analysed to control for any diagnostic/recording artefact.
Results: ACD Context: No country had less than a 34% reduction in average (aged 45-74) male ACD, generally declining more than female rates. OND: 10 and 12 countries male and female rates rose substantially (>20%) but two countries' rates fell, with USA having the biggest increases. MDD: 9 male and female WWC rates rose substantially (>20) but two fell, USA had 9th and 6th highest increases. **Combined rates:** Combined male and female rates rose (>10%) in 13 and 15 WWC respectively; two fell, USA male and females increases were 3rd and 1st highest. USA vs. WWC: USA had significantly bigger increases over the period than 13 other WWC.
Conclusions: Explanation of the results can reject a Diagnostic Artefact; whilst there would be some possible Gompertzian effect, ageing exposes to age-related deaths, but the variations between countries and sexes suggest an epigenetic explanation - genetic predispositions meeting multi-environmental triggers. These rises, if continued have serious implications for most WWC neurologist and policy makers.

P2696

Ten-year study of the influence of meteorological factors on intracerebral haemorrhage hospitalizations in Nis (Serbia)

V. Milosevic[1], M. Zivkovic[1], S. Djuric[1], V. Vasic[2], T. Pekmezovic[3]
[1]Clinic of Neurology, Clinical Centre Nis, [2]Faculty of Economics, [3]Institute of Epidemiology, University of Belgrade, Serbia

Introduction: The study of the meteorological factors influence on spontaneous intracerebral haemorrhage (ICH) onset may contribute to a better understanding of the seasonal variability of this disease. The aim of our study was to examine the association of meteorological factors and hospital admissions for ICH in Nis (Serbia).
Methodology: The data source for this study was the Nis hospital-based stroke registry. During the studied period (1997- 2007, 130 months) a total of 1,569 ICH patients were registered (806 male, 763 female; mean age: 63.9±11.4 years). We have also used the following meteorological measurements of the local weather station: maximum (Tmax), minimum (Tmin) and mean (Tmean) air temperature, precipitation (Pr), sunshine (Sn), cloud cover (Cc) and relative humidity (Hm). The monthly number of ICH patients was related to the monthly mean values of meteorological factors.
Results: Results showed a significant negative correlation between the monthly number of ICH patient admissions and monthly mean of Tmax ($r=-0.290$; $p=0.001$), Tmin ($r=-0.303$; $p< 0.001$), Tmean ($r=-0.295$; $p=0.001$) and Cc ($r=0.174$; $p=0.048$). There was no significant correlation between the monthly number of ICH inpatients and monthly mean of Pr, Sn and Hm. The number of ICH inpatients is higher than expected in months in which the average Tmax is 20 degrees Celsius or less (January-April, October-December).
Conclusion: In conclusion, significant seasonal variations in the numbers of ICH admissions and the negative correlation between environmental temperature and the number of ICH admissions speaks in favour of a strong influence of meteorological factors.

P2697

Factors predicting severity and duration of MS relapses: a prospective study

D. Vecchio[1], N. Paola[1], L. Collimedaglia[1], S. Bonissoni[1], M.G. Rosso[2], F. Perla[2], A. Stecco[3], F. Monaco[1], M.A. Leone[1]

[1]Clinica Neurologica, Ospedale Maggiore della Carità, Novara, [2]S.C. di Neurologia, Ospedale "S. Croce e Carle", Cuneo, [3]Istituto Radiologia Diagnostica ed Interventistica, Ospedale Maggiore della Carità, Novara, Italy

Objective: To prospectively evaluate factors predicting severity and duration of early relapses in a cohort of patients with CIS or RR-MS.

Patients and methods: 95 consecutive patients enrolled from January 2001 to December 2003, evaluated every 6 months or at any relapse up to 31 July 2005. Severity was defined for each FS as the difference between the score at maximum worsening and the score before the onset of the relapse. Duration was calculated from the date of onset to the date of maximum improvement of the last symptom. Predicting factors were relapse-related (age at first relapse, number and type of affected FS, speed of onset, infections in the preceding month) and patient-related (gender, season of birth, age and season of first attack, CSF oligoclonal bands, Link Index, CSF IgG value, first brain MRI, time first-second relapse, relapse rate and sequelae).

Results: We counted 248 attacks. Severity was related to duration, number and type of affected FS. In particular the highest risk of a severe attack was for brainstem symptoms (OR 6.4, 95% CI 3.3-12.4), followed by sphincter (6.1, 2.4-15.7), motor (4.0, 2.3-7.1), cerebellar (4.0, 1.8-9.6), and sensitive (2.5, 1.4-4.5). In the multivariate model, number of FS explained severity (34.1, 15.3-75.7) Duration was influenced by severity, number and type of affected FS. In the multivariate model, severity explained duration (2.1; 1.2-3.6).

Conclusions: Factors predicting severity and duration of MS relapses are more closely linked to characteristics of the single relapse than to patient's characteristics.

P2698

Cerebrolysin attenuates proto-onco genes expression, brain pathology and sensory-motor dysfunction following heat stress in normotensive rats

H.S. Sharma[1], S. Zimmermann-Meinzingen[2], A. Sharma[3], D.F. Muresanu[4]

[1]Anesthesiology and Intensive Care Medicine, Uppsala University, Uppsala, Sweden, [2]EVER Neuro Pharma GmbH, Unterach, Austria, [3]Anesthesiology and Intensive Care Medicine, Uppsala University Hospital, Uppsala, Sweden, [4]Neurology, University of Medicine and Pharmacy, Cluj-Napoca, Romania

The proto-ontogenesis such as c-fos and c-jun are overexpressed in the brain following different mechanical, chemical, metabolic or environmental stress induces insults to the CNS. Expression of these proto-oncogenes is normally associated with brain pathology. There are reasons to believe that lack of growth factors or abnormal expression of growth factor receptors following brain insult could be one of the reasons behind overexpression of these proto-oncogenes in the CNS. Thus, it appears that suitable supplement of growth factors in situation of neurotrauma caused by various stressors may result in attenuation of brain pathology and downregulation of these proto-oncogenes. This hypothesis was tested in a rat model of heat stress-induced brain injury and proto-oncogens expression in normotensive animals following treatment with cerenrolysin, a mixture of various neurotrophic factors. Rats subjected to 4 h heat stress at 38°C in a biological oxygen demand incubator (BOD) exhibited profound expression of c-jun and c-fos in different brain regions. These brain regions are often associated with brain oedema and brain pathology showing neuronal, glial and endothelial cell damages. Pre-treatment with Cerebrolysin (5ml or 10ml/kg, i.v., 30min before stress) resulted in a marked downregulation of heat induced c-fos and c-jun overexpression. This treatment also reduced the sensory-motor dysfunction and brain pathology in the heat stressed animals. These observations for the first time suggest that overexpression of proto-oncogenes in heat stress is associated with brain pathology and Cerebrolysin has the capacity to downregulate these proto-oncogenes leading to neuroprotection, not reported earlier.

P2699

A novel exon 3 mutation in a Tunisian patient with Lafora's progressive myoclonus epilepsy

H. Mrabet[1], A. Mrabet[1], A. Malafosse[2]
[1]Neurological Department, Charles Nicolle Hospital, Tunis, Tunisia, [2]Psychiatry Genetics Unit, University of Geneva, Geneva, Switzerland

Lafora disease (LD) is an autosomal recessive disease, frequent in Mediterranean countries, characterized by epilepsy, myoclonus, dementia and periodic acid-Schiff-positive intracellular inclusion bodies. LD is caused by mutations in the EPM2A or EPM2B genes. The EPM2 gene expands 4 exons and more than 30 different mutations have been reported. We report a novel mutation in a Tunisian family with a phenotype of Lafora disease. An 18-year-old patient presented to our neurological department of Charles Nicolle Hospital with a 6-year history of drug-resistant epileptic seizures, progressive myoclonus, ataxia, and cognitive decline. In her family history, her sister died from the same symptoms at age 22. Neurological examination showed impaired cognition, dysarthria and ataxia. Electrophysiological studies, skin biopsy and MRI were in favour of the diagnosis of Lafora disease. Genetic analysis showed a novel homozygous mutation (c.659T>A; Lu69Glut). Parents were heterozygous for this mutation.

P2700

Six patients with hereditary motor and sensory neuropathy type VI

K.G. Choi[1], J.H. Kim[2], S.H. Park[3], O.S. Kweon[4], J.S. Ha[5], H.R. Yang[1], K.D. Park[1], B.O. Choi[1]
[1]Neurology, Ewha Womans University, [2]Neurology, Hanyang University, [3]Neurology, Seoul National University Bundang Hospital, [4]Neurology, Jung Ang University, [5]Neurology, YeongNam University, Seoul, Republic of Korea

Objectives: HMSN VI with optic atrophy is known to be caused by mutations in the MFN2 gene. We investigated to find the phenotypic characteristics of HMSN VI through 6 patients confirmed by clinical and genetic evaluations.
Methods: We screened the MFN2 gene from 256 unrelated CMT patients and identified in 6 patients MFN2 mutation. They were studied by lower leg MRI, nerve conduction studies and in 1 of 6 sural nerve biopsy was performed.
Results: Among 6 HMSN VI patients, 2 of pathogenic mutations were identified. 5 of 6 had R364W mutations, and the other one L92P mutation. The mean onset age of CMT was 4.2±3.3 years, and that of optic atrophy was 33±5.8 years. Muscle weakness and atrophy started and predominated in the distal parts of legs and became wheelchair bound with R364W group or walk with ankle foot orthosis with L92P group. Semi-thin transverse section of the sural nerve showed a marked loss of large myelinated fibres. Lower leg MRI was performed in five patients. Fatty infiltration of leg muscle was more pronounced in all four compartments showed length-dependent axonal degeneration and a tendency to involve soleus muscle. In thigh muscle MRI, anterior compartment was more severely involved than the other compartments.
Conclusion: We found that the onset age of optic atrophy was later than that of CMT neuropathy and R365W is the most common mutation developing HMSN VI. Fatty infiltration of leg muscle was in all 4 compartments, and in thigh muscle, anterior compartment was severely involved.

P2701

Metformin induces fulminant lactic acidosis and fatal hepatorenal syndrome in a patient with diabetes mellitus due to mitochondrial disease

P. Thajeb[1,2,3], T. Thajeb[4], D.-F. Dai[5]
[1]Graduate Division, Biomedical Science, John A Burns School of Medicine, UHM, USA, [2]Medical Department and Council for Medical Education, China Medical University Hospital, [3]Faculty of Medicine, National Yang-Ming University School of Medicine, Taipei City, [4]Nephrology, Landseed Hospital, Taoyuan, Taiwan R.O.C., [5]Pathology, University of Washington Medical School, Seattle, WA, USA

Metformin is a biguanide used widely in patients with type 2 diabetes mellitus (T2DM). The American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD) recommended that metformin use plus lifestyle intervention as the initial therapeutic step for T2DM. The issue that metformin may cause lactic acidosis (LA) remains controversial. The Compendium of Pharmaceuticals and Specialties listed 3 contraindications to the use of metformin: (1) renal impairment with elevated serum creatinine level of >136mmol/L in men, and >124mmol/L in women, or abnormal creatinine clearance; (2) presence of congested heart failure; and (3) advanced age of >80 years. The incidence of metformin-induced lactic acidosis (MILA) is around 6.3 to 8.1 per 100,000 patient-years. Mortality of MILA is high up to 50%. In general, metformin use in T2DM is safe. We herein report a 36-year-old man with DM and mitochondrial (mt) disease who manifested with neuromyopathy, hepatopathy, epilepsy, ischemic stroke, and dementia. Genotyping confirmed an A3243G mutation of the mt DNA. The patient was placed on metformin 500mg twice daily for 4 weeks to control hyperglycemia. He then developed general malaise and frequent runs of focal seizures that subsequently developed to a hepatorenal syndrome and fulminant LA. Immediate discontinuation of metformin, intravenous bicarbonate supplementation and acute haemodialysis did not reverse the profound metabolic acidosis and he died of multiple organ failure in 4 days. We conclude that metformin must be contraindicated in subjects with DM due to mitochondrial disorder to avoid fulminant LA.

P2702

Investigation of sporadic ataxia patients in the Cypriot population

C. Votsi[1], P. Nicolaou[1], A. Georghiou[1], K. Kleopa[1], L.T. Middleton[2], M. Pantzaris[1], S. Papacostas[1], T. Kyriakides[1], K. Christodoulou[1], E. Zamba-Papanicolaou[1]
[1]The Cyprus Institute of Neurology and Genetics, Nicosia, Cyprus, [2]Imperial College, London, UK

Introduction: Spinocerebellar ataxias (SCAs) comprise a large group of slowly progressive neurodegenerative diseases with ataxia as the main symptom. Age of onset ranges from childhood to late adulthood. There exist both sporadic and familial SCA patients. Many genes have been identified for dominant and recessive ataxias and relative frequencies of dominant SCAs have been established in many populations. Although sporadic cases are quite frequent in the majority of populations (40%-60%), their etiology is hardly known. Our study focused on the Cypriot sporadic SCA patients aiming towards the identification of causative mutations. Patients were initially excluded from MSA and acquired causes. We hereby examined these patients for the most common SCA mutations.
Patients and methods: 38 sporadic SCA patients were examined for the known mutations in the FRDA, SCA1-3, SCA6-8, SCA10, SCA12, SCA17 and DRPLA genes using standard molecular genetic methodologies. In addition patients were examined for the novel Cypriot SETX c.5308_5311delGAGA mutation and for any copy number variations of the FXN, SETX and APTX genes by MLPA analysis.
Result: All patients were excluded from any of the above mutations.
Conclusion: Our results demonstrate that genetic factors causing ataxia in Cypriot sporadic SCA patients greatly differ from other populations.

P2703

Hereditary spastic paraplegias in the neurogenetic unit of Coimbra's University Hospital

J. Domingues, C. Januário
Unit, University Hospital, University of Coimbra, Portugal

Background: Hereditary spastic paraplegias (HSP) are a clinically and genetically heterogeneous group of conditions characterised by the presence of lower limb spasticity and weakness. Autosomal dominant HSP is the most prevalent form, with mutations in the SPG4 (spastin) and in the SPG3A (atlastin) genes accounting for the majority of them.
Objective: To perform a clinical and genetic study of families with HSP followed in the Neurogenetic Unit of Coimbra's University Hospital.
Methods: A cross-sectional and retrospective study was performed in the population of patients with HSP followed in the Neurogenetic Unit to collect clinical and genetic data of index cases and their families. Molecular diagnosis was performed by the Institute for Molecular and Cellular Biology (Porto, Portugal).
Results: We identified 20 families, including 23 affected patients, fulfilling the clinical criteria for HSP. Dominant hereditarity was present in 60% of cases. Two spastin and two atlastin mutations were identified, two of them being novel. The phenotype in the majority of patients was pure HSP with a mean age at onset of 28 years. A novel heterozygous missense mutation in exon 12 of the SPG3A gene was detected in a patient with early-onset HSP complicated by mental impairment and thin corpus callosum.
Conclusions: Our patients share similar clinical and genetic manifestations with those described in other populations, with "pure" autosomal dominant HSD being responsible for the majority of cases. Only SPG4 and SPG3A mutations were found. The pathological significance of the new SPG3A mutation is still unknown.

P2704

First case of Val30Met familial amyloid polyneuropathy in a black African

C. Bridel[1], E. Savva[1], M. Magistris[1], M. Morris[2]
[1]*Division of Neurology, Department of Neurosciences, University Hospital of Geneva and Faculty of Medicine,* [2]*Molecular Diagnostic Laboratory, Service of Genetic Medicine, Dept of Genetic and Laboratory Medicine, Faculty of Medicine, University of Geneva, Geneva, Switzerland*

Familial amyloid polyneuropathy (FAP) is an autosomal dominant monogenic disease characterized by accumulation of amyloid fibrils in peripheral nerves and other organs. FAP is associated with mutations in the transthyretin gene (TTR) on chromosome 18. Among the hundred point mutations identified in TTR, a Methionine for Valine substitution at codon 30 (Val30Met; HGVS c.148G>A, p.Val50Met) is by far the most common pathogenic variant. FAP was first described in Portugal, but other important clusters of families are found in Sweden, Japan and South America. Genetic analysis revealed a common haplotype in Portuguese and Brazilian Val30Met patients. In contrast, distinct haplotypes were found in Swedish Val30Met patients, and three different haplotypes have been identified in Japanese Val30Met families, one of which was also found in Portuguese patients. Significant phenotypic variability is observed amongst Val30Met patients with distinct geographic origin, especially regarding penetrance and age of onset. In Portugal, high penetrance and early disease onset are typical. Here, we describe the case of a 42-year-old female black African patient from Congo, presenting with a severe sensorimotor and autonomic polyneuropathy. Family history was positive for at least 4 first degree relatives. Genotyping of TTR revealed the Val30Met substitution. Clinically, the age of onset and expressivity of the disease were similar to Portuguese FAP. This is the first report of a case of Val30Met FAP in a black African patient. Further genetic analysis will determine the haplotype of the mutation and shed light on the origin of the mutation.

P2705

Fabry's disease is a "hydra with many faces"

S. Kopishinskaya[1], A. Gustov[2], V. Antonova[2], N. Polyakova[2], N. Dudorova[2], E. Mironova[2]
[1]Chair of Neurology, [2]Nizhny Novgorod Medical Academy, Nizhny Novgorod, Russia

Aims: Fabry's disease is a generalized accumulation disease. The aim of this study is to reveal all Fabry's disease clinical faces.
Methods/patients: We reviewed 435 full-text articles about Fabry's disease clinics. Also we used our experience of the management of 14 homo- and heterozygous Fabry's patients in Nizhny Novgorod Regional Hospital.
Results: First face: a phacomatosis. Angiokeratoma Fabry is a reddish, violet-shaded skin lesion which does not turn pale, varies in diameter and has typical localization. Second face: neuropathic pain (painful polyneuropathy). Fabry pain syndrome consists of constant acroparesthesia (100 %) in hands and feet like burning, pricking, pain and unpleasant sensations; occasional "Fabry Crises" (77 %) lasting from several seconds to weeks - intensive, painful, exhausting pain irradiating into hands and feet. Frequently Fabry pain cannot be stopped with drugs (the central pain?) and has triggers: fever, physical activities, weariness, stress, weather changes. Third face: the small vessels disease. The clinical pictures of the small vessels disease in Fabry's patients are lacunar infarction, white substance affection, micro-bleedings and big haemorrhages. Forth face: a young stroke. Fabry's stroke is the main cause of death in Fabry's patients, before the age of 40. Fifth face: a vasculitis. Glycolipids accumulating in Fabry's disease are immunogens. Sixth face: a peripheral vegetative insufficiency. Lipids accumulation in neuron groups of vegetative nervous system due to loss of thin myelinated and unmyelinated nerve fibres. Other faces: "double-dyed" atherosclerosis, kidney pathology, ocular lesions.
Conclusions: So Fabry's disease is a "hydra with many faces".

P2706

Syndromic Charcot-Marie-Tooth is easily neglected in ordinary diagnostics of Charcot-Marie-Tooth disease

G.J. Braathen[1,2,3], A.K. Eek[1], H. Høyer[1], D.K. Bergsaker[4,5], M.B. Russell[2,3]
[1]Department of Laboratory Medicine, Genetic section, Telemark Hospital, Skien, [2]Head and Neck Research Group, Research Centre, Akershus University Hospital, Lørenskog, [3]Faculty Division Akershus University Hospital, University of Oslo, [4]Department of Paediatrics, Akershus University Hospital, Lørenskog, [5]Resource Centre for Rare Disorders, Frambu, 1404 Siggerud, Oslo, Norway

Background: Charcot-Marie-Tooth disease (CMT) is a peripheral neuropathy characterized by slow progressive weakness in legs and later in hands. CMT is the most common inherited disorder of the peripheral nervous system. It is a heterogeneous disorder making clinical, neurophysiological and genetic classification a challenge. Several syndromes display CMT characteristics. Up to date 43 genes causing CMT have been identified. Duplication of the peripheral myeling protein 22 (PMP22) is the most common cause to CMT, as it accounts for 20-50% of all the CMT cases. Other copy number variants (CNV) have not yet been assigned to the phenotype.
Methods: A girl with a CMT phenotype and additional clinical features was referred for a neurogenetic consultation. Sequencing of CMT genes was supplemented with Array Comparative Genomic Hybridization (ACGH) analyses.
Results: Mutation analyses for the most common CMT genes were negative. Clinical reconsideration and further analyses revealed the cause of her de novo phenotype, i.e. a deletion on 18q22.3.q23 of 8.5Mb containing 26 genes tested with probes. The ACGH result was: arr 18q22.3q23(67563811-76083117)x1 dn
Conclusions: The involved genes such as CTDP1, GALR1 and MBP explain different aspects of her phenotype.

P2707

Charcot-Marie-Tooth disease (CMT) and novel mutations in Connexin 32 and LITAF

H. Høyer[1], A.K. Eek[1], M.B. Russell[2,3], G.J. Braathen[1,2,3]
[1]Department of Laboratory Medicine, Section of Medical Genetics, Telemark Hospital, Skien, [2]Head and Neck Research Group, Research Centre, Akershus University Hospital, Lørenskog, [3]Faculty Division Akershus University Hospital, University of Oslo, Nordbyhagen, Oslo, Norway

Background: Charcot-Marie-Tooth disease (CMT) is the most common inherited disorder of the peripheral nervous system with an estimated prevalence of 1 in 1,214. CMT is a heterogeneous disorder. Neurophysiology subdivided CMT into type 1 and 2, depending on whether the median motor conduction velocity (MCV) is less or above 38m/s. A third form has intermediate MCV (25-45m/s). Up to date 43 genes causing CMT have been identified. Mutations in Connexin 32 (Cx32) is the second most common cause of CMT. Cx32 encodes a gap junction protein that facilitates transportation of ions and small molecules between cells. Mutations in the transcription factor Lipopolysaccharide-induced TNF factor (LITAF) / Small Integral Protein of Lysosome/Late Endosome (SIMPLE) are relatively rare and constitute less that <1% of identified CMT mutations.
Methods: We analyzed CMT patients referred to Telemark Hospital by sequencing analysis.
Results: We identified two novel mutations, in Connexin 32 the heterozygote mutation c.840C>G (Cys280Trp) and in LITAF the heterozygote mutation c.374T>G (Leu125Arg).

P2708

De-novo silent cerebral autosomal dominant arteriopathy with subcortical infarcts and leucoencephalopathy

J.-H. Kwon
Neurology, Ulsan University Hospital, Ulsan, Republic of Korea

Cerebral autosomal dominant arteriopathy with subcortical infarcts and leucoencephalopathy (CADASIL) is a hereditary small vessel disease that affects brain and leads to disability and dementia. It is due to mutations of the NOTCH3 gene on chromosome 9. Although clinical presentations of CADASIL vary between families, its initial manifestation is usually migraine with aura. White-matter (WM) abnormalities in T2-weighted image usually presents after migraine. We report a patient who was detected incidentally without clinical symptoms including migraine, ischemic stroke, mood disturbances and cognitive declines. A 46-year-old man visited the outpatient clinic complaining of abnormalities in the brain MRI. He got a physical examination and checked brain MRI and MR angiography incidentally concerning for organic brain lesion. He was previously healthy and had no headache, history of stroke, depression or executive dysfunction. Family history revealed no certain abnormality. He had no risk factor of stroke. Fluid-attenuated inversion recovery (FLAIR) images showed diffuse and confluent WM hyperintensities involving anterior part of bilateral temporal lobes, subcortical areas and basal ganglia. Diffusion-weighted and gradient echo images and MR angiography revealed no abnormalities. Gene analysis showed pathologic point mutation in the NOTCH3 gene (c. 1010A>G, p. Tyr337Cys), and as far as we know, it was first case in South Korea. Unfortunately, we could not check genetic analysis of his family due to refusal. In conclusion, clinician should be concerned of the possibility of CADASIL if the brain MRI shows unexplainable WM lesions, even though the patient is clinically asymptomatic.

P2709

FGA Thr312Ala polymorphism is a protective factor for intracerebral haemorrhage (ICH) in Polish but not in Greek population samples

J.M. Jagiella[1], E. Dardiotis[2], M. Wnuk[1], K. Fountas[2], G. Hadjigeorgiou[2], A. Slowik[1]
[1]Department of Neurology, Jagiellonian University Medical College, Krakow, Poland, [2]University Hospital of Larissa, Greece

Objectives: Genetic variants in the haemostasis pathway might affect the likelihood of ICH. Since the FGA Thr312Ala polymorphism of fibrinogen alpha chain gene influences the fibrin clot structure, we aimed to investigate the association between the FGA Thr312Ala polymorphism and the ICH risk in Polish and Greek population samples.
Methods: 261 patients with ICH from the Polish and 242 from the Greek population as well as 550 and 224 controls, respectively, were genotyped for the FGA Thr312Ala polymorphism using TaqMan SNP allelic discrimination.
Results: The distribution of the FGA Thr312Ala polymorphism was different between the Polish cases and controls (cases: AA-167 (64%), AG-88 (34%), GG-6 (2%) vs. controls: AA-326 (59%), AG-189 (34%), GG-35 (6%)). The GG genotype was a protective factor for the ICH risk in recessive (OR=0.34;95%CI:0.14-0.83) and additive (OR=0.77;95%CI:0.60-0.99) models. A logistic regression analysis showed that the studied poly morphism was a protective factor for this disease independent of age, gender, hypertension and smoking in recessive (OR=0.18;95%CI:0.05-0.60) and additive (OR=0.66;95%CI:0.50-0.89) models. The distribution of the studied polymorphism was similar between the Greek cases and controls (cases: AA-142 (59%), AG-89 (37%), GG-11 (5%) vs. controls: AA-145 (65%), AG-67 (30%), GG-12 (5%), p=0.289) and does not affect the ICH risk.
Conclusions: The genotype with GG (312Ala) alleles of the Thr312Ala polymorphism reduces the ICH risk in the Polish population. Further studies in different populations and a subsequent metaanalysis of the collected data may show the role of the FGA Thr312Ala polymorphism as a risk factor of ICH.

P2710

Association between PIK3C2B gene and Parkinson's disease: evidence for involvement of the PI3K/AKT pathway

G. Xiromerisiou, E. Dardiotis, P. Kountra, I. Patramani, C. Vogiatzi, M. Katsavaki, V. Tsimourtou, S. Ralli, K. Markou, A. Papadimitriou, G. Hadjigeorgiou
Department of Neurology, Faculty of Medicine, University of Thessaly, Larisa, Greece

Introduction: Studies examining the role of PI3KC2B -phosphoinositide-3-kinase- suggest involvement of this protein in numerous biological responses that encompass the regulation of cell growth and the modulation of cell survival and death. On the other hand, AKT1 is a phospholipid-binding protein and the downstream effector of the PI3K pathway.
Aim of the study: We have previously conducted a genetic association study between AKT1 gene and Parkinson's disease. Based on these data, the investigation of PI3K could add more evidence that PI3K/AKT signalling pathway is involved in Parkinson's disease.
Materials and methods: We genotyped six tagging single nucleotide polymorphisms (tSNPs)- rs1733437, rs2271421, rs1203185, rs1107339, rs1240264- lying within this gene in a case-control study. We performed the analysis in a Greek cohort of 288 PD cases and 291 controls to assess association between risk of PD and alleles, genotypes and haplotypes.
Results: We discovered a highly significant association with one intronic SNP rs1733437, allelic p=0.003, genotypic p=0.01, and a moderate association with two other intronic SNPs, rs1203185alleleic p=0.01, genotypic p=0.02 and rs1107339allelic p=0.02.
Furthermore we detected a common haplotype, CATGAG (frequency in cases 36%, in controls 24,6%) that is positively and highly associated with risk of PD ,p=0.00018 OR=1.66 with 95% CI=1.27-2.18, whereas a second haplotype, AATAGG was found to be negatively associated with risk of PD, p=0.007, OR=0.42, 95%CI=0.22-0.81.
Conclusion: Our results strongly support PI3K as a risk factor for Parkinson's disease trough many possible mechanisms involving different signalling pathways.

P2711

CADASIL: migraine with aura, stroke like episodes and Reynaud's phenomenon in the clinical picture

A. Bartkova[1], R. Opavsky[1], A. Santava[2], P. Hlustik[1], R. Herzig[1], K. Obereigneru[1], I. Vlachova[1], D. Sanak[1], P. Kanovsky[1]
[1]Dep of Neurology, [2]Dep of Genetics, Palacky University Hospital, Olomouc, Czech Republic

Introduction: Cerebral autosomal dominant arteriopathy with subcortical infarct and leukoencephalopathy (CADASIL) is a hereditary arteriopathy caused by mutation of NOTCH3 gene on chromosome 19. Its clinical features vary, including strokes in the young age, cognitive impairment, and headache, mainly migraine with or without aura. Other manifestations such as psychiatric disturbances, seizures, and hypoacusis or learning disorders have been reported.
Case report: We present clinical and neuroradiological features, skin biopsy and pedigree in three NOTCH 3 positive siblings (2 sisters - 45 and 43 years old and brother 33 years old). Their clinical picture includes migraine with aura and transient ischemic attacks. Magnetic resonance imaging revealed diffuse leukoencephalopathy with involvement of bilateral anterior temporal lobes. Skin biopsy demonstrated granular osmiophilic material deposits in dermal arterioles, diagnostic for CADASIL. Both sisters additionally manifest Reynaud's syndrome with paroxysmal white-blue-red discoloration of the fingers and toes induced by cold or stress. Connective tissue disease was not present in these family members.
Conclusion: We consider the underlying CADASIL arteriopathy as a plausible cause of the observed Reynaud's phenomenon in our patients. Parallel occurrence is less likely because of the Reynaud's phenomenon positive family history. MEDLINE search has not yielded any published association of CADASIL and functional vascular disease.

P2712

Application of telemedicine for neurological patients in remote islands and rural areas

W.-L. Chen[1,2,3], W.-T. Chiu[1,2], S.-H. Tsai[2,4,5]
[1]School of Public Health, [2]Institute of Injury Prevention and Control, Taipei Medical University, [3]International SOS, [4]Department of Emergency Medicine, Taipei Medical University and Shuang Ho Hospital, [5]National Aeromedical Approval Center, Department of Health, Taipei, Taiwan R.O.C.

Background: Demand for emergency air medical transport (EAMT) has increased in recent years in remote islands and rural areas where medical facilities are relatively scarce. With appropriate new telemedicine applications, EAMT has been reduced and patients' clinical outcomes have improved. The objective of this report is to review the role of telemedicine for patients with neurological diseases in remote islands and rural areas.
Method: Retrospective analysis of all air medical transport patients from October 2002 to December 2009 was performed. All materials were collected from the databank of Taiwan National Aeromedical Approval Center (NAAC). The data were analyzed with Microsoft EXCEL and SPSS v. 11.0 software.
Results: A total of 2284 patients were included. Among the 2284 patients, 1976 patients were transported by helicopter or chartered fixed wing aircraft. Neurological disease comprised 30.4% of total transfers. Acute stroke comprised the majority (56.2%) of neurological diseases. 308 of 1976 patients who remained on remote islands or were transported by commercial aircraft were safely consulted with real-time video-telemedicine by specialist in NAAC. There was no in-flight mortality or air crash in all 1976 flights. Patient management protocol was followed according to the interfacility transport guidelines.
Conclusion: Neurological disease, such as stroke, is one of the leading causes of death in many countries. Shortage of manpower and facility in remote islands and rural areas increase the demand of EAMT for neurological emergency diseases. Video consultations from a remote side to a specialist can alleviate unnecessary air medical transport and associated costs.

P2713

Awareness about stroke risk factors and warning signs

Y. Fris, P. Kamchatnov
Russian State Medical University, Moscow, Russia

Background: Poor public knowledge of stroke risk factors and warning signs is the reason of time delays in arrival to the hospital after the onset of stroke and difficulty in providing prophylaxis. We aimed to assess the awareness of stroke among patients in one of Moscow hospitals and their relatives.
Methods: 350 patients and their relatives (51% women; mean age 61.3±8.2years), were interviewed with questionnaire consisting of 45 questions, including 15 open-ended questions. Additional items provided information about respondents' age; educational status; long term therapy and personal experiences with stroke.
Results: Of these 350 interviewed, 7% did not know any sign or symptom of stroke. Unilateral weakness (80%) and dysphasia (19%) were the most frequently noted symptoms; 16.5% of respondents did not know any risk factor of stroke. Stress (50%) and high blood pressure (49%) were named most frequently as risk factors. Factors such as diabetes mellitus and coronary heart disease were named by 5.3% and 4.8%. Level of knowledge about stroke was not influenced by gender, age and educational level. Most of respondents (82%) said that they need detailed information about stroke. A specialized brochure (56%) and direct dialogue with the doctor (17%) were named as most preferable forms of increasing the knowledge of risk factors and stroke symptoms.
Conclusions: Future health education campaigns should provide information regarding the warning signs and risk factors of stroke and highlight the importance of early hospitalization and providing prophylaxis.

P2714

Peculiarity of D-penicillamine treatment at different clinical forms of Wilson's disease

N. Mocanu, S. Groppa
National Center of Reproductive Health and Medical Genetics, Chisinau, Moldova

P2715

Spinocerebellar ataxia type 17: a case presentation

A. Docu Axelerad[1], A. Hancu[1], D. Docu Axelerad[2], D. Zguma[1], M. Damian[2]
[1]Department of Neurology, Emergency Hospital of Constanta County, [2]Faculty of Physical Education and Sport, Ovidius University, Constanta, Romania

P2716

Duchenne muscular dystrophy: correlation between phenotype, mutation type and allelic gene variant of folate cycle

V.C. Florea[1], E. Scvortova[2], V.C. Sacara[2]
[1]USMF 'NIcolae Testemitanu', [2]Human Molecular Genetics Laboratory, National Center of Reproductive Health and Medical Genetics, Chisinau, Moldova

P2717

Association of Alzheimer's disease with apolipoprotein E and interleukin-1 alpha gene polymorphisms

H. Yıldız[1], M.Ö. Erdogan[1], S. Artan[2], M. Solak[1], M. Yaman[3], D. Özbabalik[4], E. Çolak[5]
[1]Medical Biology, Afyon Kocatepe University, Afyonkarahisar, [2]Medical Genetic, Eskişehir Osmangazi University, Eskisehir, [3]Neurology, Afyon Kocatepe University, Afyonkarahisar, [4]Neurology, [5]Biyoistatistic, Eskisehir Osmangazi University, Eskisehir, Turkey

P2718

Interaction of normal and mutant HTT in the phenotype of Cypriot Huntington's disease patients

Y.P. Christou, A. Georgiou, P. Koutsou, K. Christodoulou, M. Pantzaris, E. Zamba-Papanicolaou
The Cyprus Institute of Neurology and Genetics, Nicosia, Cyprus

P2719

Seasonal variation of Bell's palsy in northern region of Thailand

S. Wangtongkum, W. Kusoongnam, S. Sirimaharaj
Neurology, ChiangMai Neurological Hospital, Muang, Thailand

P2720

Parkinson's disease to study addiction?

I. de Chazeron[1], P.-M. Llorca[1], I. Chéreau-Boudet[1], J. Perriot[1], L. Ouchchane[2], F. Durif[3]
[1]Psychiatry B, [2]Biostatistics, [3]Neurology A, CHU Clermont-Ferrand, Clermont-Ferrand, France

P2721

Epidemiological aspects of cranial dystonia and hemifacial spasm in Belarus

E. Veevnik[1], S. Likhachev[2]
[1]Department of Neurology, [2]Neurological Science Department, The Republican Center of Neurology and Neurosurgery, Minsk, Belarus

P2722

Clinical and epidemiological characteristics of multiple sclerosis patients with epileptic seizures

M. Adamczyk-Sowa, K. Kubicka-Baczyk, K. Pierzchala, A. Machowska-Majchrzak, A. Mucha-Mazurkiewicz
Neurology, Medical University of Silesia, Zabrze, Poland

P2723

Effect of weather conditions and pollutants on the incidence of Bell's palsy in Northern Thailand

S. Wangtongkum, W. Kusoongnam, S. Sirimaharaj
Neurology, ChiangMai Neurological Hospital, Muang, Thailand

P2724

Observations on the traditional phytotherapy for mental health activities among the inhabitants of the Lakshmipur district in Bangladesh

M.A.H. Mollik[1,2], A.K.M.F. Haque[3], I.J. Mukti[3], B. Ahmmed[4]
[1]Epidemiology, Biostatistics, Community Nutrition and Noncommunicable Diseases, Peoples Integrated Alliance, [2]Health and Nutrition, Biogene Life Care, [3]Health and Nutrition, Bangladesh Institute of Medical Science, [4]Biomedical Engineering, Al-Helal Specialized Hospital Limited, Dhaka, Bangladesh

Neurotoxicology / occupational neurology

P2725

Ulnar nerve lesion in elbow of occupational origin

E. Ehler[1], M. Nakládalová[2], P. Urban[3]
[1]Neurology, Regional Hospital, Pardubice, [2]Department of Occupational Medicine, University Hospital, Olomouc, [3]Neurology, State Health-Care Institute, Prague, Czech Republic

Introduction: Ulnar nerve lesion in elbow (UNE) is the second most frequent mononeuropathy of occupational origin. The aim of our retrospective study was to discover anamnestical, clinical and occupational parameters in workers with occupational UNE that were acknowledged as an occupational disease.
Methodology: Data for our study are from a 14-year-long period (1996-2009), from the Czech Republic. Monitored parameters in clinical findings were the disturbances of sensitivity, paresis and muscle atrophy. From the occupational medicine point of view we aimed at the type of work-load, place of work and duration of load exposition.
Results: During the 14-year-period UNE was acknowledged as occupational disease in 329 professionals included in our sample set (263 men and 66 women patients). 146 men and 6 women have been working in a risk of vibration, 117 men and 10 women were exposed to the risk of over-load. An average duration of exposition to these physical factors was 17.64 (+-11.36) years in men and 12.95 (+-10.87) years in women. Most frequent professionals were glass-cutters, then tool-makers, miners, cutters, lumberjacks, welders, and others.
Conclusion: Occupational UNE provides a serious problem not only from the point of disease prevention but also of qualified and justified acknowledgement of occupational disease. For the improvement of diagnosis setting - definition of the middle grade of UNE - we decided to set up a new diagnostic standard. This retrospective survey is the first step of development of the standard.
Supported by IGA NS/10324-3.

P2726

Marchiafava-Bignami disease: favourable course after intravenous corticosteroids administration

S. Piñeiro[1], M. Lopez[1], M. Aguado[1], J. Gomez-Alonso[1], A. Amaral-Silva[2], J. Mañas-Uxo[3]
[1]Servicio de Neurología, Hospital Xeral Cíes de Vigo, Spain, [2]Servicio de Neurología, Centro Hospitalar de Lisboa Central, EPE, Lisbon, Portugal, [3]Servicio de Radio-diagnóstico, Hospital Xeral Cíes de Vigo, Spain

Introduction: Marchiava-Bignami disease is a severe and rare disorder. It is pathologically characterized by demyelination and necrosis of the corpus callosum. It is most commonly seen in patients with a history of alcohol consumption. Significant sequelae develop in most survivors. However, in the last few years, cases with good prognosis have been described, some of them after corticosteroid treatment.
Case report: A 47-year-old female with past medical history of chronic alcoholism was admitted to our emergency department because of decreased level of consciousness. Her family described psychotic symptoms and aggressive behaviour in the preceding days. On neurological examination she had global rigidity, bilateral pyramidal signs and no verbal response. CT scan showed diffuse corpus callosum hypodensity confirmed by cerebral MRI. The patient was treated with intravenous methylprednisolone (250mg/6h) and vitamin complex, showing a significant clinical improvement at 7 days: she was able to walk without assistance and she had a fluent and adequate speech.
Conclusions: Our case report supports the idea that corticosteroid treatment may contribute to a favourable clinical outcome in Marchiafava-Bignami disease. Whether this effect could be due to its anti-inflammatory properties or other mechanisms remains unknown.

P2727

Is there a relationship among Mini Mental Status Examination Scores, blood carboxyhemoglobin level, and poisoning severity in carbon monoxide poisoning?

S. Genc[1], D. Aygun[2]
[1]*Ministry of Health, Isparta State Hospital, Isparta,*
[2]*Ondokuz Mayis University, Samsun, Turkey*

Objective: Carbon monoxide poisoning (CMP) is a common cause of hypoxia. Acute hypoxia results in hypoxic encephalopathy, including transient alterations of cognitive functions. Mini-Mental Status Examination Scores (MMSES) is useful for evaluating the clinical severity of hypoxic encephalopathy. It has been reported that the clinical effects of CMP are related with the carboxyhemoglobin (COHb) levels. Our aim in this study is to investigate presence of relationship among COHb levels, poisoning severity, and MMSES in the patients with CMP.
Material and method: In our study, the patients who took the diagnosis of acute CMP within one year at the Emergency Department (ED) were evaluated prospectively. Blood samples were taken for COHb measurement and at the same time MMSE was applied to the patients. According to the severity of poisoning patients were subdivided into three groups as mild, moderate and serious.
Results: 51 patients were included in our study. Mean age was 38.4±16.5. According to the severity of poisoning, of the patients, 20 (39.2%) had mild level, 26 (51%) had moderate and 5 (9.8%) had serious poisoning. Mean blood COHb level was 20.2±12.4 (from 0.9 to 48.2) and mean MMSES was 25.8±4.7 (from 12 to 30). While the relationship between severity of poisoning and blood COHb level was not significant, there was a significant relationship statistically between both MMSES and COHb levels and MMSES and poisoning severity.
Conclusion: MMSES of patients admitted to the ED with CMP may be useful for estimating their blood COHb levels and determine the severity of poisoning.

P2728

The study of cross talk between ERK and p38 kinases pathways following BDNF stimulation of cerebellar granule neurons in glucose deprivation

N. Vakili Zahir, M. Abkhezr, Z. Khaje Piri,
A. Kebriaezadeh, S.N. Ostad, M.H. Ghahremani
Tehran University of Medical Sciences, Tehran, Iran

Aims: The mitogen-activated protein kinase (MAPK) cascades are important in mediating cell proliferation, migration, differentiation and death. In neurons, growth factors like BDNF and NGF activate ERK 1/2 pathway to regulate survival and proliferation. Similarly, MAPKs such as p38 kinase are involved in stress induced neuronal death. In this study we have evaluated the ERK1/2 and p38 pathways in neuronal death induced by glucose deprivation model in rat cerebellar granule neurons (CGN).
Methods: Primary cultures of CGNs from the 2-7 neonatal rats were cultured and pathways activation was assessed in cell lysate using Western blotting method and specific phospho antibodies.
Results: An increase in p38 kinase activity and decrease in ERK1/2 phosphorylation was observed after 30 minute glucose deprivation. Block of p38 pathway with SB203580 significantly diminished death in glucose-deprived cells. In the present of BDNF, neurons have low p38 kinase activity and use of PD98059, a specific MEK kinase inhibitor, significantly decreased survival in CGNs. Furthermore, BDNF inhibits death induced by glucose deprivation via ERK1/2 pathway.
Conclusions: The data provide evidence for an essential role of p38 kinase in mediating cell death in CGN and the inhibition of p38 kinase mimics the suppression of death. In contrast, ERK has survival effect in the CGNs and this effect was promoted by BDNF.

P2729

Perfusion computed tomography in the diagnosis of toxic encephalopathy

A.Z. Agbash[1], O.L. Lakhman[2]
[1]Angarsk City Emergency Hospital, [2]Institute of Occupational Health and Human Ecology, Siberian Branch of the Russian Academy of Medical Sciences, Angarsk, Russia

Chronic mercury intoxication (CMI) is known to be one of the leading courses of neurointoxicosis. The pathogenesis of CMI has not been well studied yet and its diagnostic methods are imperfect. This study aimed to investigate the significance of the cerebral atrophy, the alterations in the perfusion parameters in the patients with CMI. 17 males (aged 53-59 years) with the diagnosis of the CMI of stages II and III were included into the study. Clinical manifestation of the disease was progressive cognitive disorder as sign of toxic encephalopathy. Non-contrast CT examination has shown the signs of cerebral atrophy in all the patients. Chronic cerebrovascular disease and stenotic injuries of the intracranial arteries were excluded in all the patients by CT scan performed after IV contrast media injection. Significantly decreased average cerebral blood flow rate and cerebral blood volume, prolongation of the time to peak in the periventricular white matter ($p<0.05$) has been revealed by performing the perfusion computed tomography. The results of the study indicate that the radiologic manifestation of toxic encephalopathy in the patients with CMI is brain atrophic changes and hemodynamic disorders of the brain tissue.

P2730

Opsoclonus-myoclonus syndrome in patients with thallium intoxication

D. Labunskiy[1], V. Poleshchuk[2]
[1]Biomedical Engineering, University of Northern California, Santa Rosa, CA, USA, [2]Research Center of Neurology, Moscow, Russia

P2731

Cerebellar toxicity induced by metronidazole

C.T. Zampas, A.G. Zografaki, P.P. Koutsodimou, T.D. Maris
Venizeleion General Hospital, Heraklion, Greece

P2732

High altitude cerebral oedema: a case report

T.D. Gosavi, P. Ratnagopal
Neurology, National Neuroscience Institute, Singapore General Hospital, Singapore, Singapore

P2733

Abstract cancelled

P2734

Investigating mechanisms of lidocaine toxicity in bovine nucleus pulposus cells

C.H. Loo[1,2,3], H.E. Smith[1,2,3], B.K. Weiner[1,2,3]
[1]Spine Advanced Technology Laboratory, The Methodist Hospital Research Institute, [2]Department of Orthopedic Surgery, The Methodist Hospital, Houston, TX, [3]Weill Cornell Medical College, New York, NY, USA

P2735

Curcumin inhibits aluminium-induced mitochondrial dysfunction and apoptosis in rat brain

P.K. Sood, B. Nehru
Biophysics, Panjab University, Chandigarh, India

P2736

Cognitive dysfunction secondary to professional intoxication with organic solvent

M. Kchaou Landoulsi[1], H. Mrabet Khiari[1], A. Benzarti[2], N. Oudia[1], A. Cherif[1], N. Anane[1], A. Mrabet[1]
[1]Neurological Department, Charles Nicolle Hospital, [2]Preventive Medicine, La Rabta Hospital, Tunis, Tunisia

P2737

Occupational exposure to manganese and neurological sequelae: a case report

M. Maltezou, K. Drakatos, I. Chatzidakis, G. Cheilakos, K. Politou
Neurology, 1st Social Security Institution (IKA) Hospital, Athens, Greece

Sleep disorders

P2738

Obstructive sleep apnoea syndrome (OSAS) in women and men: gender related differences

R. Condurso, I. Arico', G. Serra, G. Mento, R. Silvestri
Neuroscience, Sleep Medicine Center, University of Messina, Italy

Objectives: The aim of this study was to assess gender related differences in the clinical and instrumental presentation of OSAS.
Methods: 141 consecutive OSAS patients were evaluated as far as anthropometric measures, daytime and nocturnal symptoms, psychometric scales (Epworth Sleepiness Scale-ESS, SF-36v2, Beck Depression Inventory-BDI, Hamilton Anxiety Scale-HAMA, Pittsburgh Quality Index-PQI), co-morbidities, ambulatory cardio-respiratory monitoring.
Results: 46/141 patients were females (mean age 56.2), 96 males (mean age 55). Females had a significantly higher BMI (mean 33.85) than males (mean 31,6, $p<0.05$), whereas neck circumference was larger in males ($p<0.0001$). A positive familial history of snoring was higher in females (58%, $p>0.2$), with a 9.3 years for females and 15.2 for males ($p<0.002$). Most frequent symptoms in women were headache and asthenia upon awakening whereas a significant difference was seen as for attention and memory deficits. Both genders reported EDS but an ESS score ≥10 was seen more frequently in females. Apnoea/hypopnoea Index instead was higher in males (mean AHI 34.5, $p<0.01$). Hypothyroidism was overrepresented in females ($p<0.005$). On SF-36v2 women showed a worse quality of life both as PCS ($p<0.001$) as MCS ($p>0.05$), worse sleep quality on PQI ($p<0.05$), moderate mood disturbance on BDI ($p<0.05$), moderate anxiety on HAMA ($p<0.02$) than men.
Conclusions: Unexpectedly OSAS males had a lower BMI compared to females. Females had more hypothyroidism but a similar rate of hypertension, dislipidemia and GERD. Finally, women had a worse quality of life and sleep with depression and anxiety than men.

P2739

The consequences of snoring, obstructive sleep apnoea and obesity hypoventilation syndrome on mortality, social outcome, economy and effect of CPAP treatment. A controlled national study

J. Kjellberg[1], P. Jennum[2]
[1]*Danish Institute for Health Services Research, Copenhagen,* [2]*Danish Center for Sleep Medicine, Faculty of Health Sciences, University of Copenhagen, Glostrup, Denmark*

Background: Sleep related breathing disorders (SBD) cause socioeconomical burden.
Aim: To evaluate the factual socio-econonomical consequences of SDB and effect of treatment.
Methods: All Danish patients were extracted from the Danish National Patient Registry (1997-2006), with a diagnosis of snoring (N=12092), obstructive sleep apnoea (OSA, N=19438), and obesity hypoventilation syndrome (OHS, N=755) were identified and compared to four age-, gender and social matched controls randomly chosen from the Danish Civil Registration System Statistics. The annual direct and indirect health costs, frequencies and costs of hospitalization and outpatient use, primary health sector, medication, labour supply, employment, income data and social transfer payments were obtained from the following data sources: The Danish Ministry of Health, the Danish Medicines Agency, The National Health Security, and Coherent Social Statistics.
Results: Patients with snoring, OSA and OHS presented progressive significant higher rates of health-related contacts, al-cause morbidity and mortality, medication use, health-related expenses, unemployment and lower incomes rates than controls. These effects were observed up to 8 years prior to the diagnoses, and further worsened after the diagnose was established. Surgical treatment showed no effect in mortality but increased health usage and costs. CPAP treatment reduced mortality in OSA but in OHS patients, but there were no reduction in costs within the first two years of treatment.
Conclusions: SDB causes significant health related burden. Surgery presents no health related benefits. CPAP reduced mortality in OSA pts, but limited effect on costs, which may be due to late diagnosis. Earlier disease identification would potentially improve prognosis.

P2740

Sleep episodes and excessive daytime sleepiness in patients with Parkinson's disease: a Japanese multicenter study - Keio PD database

Y. Nihei[1], N. Suzuki[1], K. Takahashi[1], M. Seki[1], K. Ohta[2], J. Gotoh[3], K. Yamaguchi[4], Keio PD Database
[1]Department of Neurology, Keio University School of Medicine, [2]Department of Neurology, Tachikawa Hospital, [3]Department of Neurology, Tokyo Saiseikai Central Hospital, Tokyo, [4]Department of Neurology, Japanese Red Cross Mito Hospital, Mito, Japan

Objective: To investigate the prevalence and contributing factors of excessive daytime sleepiness (EDS) and sleep episodes (SE) in Japanese patients with Parkinson's disease (PD).
Methods: At each of 13 participating hospitals, we collected clinical information on individuals with PD and interviewed these patients using the modified Epworth Sleepiness Scale (ESS).
Results: The total number of participating patients was 528. The average age and disease duration 70.9±7.9 years and 5.9±4.5 years, respectively (mean ± SD). The mean levodopa equivalent daily dose (LEDD) was 364±215mg. The average ESS score (8 items) was 5.9±4.7. 85 patients (16.1%) had EDS defined as ESS ≥8, and 59 patients (11.2%) presented with SE. Logistic regression analysis demonstrated that the occurrence of SE was significantly correlated with disease duration, the number of dopamine agonists (DAs) and ESS score. Among the 59 patients with SE, 20 patients did not have EDS. Whereas 13.8% of the patients treated with levodopa and a single DA had SE, the patients treated with levodopa and multiple DAs had a significantly higher rate of SE (27.8%, $p<0.05$).
Conclusions: Sleepiness in patients with PD was related to LEDD and disease duration itself. Although the occurrence of SE was correlated with the ESS score, SE without EDS was observed in some patients. Furthermore, combination therapy with levodopa and multiple DAs increased the risk of SE.

P2741

Sleep difficulties in Georgian children with cerebral palsy: preliminary report. Ongoing clinical trial

T. Ediberidze[1], L. Maisuradze[2], S. Kasradze[1]
[1]Practical-Research Centre for Control and Prevention of Epilepsy, [2]I.Beritashvili Institute of Physiology, Tbilisi, Georgia

Introduction: The present study was aimed to investigate the prevalence of sleep disorders among the Georgian children having Cerebral Palsy (CP) that has not been reported before.
Methods: 414 1-6-year-old children have been investigated within the governmental program "Child Care: early identification and prevention of developmental disorders in children". A structured sleep-wake questionnaire was specially developed on the basis of child sleep Questionnaire for parents. Complete information was obtained for 330 typically developing children (TD) (158 boys, 172 girls) and 84 children having CP (53 boys, 13 girls). The children's sleep has been assessed following the analysis of the responses to a questionnaire on the sleep disorder breathing (SDB), sleep onset difficulty (SOD), frequent nocturnal awakenings (FNA) and disorders of arousal (sleepwalking, sleep terrors, nightmares).
Results: 47.6% of CP children and 24.3% of TD children had sleep problems (SP). FNA (10.3%) and SOD (9.1%) were the commonest reported SP in TD children that was more prevalent among the CP children (17.9% and 17.9% correspondingly). Compared with TD children SDB was the most SP in CP-group (5% vs. 19%). 5.9% of CP children had nightmares while sleepwalking was characteristic for 2.4%. These SP were noted in TD group too: 2.1% and 3.3% accordingly.
Conclusion: The findings of this study signify that SP are common in Georgian children aged 1-6 years. SP were more prevalent among CP children. More research and medical attention is required to clarify sleep disorders in Georgian children, in general, and children with different neurological diseases, in particular.

P2742

Temporal changes in neurobehavioral performance, hippocampal anatomy, and hippocampal expression of NMDA receptor 1 and CaMK II in a mouse chronic intermittent hypoxia model

R.Chen[1], J.-X. Li[2], Z.-H. Li[1], J.-F. Liu[1], C.-F. Liu[1,3]
[1]Sleeping Center, Seond Affiliated Hospital of Soochow University, [2]School of Radiation Medicine and Public Health, Medical College of Soochow University, [3]Department of Neurology, Second Affiliated Hospital of Soochow Univerity, Suzhou, China

Background and aims: To evaluate the underlying mechanisms of the learning and memory impairments associated with obstructive sleep apnoea syndrome.
Methods: Male ICR mice (n=60) were randomly assigned to normoxic control (UC) and chronic intermittent hypoxia group (CIH); each group was divided into day 3, week 1,2,4 and 6. After week 6, animals were kept under normoxic condition for additional 4 weeks. Neurobehavioral assessments (Morris water maze) were performed at day 3, weeks 1, 2 and 6, neuroanatomy of hippocampal CAl region was assessed by electron microscope, and caspase-3 expression was evaluate by immunofluorescence. Hippocampal expression levels of NR1 & CaMK II mRNA and proteins were detected by RT-PCR and Western blotting, respectively.
Results: The CIH mice displayed longer mean escape latency starting as early as day 3, and followed by statistically significant progressive prolongation after CIH. Neuronal apoptosis was observed in the hippocampal CA1 neurons at week 6, with significantly higher expression levels of caspase-3 ($p<0.01$). NR1/CaMKII proteins decreased significantly in CIH at week 2 and 4 ($p<0.01$), the similar time-dependent reductions in mRNA expression ($p>0.05$).The decrease in NR1 & CaMK II mRNA and protein expressions persisted after 4 weeks normoxic recovery ($p<0.05$ or $p<0.01$).
Conclusions: CIH induced neuronal apoptosis of hippocampal, downregulation expressions of NR1 and CaMK II mRNA and proteins of which the similar temporal changes to neurobehavioral impairment was observed.

P2743

Poor academic performance among university students with obstructive sleep apnoea and snoring

B. Khassawneh[1], Y. Khader[2], Y. Tokuda[3], L. Alkhatib[1]
[1]Internal Medicine, [2]Department of Public Health and Community and Family Medicine, Jordan University of Science and Technology, Irbid, Jordan, [3]Mito Medical Center, University of Tsukuba, Ibaraki, Japan

Introduction: Obstructive Sleep Apnoea (OSA) and habitual snoring are known to be associated with impaired attention and poor academic performance among school children. The effect of OSA and snoring on academic performance of university students is not well studied.
Aim: To estimate the prevalence of snoring, daytime sleepiness and OSA among university students and to describe the effect of OSA and snoring on academic performance among university students.
Methods: A cross-sectional survey of university students at Jordan University of Science and Technology was conducted between March and May 2009. The Berlin Questionnaire was used for identifying students with OSA. Academic performance was self reported and below average score considered as poor.
Results: A total of 777 students (49% male; mean age, 20 years) completed the study questionnaire. By the study definition, the overall prevalence of OSA was 5.4%. Snoring was present in 11% and daytime sleepiness was found in 30%. OSA was present in 26 (6.5%) of male students and in 6 (1.6%) of female students ($p=0.001$). Students with OSA were more likely to have poor academic performance (26.2%) than students without OSA (12.7%), OR 2.45 (95% CI 1.2-5.0), ($p=0.015$). Likewise the presence of snoring was associated with poor academic performance, OR 2.96 (95% CI 1.7-5.0), ($p<0.005$).
Conclusions: OSA is an under-recognized health problem among young, male university students. OSA and snoring were associated with poor academic performance. Health care professionals should pay greater attention to this potentially disabling condition.

P2744

REM sleep behaviour disorder (RBD): quality of life issues for patients and their partners

A. Bonakis[1], T. Kontaxis[1], E. Vagiakis[2], C. Routsis[1], N. Kalfakis[1], S.G. Papageorgiou[1]
[1]Cognitive Neurology-Extrapyramidal Disorders Unit, University of Athens, [2]Critical Care and Pulmonary Services, Centre of Sleep Disorders, Evangelismos Hospital, University of Athens, Greece

Introduction: RBD is a parasomnia encountered in degenerative dementing diseases. It is characterized by aggressive behaviour related to the dream content and categorized as idiopathic or secondary (due to neurodegeneration, toxic-drug related).
Aim: To delineate:
- the qualitative characteristics of RBD encountered in the context of dementing diseases
- the impact of RBD on the quality of life of the patient-partner.

Method: From 2008-2010, 230 patients were hospitalized for dementia-extrapyramidal disorders. 32 (10 Parkinson's disease, 9 MSA, 6 DLB, 3 Idiopathic RBD, 3 drug related, 1 narcolepsy-cataplexy) found to suffer from definite RBD (confirmed with video-polysomnography).
In this cohort, the following parameters were investigated: dream content related to the behaviour, quality-severity of motor behaviour, impact of RBD in couple's life, patient's attitude towards RBD.
Results:
Dream content: 87.5% attacked by people, 78% attacked by animals, 69% reported dead relatives, 6% participation in sport activities and 13% giving a lecture. Motor Behaviours: 78% self-protective complex violent behaviour, 3% kicking while playing football, 3% crying or laughing, 15.5% violent jerks. Impact of RBD in couple's life: 16% attempted to struggle their partner, 25% severe injuries. 47% great distress to the partner, 19% great distress to the patient. 84% of the couples started to sleep in separate beds. Patients' attitude towards RBD: 25% consulted a physician, 75% considered the disorder as normal or drug related
Conclusions: Although generally overlooked, RBD is rather frequently encountered among patients with degenerative dementing diseases and represents a potentially harmful condition having a significant impact on the couple's life.

P2745

Relation of polysomnographic variables to sympathetic activity in obstructive sleep apnoea syndrome

S. Khachatryan[1], S. Iritsyan[1], Z. Tavadyan[1], P. Zelveian[2]
[1]Center for Neurology and Sleep Medicine, [2]Preventive Cardiology Center, Yerevan, Armenia

Objective: To study the relation of polysomnography (PSG) variables to sympathetic activity in patients with obstructive sleep apnoea syndrome (OSAS)
Methods: OSAS diagnosis was based on PSG and accepted standards (ICSD-2). The following PSG variables were used: body-mass index (BMI), apnoea-hypopnoea index (AHI), oxygen desaturation index (ODI), arousal index (AI), total heart rate mean (THR), maximum (THRmax) and minimum (THRmin) and for sleep stages REM (REMHR, REMHRmax, REMHRmin) and NREM (NREMHR, NREMHRmax, NREMHRmin), sleep stage transitions (SST). Low frequency to high frequency (LF/HF) ratio was derived from heart rate variability analysis. Spearman's test was used.
Results: Sample: OSAS patients (n=30) aged 30-77 (mean – 47.4, F=3.33%). PSG: AHI-52.7/h, REMAHI – 52.1/h, NREMAHI – 51.6/h; ODI – 54.7/h, SpO2<90%time-129.9min; THR-70.5, REMHR-70.4, NREMHR – 70.6, LF/HF – 8.2 (1.5-31.4); AI – 37.6/h, REMAI – 19/h. Correlations ($p<0.05$): positive – AHI to THR (r=0.457), THRmax (r=0.486); NREMAHI to NREMHR (r=0.480), NREMHRmax (r=0.496); THR to ODI (r=0.478); LF/HF to BMI (r=0.595), AHI (r=0.448), NREMAHI (r=0.427), REMAHI (r=0.497), ODI (0.567), SpO2<90%time (r=0.633); invert - REM duration (%) to REMHR (r=-0.554), REMHRmax (r=-0.541), REMHRmin (r=-0.494); REMAI to REMHR (r=-0.418), REMHRmin (r=-0.476). No correlations: REMAHI to REMHR, REMHRmax, REMHRmin; AHI to THRmin; NREMAHI to NREMHRmin; LF/HF to heart rate and arousal values; SST to all variables.
Conclusions: OSAS severity in REM stage is not associated with sympathetic over-activity, while REM duration inversely correlates to it. Autonomic balance is shifted towards sympathetic over-activity in OSAS patients, what could be explained by overall disease severity but is not associated with heart rate or arousal variables.

P2746

The impact of some antidepressants on sleep quality in patients with depression

R. Ciobotariu[1], M. Padurariu[1], A. Cantemir[1], A. Ciobica[2], C. Stefanescu[1]
[1]Gr. T. Popa University, Socola Hospital, [2]Alexandru Ioan Cuza University, Iasi, Romania

Objective: Insomnia and depression are closely linked together clinically by their epidemiological context, symptomatology and therapeutical implications. In the present study, we compared the impact of several combinations of antidepressants on sleep quality. Our main objective was to optimize and individualize the treatment in depressive patients.
Methods: The study was based on retrospective data regarding depressive patients with sleep disorders. Information was collected from 375 patients and was based mainly on interview. The patients were divided into two groups: those treated with Selective Serotonin Reuptake Inhibitors (SSRIs) in association with Benzodiazepins (BZD) and patients treated with hypnoinductive antidepressants, such as: Mirtazapine, Trazodone, Doxepine.
Results: The treatment with hypnoinductive antidepressants was associated with a progressive decrease of awakenings within first 7 days of use, in 90.93% of patients. Also, a superior compliance was observed in patients treated hypnoinductive antidepressants. The most efficient drug administrated from this category was Trazodone. We also observed a higher rate of hypotension in hypnoinductive antidepressants treated patients, especially when using Doxepine.
When using the SSRIs + BZD, a slower improvement of sleep quality and a higher disturbance of the daily activity, speed reaction and attention were observed. Also, a decreased rate of compliance comparing with the hypnoinductive antidepressants was noted.
Also, the female and the geriatric patients (above 60 years) responded better in both groups and needed lower doses of treatment.
Conclusions: This could be useful for future investigations and clinical applications of antidepressants drugs.

P2747

Some important implications of oxidative stress in patients with depression and insomnia

R. Ciobotariu[1], M. Padurariu[1], A. Ciobica[2], B. Stoica[1], C. Stefanescu[1]
[1]Gr. T. Popa University, Socola Hospital, [2]Alexandru Ioan Cuza University, Iasi, Romania

Introduction: It is considered that sleep deprivation represents an oxidative challenge for the brain and that sleep could have a protective effect against oxidative distress. In this context, our current objective is to determine the oxidative stress parameters in patients with depressive disorder and in depressed patients with insomnia, compared with a normal aged matched control group.
Methods: The psychiatric examination for depression was based on structured interview and Diagnostic and Statistical Manual of Mental Disorder, Fourth Edition criteria. We assessed the levels of some enzymatic antioxidant defences like superoxide dismutase (SOD) and glutathione peroxidase (GPX), as well as markers of cellular oxidative damage, like MDA (malondialdehyde), from the patient's peripheral blood, using chemiluminometric and spectrophotometric methods. The results were compared to an aged-matched control group.
Results: We observed a decrease in the specific activity of both antioxidant enzymes (SOD and GPX) in depressed patients, compared to the control group. Moreover, in patients with depression + insomnia we observed an additional decrease in the specific activity of these two enzymes, compared with the depressed only group. Also, the concentration of serum MDA was increased in patients with depression only and also in those with depression + insomnia. Moreover, we found that in the group with combined depression and insomnia the level of MDA was increased, compared with the subjects with depression only.
Conclusions: Our results could raise some important issues for therapeutics in depression and insomnia disturbances, suggesting that one possible therapeutic solution is to use antioxidants.

P2748

Excessive daytime sleepiness in patients with restless legs syndrome

D.P. Tzonova, O. Larosa, Y. de la Llave, E. Calvo, D. García Borreguero
Instituto de Investigaciones del Sueño, Madrid, Spains

Introduction: Sleep onset and sleep maintenance insomnia belong, together with Periodic Leg Movement during Sleep (PLMS), to the most frequent symptoms in Restless Legs Syndrome (RLS). Despite the reduced sleep time observed in these patients, excessive daytime sleepiness (EDS) is not a common complaint, as just one third of the patients report its presence.
Materials and methods: 31 consecutive patients diagnosed with primary or secondary RLS underwent a clinical evaluation by a sleep expert. Procedures included a Suggested Immobilization Test (SIT) followed by polysomnography. Those with a score higher than 10 on the Epworth Sleepiness scale, were also evaluated by Multiple Sleep Latency Test (MSLT).
Results: Two groups were defined depending on the Epworth scale score: Group A (Epworth >10 in 8 patients) and group B (Epworth <10 in 23 patients). No significant differences were found between both groups on sleep architecture or any other polysomnographic variables (t-test, Mann-Whitney Test). Furthermore, for the group complaining of daytime sleepiness, the mean sleep latency on the MSLT was within the normal range (mean: 17min; SD: 6.6). The mean values of the sleep latency, total sleep time and sleep efficiency were as follows for group A: 27min (SD 32.9), 289min (SD 46.3), 65.5% (SD 16.1) and for group B: 31min (SD 31.5), 215min (SD 109), 56.7% (SD 25.8).
Conclusion: Despite the significantly reduced total sleep time, objective daytime sleepiness is a rare phenomenon in RLS. We suggest that elevated hypocretin levels in the CNS might contribute to an increased hyperalertness during the day.

P2749

Difference of impaired glucose tolerance in positional and non-positional obstructive sleep apnoea syndrome

W.C. Shin[1], Y.W. Cho[2], S.J. Byun[3]
[1]Neurology, Kyung Hee University East-West Neo Medical Center, Seoul, [2]Neurology, Dongsan Medical Center, Keimyung University, Daegu, [3]Neurology, Icheon Medical Center, Icheon, Republic of Korea

Introduction: It is well known that obstructive sleep apnoea-hypopnea syndrome (OSAHS) is associated with impaired glucose intolerance. We investigated that pattern of impaired glucose intolerance differs among patient with non-positional OSAHS and positional OSAHS.
Methods: We diagnosed OSAHS by overnight polysomnography study. And we assessed severity apnoea-hypopnea index (AHI) and positional apnoea-hypopnea index difference. We defined positional OSAHS when supine-lateral index [(supine AHI- lateral AHI)/supine AHI] is more than 0.5. Insulin resistance was assessed with fasting plasma blood glucose, plasma insulin and homeostatic model assessment of insulin resistance index (HOMA-IR), leptin.
Results: The respiratory disturbance index and lowest oxygen desaturation were higher in non-positional OSAHS group than in the positional OSAHS group. It was noted that impaired glucose tolerance and HOMA-IR were more increased in patients with severe OSAHS than in the control group and mild OSAHS. Compared with positional and non-positional OSAHS patients, impaired glucose tolerance and HOMA-IR were significantly increased in the non-positional OSAHS group.
Conclusion: Our result suggests that severe OSAHS is associated with glucose intolerance and non-positional OSAHS has a poor control of glucose than in the positional OSAHS group.

P2750

Intravenous immunoglobulin treatment and screening for hypocretin neuron specific autoantibodies in recent onset childhood narcolepsy with cataplexy

S. Knudsen[1], J.D. Mikkelsen[2], B. Bang[3], S. Gammeltoft[4], P. Jennum[1]

[1]Danish Center for Sleep Medicine, Department of Clinical Neurophysiology, University of Copenhagen, Glostrup Hospital, Glostrup, [2]Neurobiology Research Unit, University Hospital, Rigshospitalet, Copenhagen, [3]Department of Pediatrics, [4]Department of Clinical Biochemistry, University of Copenhagen, Glostrup Hospital, Glostrup, Denmark

Objectives: Narcolepsy with cataplexy (NC) is caused by a substantial loss of hypocretin neurons. Most NC patients carry the same HLA-type (HLA-DQB1*0602) which suggest that hypocretin neuron loss is due to an autoimmune attack. We tested intravenous immunoglobulin (IVIG) as a treatment option in early onset NC.

Methods: Two NC children received IVIG 1g/kg/day in 2 days/month repeated 5 times 3 and 6 months from disease onset, respectively. CSF and serum was analysed for autoantibodies that bind to rat hypocretin neurons.

Outcomes of all published IVIG treated NC cases were standardized and the association between disease duration and IVIG effect was calculated.

Results: CSF and serum autoantibodies were not detectable. Cataplexy improved in both children but only temporarily in one patient. Subjective sleepiness was temporarily improved in one child. Sleep paralysis emerged and hypnagogic hallucinations and REM sleep behaviour disorder worsened in one patient. Sleep parameters remained abnormal and CSF hypocretin-1 levels remained very low.

On a group level, IVIG treatment ≤9 months from disease duration predicted reduction of cataplexy (p=0.004) and sleepiness (NS, p=0.066). Sleep parameters and CSF hypocretin-1 levels were unchanged except in one extremely early IVIG treated case.

Conclusion: The study supports that IVIG treatment initiated before 9 months disease duration has some clinical efficiency. Given the methodological limitations, the unaffected CSF hypocretin-1 levels and lack of autoantibodies suggest that some autoimmune process occurs very early in NC. The final IVIG effect in NC needs to be further investigated in a multicenter placebo-controlled study.

P2751

Excessive daytime sleepiness among patients with moderate stage of Parkinson's disease with- and without subjective sleep complaints

M. Boczarska-Jedynak, B. Jasińska-Myga, G. Opala

[1]Department of Neurology, Silesian Medical University, Katowice, Poland

Background: Sleep disturbances may affect 60%-98% of PD patients. The prevalence of Excessive Daytime Sleepiness (EDS) in PD population varies from 7.7% to 45%.

Aim of study: To evaluate the frequency of EDS in patients with moderate stage of PD, with and without subjective sleep complaints.

Material and methods: 102 patients aged >40, with moderate stage of idiopathic PD of Movement Disorders Outpatient Clinic in Katowice, Poland were included in the study. Subjective sleep disturbances were estimated based on a positive (Group I) or negative (Group II) answer to the question: "Do you have sleep problems?". Group I consisted of 51 consecutive patients (mean age 61.6 years). Group II (control group) included 51 consecutive patients (mean age 66.3 years). Both groups were evaluated based on the Epworth Sleepiness Scale (ESS). EDS was recognized in patients with ESS results ≥10 points, and severe EDS in patients with ESS results ≥15 points.

Results: Patients with subjective sleep complaints achieved higher results in ESS (9.0 vs. 7.2 points, p=0.06). EDS was recognized among 56.9% patients in Group I and 33.3% patients in Group II. Moderate EDS was recognized among 49.0% and 25.5% patients in group I and II respectively and Severe EDS with high risk of sleep attacks - among 7.8% patients in both groups.

Conclusions: EDS is a real problem in PD but one third of patients does not treat it as a sleep disturbance so it could be overlooked in our routine clinical practice.

P2752

Narcolepsy in neurosarcoidosis: a report of two cases

A. Coeytaux[1], H. Emond[2], J. Horvath[2], M. Kurian[2], M. Chofflon[2], T. Landis[2], S. Perrig[3]
[1]*University Hospitals of Geneva,* [2]*Neurology,* [3]*Psychiatry - Sleep Laboratory, University Hospitals of Geneva, Switzerland*

Introduction: Symptomatic narcolepsy has been associated with diseases affecting the diencephalon, but only rarely with neurosarcoidosis. We report of two cases complicated by narcolepsy without cataplexy with negative HLA DQB1*0602 allele.
Case reports: A 53-year-old female was admitted for bilateral deafness, lymphocytic meningitis and panhypopituitarism. MRI showed bilateral VIIIth cranial neuropathy, diencephalic lesions. After extensive work-up, neurosarcoidosis was considered the most probable diagnosis. Five years later, excessive daytime sleepiness (EDS) and sleep attacks developed with hypnagogic hallucinations. PSG showed REM-sleep onset. The MSLT showed a mean sleep latency of 6.20 minutes with two REM sleep onsets (SOREM). CSF hypocretin-1 was 131pg/ml. Prednisone led to lasting improvement in EDS.
A 48-year-old male with a histologically-proven diagnosis of pulmonary sarcoidosis, developed myalgia, headache, EDS two years after a 10-month-treatment course with immunosuppression drugs. Work-up revealed multiple cranial neuropathies (V, VIIth), unilateral upper limb myositis. CSF analysis and level of CSF hypocretin-1 were normal. PSG showed mild positional obstructive sleep apnoea syndrome with central apnoeas. MSLT showed a mean sleep latency of 1.5 minutes with 4 SOREMs. We concluded on neurosarcoidosis with symptomatic narcolepsy. Treatment with a 6-month course of immunosuppression drugs resulted in normal comparative exams. PSG showed a normal respiratory index. MLST showed improved mean sleep latency (12min.) with 1 SOREM.
Conclusions: These two cases illustrate narcolepsy as a late-onset complication of neurosarcoidosis affecting the hypothalamus. Atypical onset of narcolepsy should prompt clinicians to consider sarcoidosis in their differential diagnosis.

P2753

Sleep disturbances in individuals diagnosed with respiratory diseases; asthma, bronchiectasis, COPD and asbestosis

D. Virk
School of Health Sciences and Social Work, University of Portsmouth, Portsmouth, UK

Introduction: Sleep disturbance is a common complaint in various respiratory diseases (Lewis, 1999). Although this area has been the topic of some research, certain respiratory disorders, such as sleep apnoea and chronic obstructive pulmonary disease (COPD), have received more attention than others. In addition, much of the research has been physiological in nature investigating sleep disturbance in terms of objective measures rather than assessing the sleep complaints of the individuals themselves.
Aims: The aims of the present research were to describe in detail than in previous investigations the occurrence and nature of sleep problems and behaviours in patients diagnosed with respiratory diseases compared to healthy controls.
Design: A cross-sectional questionnaire survey of the prevalence and range of sleep disorders was investigated in individuals diagnosed with respiratory diseases, these being asthma (n=46), Chronic Obstructive Respiratory Disease (COPD) (n=18), bronchiectasis (n=16) and asbestos and related diseases (n=11) and their matched healthy controls. The Basic Nordic Sleep Questionnaire (BNSQ) was used to collect data on sleep disorders.
Individuals with respiratory diseases were recruited from the out-patients Respiratory Service at Portsmouth Hospitals NHS Trust, and healthy matched controls were recruited through various sources including University, Portsmouth council and hospital staff.
Results: Patients diagnosed with asthma, COPD, bronchiectasis showed a significantly greater number of sleep problems and behaviours than the healthy controls. Different sleep problems and behaviours were seen in the three respiratory disease groups.
Conclusions: Generally individuals diagnosed with respiratory diseases reported greater disturbances in sleep compared to their healthy controls.

P2754

Restless legs syndrome in depression

S. Happe[1], B.T. Baune[2], M. Lanz[3], K. Berger[4], M. Hornyak[5]
[1]Department of Clinical Neurophysiology, Klinikum Bremen-Ost/University of Göttingen, Bremen, Germany, [2]Department of Psychiatry, James Cook University Queensland, Townsville, QLD, Australia, [3]Epilepsy Center, Department of Neurosurgery, University of Freiburg, Freiburg im Breisgau, [4]Institute of Epidemiology and Social Medicine, University of Münster, Münster, [5]Interdisciplinary Pain Center and Department of Psychiatry and Psychotherapy, University of Freiburg, Freiburg im Breisgau, Germany

Objective: Symptoms of depression and anxiety are frequent in patients with restless legs syndrome (RLS). Recent community-based studies have shown associations between RLS and major depressive disorder and panic disorder. However, little is known whether patients with a manifest depressive disorder have an increased prevalence of RLS and whether there is an association to different depressive disorders.
Patients and methods: Three psychiatry departments in two countries (Germany and Australia) each recruited 100 consecutive patients with current depression. All patients filled in a standardized questionnaire including diagnostic questions for RLS, a depression scale (CESD), and the RLS severity scale (IRLS) if RLS was present. The treating doctors filled in a second standardized questionnaire including RLS-diagnostic questions and comorbidities.
Results: Altogether, 290 questionnaires could be evaluated, 190 in Germany (96 in Bremen, 94 in Freiburg) and 100 in Australia. The Australian patients were younger than the German patients (45.4±13.8 vs. 49.7±15.0 years, p=0.018), the gender distribution was not different (p=0.71). The minimal criteria for RLS were fulfilled by 8.3% of the German and 17.0% of the Australian patients (p=0.017). The treating physicians, blinded to the patient answers, rated 4.3% of the German and 12.4% of the Australian patients as RLS cases. RLS prevalence was similar across subtypes of depression.
Discussion: In Germany, RLS is not more frequent in in-patients with manifest depression as compared to the general population. Possible reasons for the higher prevalence of RLS in depressive patients in Australia are discussed. RLS prevalence does not vary by subtype of depression.

P2755

Automatic sleep scoring in normals and in individuals with neurodegenerative disorders according to new international sleep scoring criteria

P. Jensen[1], H.B.D. Sørensen[1], P.J. Jennum[2]
[1]DTU Electrical Engineering, Technical University of Denmark, Copenhagen, [2]Danish Center for Sleep Medicine, University of Copenhagen, Glostrup Hospital, Glostrup, Denmark

Introduction: Reliable polysomnographic classification is the basis for evaluation of sleep disorders in neurological diseases.
Aim: To develop a fully automatic sleep scoring algorithm on the basis of a reproduction of new international sleep scoring criteria from the American Academy of Sleep Medicine (AASM).
Methods: A biomedical signal processing algorithm was developed, allowing for automatic sleep depth quantification of routine polysomnographic (PSG) recordings through feature extraction, supervised probabilistic Bayesian classification, and heuristic rule-based smoothing. The performance of the algorithm was tested using 28 manually classified day-night PSGs from 18 normal subjects and 10 patients with Parkinson's disease (PD) or multiple system atrophy (MSA). This led to quantification of automatic-versus-manual epoch-by-epoch agreement rates for both normal and abnormal recordings.
Results: Resulting average agreement rates were 87.7% (Cohen's Kappa: 0.79) and 68.2% (Cohen's Kappa: 0.26) in the normal and abnormal group, respectively. Based on an observed reliability of the manual scorer of 92.5% (Cohen's Kappa: 0.87) in the normal group and 85.3% (Cohen's Kappa: 0.73) in the abnormal group.
Conclusion: The developed algorithm was capable of scoring normal sleep with an accuracy around the manual inter-scorer reliability, it failed in accurately scoring abnormal sleep as encountered for the PD/MSA patients, which is due to the abnormal micro- and macrostructure pattern in these patients.

P2756

Age-related changes in sleep quality in an urban Korean elderly population: result from the Korean Longitudinal Study on Health and Aging (KLOSHA)

T.H. Kim
Neuropsychiatry, Seoul National University Bundang Hospital, Seongnamsi, Republic of Korea

Objectives: We examined age-associated changes in sleep quality of Korean elders using the Pittsburgh Sleep Quality Index (PSQI).
Methods: PSQI was administered to the 545 Korean elders of the over 65 years randomly sampled. We excluded those who had major psychiatric disorders according to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) criteria, including dementia and major depressive disorder. We compared global and component scores of PSQI score by age (65-69,70-74, and 75+) and gender using ANOVA and logistic regression.
Results: Global PSQI score was not changed by age ($p=0.11$). The frequency of poor sleeper who got higher than five point on PSQI did not differ by age either (x2-test, $p=0.12$). Global PSQI scores were higher and poor sleepers were more prevalent in women (PSQI scores: 7.05±3.50 vs. 6.04±3.15, $p<0.05$, poor sleeper: 65.7% vs. 52.6%, OR=1.71, $p<0.01$). Among component scores of PSQI, sleep efficiency scores were significantly deteriorated with advancing age ($F=4.83$ $p=0.028$). Subjective sleep quality and sleep disturbance score was worse in women than in men ($F=12.5$, $p<0.0001$, $F=5.01$, $p=0.03$). The interaction of age and gender was significant in subjective sleep quality score ($F=6.63$, $p=0.01$); it deteriorated significantly with advancing age in men but not in women ($F=13.5$, $p<0.0001$; $F=0.26$, $p=0.61$).
Conclusions: Although total PSQI scores did not decline with advancing age, sleep efficiency and subjective sleep quality in men did significantly decline with advanced age. The gender difference in the PSQI scores seem to be attributed to subjective sleep quality and sleep disturbance.

P2757

RLS and women: the experience of a Sicilian sleep medicine centre

I. Aricò, R. Condurso, G. Vita, R. Silvestri
Sleep Medicine Center, Dpt of Neurosciences, Messina, Italy

P2758

Neuro-borreliosis & obstructive sleep apnoea syndrome

A. Buettner
Woosuk University, Samrye-up, Republic of Korea