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P 1001

A classification tool for clinical differentiation between hemorrhagic and ischemic stroke

A. V. Pefanis, S. Efstathiou, D. Tsiolos, A. Tsiakou, I. Zacharos, S. Mastorantonakis, A. Mitromaras, T. Mountokalakis
Sotiria General Hospital, Athens, GREECE

Aim To develop a simple and reliable diagnostic tool for differentiation of cerebral infarction (CIF) from intracerebral haemorrhage (ICH) in order to facilitate therapeutic decisions when rapid access to computed tomography (CT) is lacking.
Patients and methods Thirty variables regarding each patient admitted with acute stroke were prospectively recorded. Multivariate analysis was performed using ICH as end point. CT scan confirmed the stroke type within 72 hours from admission. Three previous scores proposed for stroke differentiation were calculated and compared to the present score.
Results Among 235 patients (119 males) with a mean age of 70.6±11.2 years, 43 (18.3%) had ICH. Independent correlates of ICH were neurological deterioration within 3 hours from admission (OR 17.1 95% CI 5.2–48.2), vomiting (8.4, 2.1–27.4), white blood cells (WBC) >12000/ml (7.9, 2.4–19.5) and de-creased level of consciousness (5.3, 3.3–34.1). On this basis, the following integer-based scoring system was derived for diagnosis of ICH: Number of points =6*(neurological deterioration within 3 hours from admission) +4*(vomiting) +4*(WBC >12000) +3* (decreased level of consciousness). When the cut-offs ≤3 points for CIF and ≥11 points for ICH were used, sensitivity, specificity, and positive and negative predictive values of the score were 95, 99, 97 and 99%, respectively, exceeding noticeably the three previously proposed systems.
Conclusions The proposed model provides an easy to use tool for sufficiently accurate differentiation between hemorrhagic and non-hemorrhagic stroke on the basis of information available to all physicians early after admission.

P 1002

Correlation between sPECAM-1 levels in serum and CSF of acute ischaemic stroke patients and the size of early brain CT hypodense areas

J. Zaremba[1], J. Losy[2]
[1]*Department of Clinical Neuroimmunology, University School of Medicine, Poznan, POLAND,* [2]*Department of Clinical Neuroimmunology, University School of Medicine, Institute of Experimental and Clinical Medicine, Polish Academy of Sciences, Poznan, POLAND*

Introduction Stroke-induced acute inflammatory reaction is believed to play an important role in secondary neuronal damage and infarct extension. Appearance of inflammatory cells in ischaemic cerebrovascular milieu requires prior endothelial-leukocyte interactions that are at least partly enabled by cell adhesion molecules surface expression.
Platelet endothelial cell adhesion molecule-1 (PECAM-1) present at endothelial cell intercellular junctions is required for transendothelial migration of leukocytes. We have recently demonstrated that ischaemic stroke patients displayed increased soluble PECAM-1 isoform (sPECAM-1) levels in serum and cerebrospinal fluid (CSF) within the first 24 hours after the onset of neurological signs.
The aim of the present study was to investigate the relationship between the levels of sPECAM-1 and the size of early brain damage in ischaemic stroke patients.
Methods We have compared sPECAM-1 levels in serum and CSF samples obtained from 23 patients within the first 24 hours of first-ever completed hemispheric ischaemic stroke with the volume of relevant early brain computed tomography (CT) hypodense areas.
Results The mean sPECAM-1 levels in sera and CSF of ischaemic stroke patients was 99.0±38.6 ng/ml and 22.6±18.4 ng/ml, respectively. The average brain CT hypodense areas volume was 10.0±10.7 cm^3. The significant positive correlation between sPECAM-1 levels both in sera and CSF of stroke patients and the volume of early brain CT hypodense areas have been shown ($r=0.94$; $p<0.000001$).
Conclusion The data indirectly suggest that PECAM-1 may be involved in inflammatory response-mediated promotion and extension of early brain damage in ischaemic stroke patients.

P 1003

First month prognosis in hypertensive intracerebral haemorrhage correlated with the adapted Hemphill-Bonovich score

S. Tuta, B. Dumitriu, A. Nistorescu, C. Popa
Institute of Cerebrovascular Diseases Bucharest, Bucharest, ROMANIA

Background The purpose of this study was to compare the correlation between Hemphill-Bonovich score and Glasgow Coma Scale (GCS) in hypertensive cerebral haemorrhage patients, within the first month of outcome.
Methods 86 consecutive patients with CT confirmed hypertensive cerebral haemorrhage admitted in the first 24 hours from onset entered the study after appropriate investigations were done to rule out other causes of bleeding.
We assessed the patient's age, the Hemphill-Bonovich score, GCS score in the first and seventh day from onset, blood pressure on admission, the haemorrhage location and volume, the presence of intraventricular blood and mass effect on CT scans. Statistical analysis was done using the Pearson and Mantel-Haenszel correlation tests.
Results The GCS score varied with more than two points in 69.8% patients between the first and seventh day from onset and was correlated with haemorrhage volume ($p=0.01$), ventricular bleed ($p=0.001$) and the haemorrhage's mass effect ($p=0.0003$). The one-month survival was correlated with haemorrhage

volume (p=0.005), the mass effect (p<0.0001) and Hemphill-Bonovich score (78.8% survival for 0, 1 and 2 score, and 97.7% death for 4, 5 and 6 score, p<0.0001).
The leading cause of death in one month hospitalised patients was cerebral lesion (69.76%) followed by myocardial infarction and bronchopneumonia.
Conclusions The Hemphill-Bonovich score proved to be a reliable scale for clinical and prognosis evaluations of patients having cerebral hypertensive haemorrhage.
The unexpected extra cerebral causes of death and continuing bleeding could lead to lack of correlations between the first day score and further clinical evolution.

P 1004

Direction of flow in the posterior communicating artery on magnetic resonance angiography in patients with occipital lobe infarcts

J. C. F. Jongen[1], C. L. Franke[1], L. M. P. Ramos[2], J. T. Wilmink[3], J. van Gijn[2]
[1]Atrium Medical Centre, Heerlen, NETHERLANDS, [2]University Medical Centre, Utrecht, NETHERLANDS, [3]Academic Hospital, Maastricht, NETHERLANDS

Introduction In some people the blood supply to the posterior cerebral artery is partly or even exclusively via the carotid system. In such cases, an embolus from a carotid stenosis might cause an occipital lobe infarct. We studied the direction of flow in the posterior communicating artery in patients with an occipital lobe infarct and in healthy controls.
Methods We prospectively studied 48 patients with an occipital lobe infarct after a 3–36 months interval and 50 young healthy controls by means of magnetic resonance angiography. Special emphasis was given to the presence of a posterior communicating artery and, if this was present, to the direction of flow.
Results Of all scanned hemi circles of Willis, significantly fewer patients than controls had an exclusive blood supply to the posterior cerebral artery via the carotid system, both in the affected (4%) and in the unaffected hemisphere (3% vs. 14%, 95% CI 8–23%). Also, patients had a patent PcoA with antero-posterior flow less often than controls (affected hemisphere 16%, unaffected hemisphere 24% vs. 35%, 95% CI 25–45%). Individually, significantly more patients showed no antero-posterior flow through the PcoA than controls (77% vs. 51%, 95% CI 41–61%).
Conclusions Supply of the posterior cerebral artery from the carotid system occurs less often in patients with an occipital lobe infarct than in healthy controls, especially when compared to the affected hemisphere. This difference may represent a causal factor (fewer collateral pathways after occlusion of the posterior cerebral artery, leading to infarction) or a consequence (redistribution of blood flow after infarction).

P 1005

Micro platelets and platelet aggregates in stroke and non-stroke patients with increased carotid intima-media thickness

W. Kozubski[1], M. Lukasik[1], M. Rozalski[2], C. Watala[2], P. Guzik[3]
[1]Department of Neurology, University School of Medical Sciences, Poznan, POLAND, [2]Laboratory of Haemostasis and Haemostatic Disorders, Medical University of Lodz, Lodz, POLAND, [3]Department of Cardiological Intensive Care, Poznan, POLAND

Background The relationship between the carotid intima-media thickness (IMT) and hyperactivity of platelets in stroke patients was evaluated in previous studies. The purpose of our investigation was to asses the correlation between increased IMT and platelets activity independently of stroke in patient history.
Material and methods Thirty-seven after stroke patients and 45 non-stroke controls aged 40–79 (mean 58.27 years) were examined. The IMT was estimated with B-Mode ultrasonography. The whole blood microplatelets and platelet aggregates were assessed with flow cytometry in the rest platelets and after 8μM TRAP activation. The results were assessed in 4 groups: non-stroke (A) and stroke (B) patients without increased IMT and non-stroke (C) and stroke (D) patients with increased IMT. The border IMT values differentiated groups were maximal common carotid artery IMT ≥1.5 mm and maximal bulb IMT ≥2.0 mm. The statistical evaluation was performed using non-parametric ANOVA tests.
Results The mean value of the rest micro particles fraction and the aggregates account after TRAP stimulation were significantly greater in the subgroups with increased IMT independently of the acute ischemic event (respectively p=0.0001 and p=0.0451). Similar tendency was found in the rest platelets aggregates fraction, but differences were statistically not significant. Differences between subgroups in mean micro platelets value after TRAP activation were not statistically significant.
Conclusions The platelets activity markers seem to be related to the increased IMT and are not depended on the ischemic event. Platelet activation is probably primary to stroke and acute ischemia only increases previous activity changes.

P 1006

The impact of the ageing index on stroke-related variables: stroke subtypes, case fatality and mortality.

P. J. Modrego[1], M. A. Pina[2], F. J. Lerin[2], A. Mayor[1], P. Beguer[1]
[1]Hospital de Alcañiz, Alcañiz, SPAIN, [2]Hospital de Teruel, Teruel, SPAIN

Introduction During the last three decades there have been important advances in the diagnosis and treatment of stroke with important decline in mortality in western countries. However, the longer expectations of life in elderly people may overturn these tendencies. The purpose of our work is to analyse the impact of a high ageing index on stroke-related variables such as vascular risk factors, stroke subtypes, fatality rates and mortality.
Methods We analysed the data of 1,850 consecutive patients with first-ever stroke retrieved from a prospective registry through a period of 8 years (from 1994 to 2001) in the province of Teruel, Spain. The mean age was 75.5 years and 62% were male. The variables taken into account were: vascular risk factors, stroke subtypes, fatality and mortality. Mortality rates were calculated from 1990 to 1999.
Results Arterial hypertension and atrial fibrillation remain as the most frequent risk factors. We observed an increasing frequency of cardioembolic stroke. The mean case fatality rate was 16.6% with no differences for sex. Crude mortality rates were higher than in Spain and ranged from 169 to 142/100,000 with higher rates for women. The age-adjusted mortality for the European population was 56.6 in the year 1999, somewhat lower than in Spain (61/100,000) and in other western countries.
Conclusions Whereas mortality by stroke declined and stabilised in our province and in Spain in the last decade, however fatality rates have significantly increased in our province due to the high proportion of elderly people, the severity of stroke and complications.

P 1007

Seasonal distribution of stroke occurrence in the Greek capital city; a hospital-based study

K. Spengos[1], K. N. Vemmos[2], G. Tsivgoulis[2], A. Synetos[2], V. Kotsis[2], V. P. Zis[1], D. Vassilopoulos[1]
[1]Dept of Neurology, University of Athens Medical School, Athens, GREECE, [2]Dept of Clinical Therapeutics, University of Athens Medical School, Athens, GREECE

Background A series of studies described in many different countries a temporal distribution of stroke throughout the year with a peak of stroke occurrence in the colder months of the year. We investigated the temporal pattern of stroke incidence in Greek stroke patients.
Methods A series of 1,299 stroke patients was admitted to our hospital between January 1993 and December 2000. Stroke was classified according to the criteria of "The Athens Stroke Registry". Assuming an equal distribution of stroke presentation over the whole year, we compared the observed number of stroke patients per month with the expected frequency using the "x^2 for goodness to fit" techniques, along with 95% confidence intervals.
Results January and March were the months with the highest stroke incidence (n=123). August was the month with the fewest stroke cases (n=73). There were significantly more strokes observed during the colder period of the year (October–March), than during the warm period between April and September (x^2=14.03; df=1; p<0.001). The observed monthly distribution of stroke occurrence also differed significantly from the hypothetical equal one (x^2=25.9; df=11; p<0.001).
Conclusions Our results suggest a significant higher stroke incidence during the autumn and winter months and are in accordance with findings from other European, American and Australian studies.

P 1008

Sex differences in ischemic stroke fatality outcome in Croatia

J. Palic[1], D. Janculjak[1], V. Demarin[2], I. Lusic[3], B. Barac[1], D. Vukasinovic[1], I. Bradvica[1]
[1]Osijek University Hospital, Osijek, CROATIA, [2]Hospital S. Milosrdnice, Zagreb, CROATIA, [3]Split University Hospital, Split, CROATIA

Background Continental regions (Osijek and Zagreb) have higher incidence of ischemic stroke than the coastal region (Split).
Objective To examine the influence of gender on the lethal outcome of ischemic stroke patients treated in three regional stroke centres in Croatia.
Methods We analysed three cohorts of ischemic stroke patients hospitalised during one year (181 in Osijek, 204 in Split and 138 in Zagreb). More male patients were hospitalised in Osijek (53.6%) and Split (53.9%) than in Zagreb (41.3%).
Results The total case fatality rate of ischemic stroke was significantly higher in the continental centres (Osijek 39.8% and Zagreb 42.8%) than in the coastal centre (Split 26%). Male patients had a reliably higher lethal outcome than female patients in Osijek (48.5% vs. 29.8%) and in Zagreb (49.1% vs. 38.3%). In Split we observed the opposite situation: female patients had a relatively higher fatality rate than the male patients (28.7% vs. 23.6%), (not significant). Female patients in both Osijek and Split had nearly the same proportion of fatalities, unlike male patients. The relative death rate between the group of female patients older than 65 years compared to those under 65 is higher in Split (7.4) than in Zagreb (3.6) or in Osijek (2.5).
Conclusion Male gender is associated to the higher fatality outcome of ischemic stroke within population with higher burden of risk factors (continental Croatia). The gender has not much influenced the outcome of stroke in the population with lower prevalence of risk factors for stroke (coastal Croatia).

P 1009

The population-based study of stroke incidence in Grodno, Belarus

S. D. Kulesh, Y. Y. Gordeev
Medical University, Grodno, BELARUS

Introduction No population-based studies of stroke incidence have been performed yet in Belarus.
Methods All suspected strokes occurred among 307 122 residents of Grodno-city during a 12-month period of 2001 were identified and assessed for all age groups. Multiple overlapping sources of notification were used to ascertain cases, and standard criteria for stroke and case-fatality were used.
Results During the study period 907 cases of strokes among 889 persons were registered, with 676 being first-ever-in-a-lifetime strokes (FEL). The diagnosis and pathological type of FEL were confirmed by CT or autopsy in 35%, patient age ranged from 25 to 95 years (mean±SD age, 65.5±11.4 years). The crude incidence rate for FEL was 220.1 per 100 000 (95% confidence intervals [CI], 203.5 to 236.7), the rate standardized to the European population was 299.7 per 100 000 (CI, 280.3 to 319.1). FEL incidence rates rose steeply with age in both sexes and were higher in men in all age groups. Rate of hospitalisation was 87.7%; the 28-day case fatality rate was 28.3% (CI, 24.3% to 32.3%). Of the 676 FEL, 522 (77.2%) were cerebral infarction (161 definite and 361 probable), 93 (13.8%) were intracerebral haemorrhage (68 definite and 25 probable), 22 (3.2%) were definite subarachnoid haemorrhage and 39 (5.8%) were stroke of undetermined type.
Conclusions Stroke incidence and case-fatality rates in Grodno were found to be of highest among other studies. The increment of age-standardized incidence depended on high FEL rate in subjects aged 55 to 74 years.

P 1010

Occurrence of risk factors of spontaneous intracerebral and subarachnoid haemorrhages in the Olomouc region, Czech Republic

R. Herzig[1], I. Vlachova[1], K. Urbanek[1], B. Krupka[1], M. Gabrys[2], J. Mares[1], D. Sanak[1], P. Schneiderka[3], S. Burval[4]
[1]Stroke Center, Clinic of Neurology, Faculty Hospital, Olomouc, CZECH REPUBLIC, [2]Clinic of Neurosurgery, Faculty Hospital, Olomouc, CZECH REPUBLIC, [3]Department of Clinical Biochemistry, Faculty Hospital, Olomouc, CZECH REPUBLIC, [4]Clinic of Radiology, Faculty Hospital, Olomouc, CZECH REPUBLIC

Introduction Several risk factors (RFs) play a role in the aetiopathogenesis of spontaneous intracranial haemorrhages (SICHs). The aim of this prospective study was to evaluate the role of RFs, which can be influenced, in particular SICH subtypes.
Methods The authors evaluated a group of 105 patients with SICHs, of which 88 haemorrhages were intracerebral (ICH), and 17 were subarachnoid/intraventricular (SAH/IVH) in loca-

lization. The presence of the following RFs and their combinations was evaluated: arterial hypertension (AH), diabetes mellitus/impaired glucose tolerance (DM/IGT), obesity, dyslipidaemia, efficient oral anticoagulation and other coagulopathies, thrombocytopenia, salicylates and oral contraceptives therapy, drug abuse, smoking, acute and chronic alcohol intake. Chi-square tests were applied for the testing of statistical significance.

Results The occurrence of the following RFs was significantly higher in ICH than in SAH/IVH patients: AH in 64.8% versus 23.5% (p=0.002), DM/IGT in 36.4% versus 5.9% (p=0.013), hypercholesterolemia (HCH) in 72.7% versus 47.1% (p=0.037), and combinations of AH + DM/IGT in 26.1% versus 0% (p=0.017), AH + HCH in 51.1% versus 17.6% (p=0.011), DM/IGT + HCH in 23.9% versus 0% (p=0.024). On the contrary, the combination of chronic alcohol intake + active smoking was more frequent in SAH/IVH than in the ICH patients – in 31.2% versus 12.0% (p=0.053).

Conclusion AH, DM/IGT and HCH including their mutual combinations play the most important role in the aetiopathogenesis of spontaneous ICH, while the combination of chronic alcohol intake with active smoking plays an important role in the aetiopathogenesis of spontaneous SAH/IVH in our population.

P 1011

Time between stroke onset and admission to the hospital

J. Eross, I. Pascu, J. Gebefugi, J. Szasz, S. Nicolescu, S. Szatmari

Department of Neurology, University of Medicine and Pharmacy, Targu-Mures, ROMANIA

Introduction For the outcome of stroke the early diagnosis and therapy is very important. Every minute lost, from the onset of symptoms to the time of emergency contact, cuts into the limited window of opportunity for intervention. In our study we followed the time passed between the onset of stroke and the patients admission to the hospital.

Methods We performed a prospective epidemiological study, including all patients treated with acute stroke in the County Clinic of Mures between October 1, 1999 and September 30, 2000.

Results In the mentioned period we studied 261 patients with an acute stroke event. About 39% of patients arrived at hospital within 3 hours, 54% of stroke patients arrived within 6 hours. During the first 3 hours we admitted 50% of haemorrhages and 36% of ischaemic strokes. 74.5% of those who arrived within 3 hours had severe or moderate neurological deficit. Among the total of 203 ischaemic stroke patients 179 had less then 22 points on the National Institute of Health Stroke Scale (NIHSS) but only 35.8% of them arrived within 3 hours. Age, sex and marital status showed no significant influence on admission time.

Conclusions Patients with more severe onset of stroke ask for urgent transport more frequently. Early diagnosis and therapy will be possible after public education and training courses for general practitioners.

P 1012

Frequency, aetiology, and prevention of stroke in patients with systemic lupus erythematosus

A. K. Zacharof[1], C. Flevaris[1], C. Petrogianopoulos[1], D. Poulikakos[1], N. Korovessi[1], G. Latsios[1], H. Zacharof[2], L. Zacharof[3]

[1]Hellenic Red Cross Hospital, 2nd Department of Internal Medicine, Athens, GREECE, [2]University of Athens School of Philosophy, Athens, GREECE, [3]Pantion University School of Social Cultures, Athens, GREECE

Introduction The main symptoms of CNS lupus can be diffuse (generalized seizures, psychosis) or focal (stroke, peripheral neuropathies). Neuropsychiatric symptoms often occur in the first year of SLE, but are rarely the presenting symptoms.

Patients and Methods We prospectively and retrospectively reviewed, from 1986 to 2001, the incidence aetiology and the prevention of stroke in 69 hospitalised patients with systemic lupus erythematosus (SLE).

Results Stroke occurred in 10 (14%) of our patients with documented SLE; six (60%) of the 10 had multiple cerebral infarcts. Factors associated with stroke were: systemic thrombosis, elevated partial thromboplastin time, age over 60 years, transient ischemic attacks, previous stroke, and cardiac valvular disease. The major period of risk for the first stroke was during the first 4.5 years of SLE. The most frequent aetiology was a cardiogenic embolus, with cerebral vasculitis occurring (one patient) only in association with infection. Because of the decreased fibrino-lysis seen in patients with SLE, anticoagulant therapy may be the most effective preventive treatment currently available. Anticoagulant therapy seemed to prevent recurrent focal cerebral ischemia in our patients and was associated with relatively few and minor complications. Patients with a history of tran-sient ischemic attacks or cardiac valvular lesions are at high (50% and 75%, respectively) risk of stroke. Patients who have had a stroke are at high (63%) risk for a recurrent stroke.

Conclusions Most CNS events in patients with SLE are transient, benign and we recommended for all of these patients anticoagulant therapy.

P 1013

Stroke risk factors in Tbilisi: An interim data analysis of the first population-based study in Georgia.

A. Tsiskaridze[1], M. Djibuti[2], G. Lomidze[1], R. Shakarishvili[1], G. Devuyst[3], J. Bogousslavsky[3]

[1]Sarajishvili Institute of Neurology and Neurosurgery, Tbilisi, GEORGIA, [2]Department of Public Health and Epidemiology, State Medical Academy, Tbilisi, GEORGIA, [3]Department of Neurology, CHUV, Lausanne, SWITZERLAND

Background Although stroke is one of the major public health problems worldwide, data on risk factors and other epidemiological patterns of stroke in Georgia are still lacking.

Methods In the framework of the ongoing joint Swiss-Georgian prospective population-based project on stroke epidemiology in Tbilisi, capital of Georgia, we analysed interim data regarding stroke risk factors. For the data collected in a case-control manner, crude and adjusted odds ratios (OR) with 95% confidence intervals (CI) were calculated. Eighty-five consecutive patients with ischemic stroke (36 men and 49 women; mean age 66.4±9.5 years) and 85 age- and sex-matched controls (mean age 67.1±9.9 years) were studied.

Results In a multivariate logistic regression analysis of demographic, anamnestic and clinico-laboratory variables, stroke was significantly associated with higher Body Mass Index (OR 6.8,

95% CI 2.2 to 21.2), lower formal education level (OR 0.2, 95% CI 0.1 to 0.6), arterial hypertension (OR 6.0, 95% CI 2.3 to 15.1), atrial fibrillation (OR 4.8; 95% CI 1.6 to 14.1) and history of transient ischemic attacks (OR 10.2; 95% CI 1.41 to 74.4).

Conclusion The present study outlined significance of some risk factors of stroke in Georgian population. We failed to reveal association of ischemic stroke with other traditional risk factors such as smoking, alcohol consumption, diabetes mellitus and hypercholesterolemia, which may be explained by a different risk factors profile for a defined Georgian population caused by geographical and lifestyle variations.

P 1014

"Mixed Stroke" in Hallym stroke registry – prevalence and clinical patterns

B. Lee, J. Sohn, K. Yu
Dept. of Neurology, Hallym University College of Medicine, Anyang, REPUBLIC OF KOREA

Background "Mixed stroke", ischemic infarction combined with intracerebral haemorrhage, is not rarely appeared on brain imaging study of stroke patient, however, few studies addressed the prevalence or clinical characteristics of mixed stroke. We explored the incidence and clinical patterns of mixed stroke on large hospital-based stroke registry.

Methods We retrospectively collected the clinical data and MR imaging from Hallym Stroke Registry Data Bank between March 1993 and February 2001. We defined mixed stroke as ischemic stroke combined with MR evidence of coexisting old ICH or hemorrhagic stroke combined with MR evidence of coexisting old infarct. Two neuroradiologists independently assessed MR images without the knowledge of clinical findings. Vascular risk factors of mix stroke were compared with those of other ischemic stroke subtypes.

Result Of total 1,988 cases, 112 cases (6%) were mixed stroke. The clinical patterns of mixed stroke were as follows: large artery atherosclerosis with previous haemorrhage (35, 31%); small vessel occlusion with previous haemorrhage (32, 29%); hemorrhagic stroke with previous ischemic stroke (25, 22%); cardioembolism with previous haemorrhage (3, 3%); incomplete evaluation (12, 11%); two or more causes (5, 4%). The history of previous stroke and hypertension were more frequent in mixed stroke than other ischemic stroke subtypes.

Conclusion In our study, the prevalence of mixed stroke was 6%, which should not be neglected. We speculated that mixed stroke may share some identical pathophysiology with ischemic stroke subtype, and may has the impact on the decision of antiplatelet or anticoagulant therapy in ischemic stroke for secondary stroke prevention.

P 1015

Late outcome and risk factors in ischemic stroke patients with early infarct sign

A. Hengirmen[1], M. Neyal[2], M. Ikidag[3], A. Neyal[4], A. Sirikci[5]
[1]Gaziantep University, Gaziantep, TURKEY, [2]Gaziantep University Department of Neurology, Gaziantep, TURKEY, [3]Gaziantep University Department of Radiology, Gaziantep, TURKEY, [4]Gaziantep State Hospital, Gaziantep, TURKEY, [5]Gaziantep University Department of Radiology, Gaziantep, TURKEY

Stroke is the 3rd most common cause of death. Early diagnosis is important both for prognosis and the treatment deciding. This study is designed to examine the prevalence and the diagnostic value of short and long-term prognosis of patients and the coincidence of risk factors of stroke. Out of 326 acute stroke patients admitted to the emergency room, 110 cases with non-contrast CT within 12 hours of stroke onset have been included into the study. Early infarct signs could be diagnosed on 47 (%43.6) CT scans and not visualized on 63 (%56.4) CTs. Outcomes were followed and assessed with the Barthel scale. There was no relationship between the early infarct signs and the group of death or dependent survivors. Early infarct signs were less frequent in the group of good outcome. The subgroups of early infarct signs were observed as the following: %40.4 sulcal effacement, %31.9 loss of gray-white matter line, %29.8 hyperdense middle cerebral artery, %23.3 loss of internal capsule. There was no correlation between the risk factors as cigarette smoking, alcohol intake, OKS drugs, high triglyceride and cholesterol levels and diabetes. Hypertension was significantly more frequent with cases of early infarct signs. There was no significant relationship between the timing at which CT was performed and the presence of early infarct signs. If it is detected on CT scan, early infarct signs may provide a simple tool in evaluating the prognosis of patient and treatment selection by allowing the prediction of subsequent infarct location.

P 1016

Stenosis of the internal carotid artery and its association with ischemic stroke subtypes – ultrasonographic study

P. P. Mineva[1], D. I. Hadjiev[2], I. C. Manchev[1], M. I. Vukov[2]
[1]Thracian University, Medical Faculty, Stara Zagora, BULGARIA, [2]Medical University, Sofia, BULGARIA

Few papers have focused on associations of the different degrees of carotid stenosis with ischemic stroke subtypes. The aim of this case-control study was to determine the relationships between internal carotid artery stenosis of different degrees and ischemic stroke subtypes.

Fifty consecutive patients, 30 men and 20 women, with first-ever anterior circulation infarcts, aged 50–79 years, were enrolled in the study. All patients underwent physical examination, brain computed tomography, Duplex scan, electrocardiography and laboratory investigations. Control group was formed from 100 age- and sex-adjusted persons without cerebrovascular disease.

Significant relationships between carotid stenoses of different degrees and all subtypes of ischemic stroke were found. No significant associations of the carotid stenoses with cardioembolic and with lacunar infarcts were observed. Infarcts due to large-artery atherosclerosis were significantly related to all carotid stenoses (OR=3.71; 95% CI, 1.01–13.54). Infarcts of undetermined cause were found significantly associated with mild carotid stenosis (OR=4.10; 95% CI, 1.11–15.14), but not with moderate and severe one, suggesting that hemodynamic mechanism were not important in their occurrence. The non-cardioembolic infarcts, put together, were significantly related to mild (OR=4.59; 95% CI, 1.63–12.96), moderate and severe (OR=4.56; 95% CI, 1.09–19.12) and with all carotid stenoses (OR=4.59; 95% CI, 1.65–12.74).

In conclusion, Duplex scans may help clarify the pathogenesis of the different ischemic stroke subtypes.

P 1017

Acute phase reactants in peripheral blood and CSF in ischemic stroke as outcome predictors at 1 month

M. Z. Beridze, R. R. Shakarishvili, M. T. Janelidze
State Medical Academy of Postgraduate Education, Tbilisi, GEORGIA

Introduction The study aimed at defining the blood and CSF levels of cytokines: interleukin-1b (IL-1b), interleukin-6 (IL-6), tumour necrosis factor-a (TNF-a) in 48 hours of stroke onset and their relations toward the outcome at 1 month.
Methods 55 patients aged from 45 to 75, 32 female and 23 male, were investigated. Initial disorders assessed by NIHSS and GCS (Glasgow Coma Scale). Patients divided into 2 groups: I group–26 patients (GCS<9; NIHSS>15), II group–29 patients (GCS>9; NIHSS<15). Control comprised 22 healthy individuals. Outcomes evaluated by Barthel Index (BI) and Glasgow Outcome Scale (GOS). Cytokines measured by ELISA assay. Mean values compared by paired-t test. Correlation defined using the Pearson Correlation Coefficient.
Results In 48 hours of stroke onset the blood and CSF levels of IL-1, IL-6 and TNF-a were higher in stroke population compared to control (P0.5) and (34.14±4.25 versus 30.4±6.2 P>0.5), while the IL-6 and TNF-a blood and CSF levels were different between groups (58.8±12.4 versus 34.2±8.8 P<0.2) (80.4±12.55 versus 45.18±3.6 P<0.01) and (28.2±7.8 versus 21.28±4.4 P<0.5) (44±6.4 versus 39.4±7.8 P<0.5) respectively. Negative correlation was found between IL-6 blood and CSF initial levels and outcome of stroke at 1 month (R=–0.92; P<0.001)
Conclusion High blood and CSF initial level of IL-6 are the valid predictors of stroke outcome at 1 month.

P 1018

CXCL1 (GRO-alpha) is increased in the cerebrospinal fluid of patients with ischemic stroke

J. Losy[1], J. Zaremba[2]
[1]Department of Clinical Neuroimmunology, University School of Medicine, Institute of Experimental and Clinical Medicine, Polish Academy of Sciences, Poznan, POLAND, [2]Department of Clinical Neuroimmunology, University School of Medicine, Poznan, POLAND

Introduction Animal models of stroke revealed that cerebral ischemia results in an increased expression of several cytokines and chemokines that precede leukocyte infiltration into ischemic lesions. The infiltrated leukocytes contribute to tissue injury in stroke. CXCL1 (GRO-alpha) is a potent neutrophil chemo-attractant and activator belonging to CXC chemokines family acting through CXCR2 receptors. It may play an important role in neutrophil infiltration in stroke patients.
Methods GRO-alpha was determined in the CSF and sera of 23 ischemic stroke patients 24 hours after the onset of neurological symptoms. The diagnosis was based on clinical history and neurological examination and was confirmed by brain CT. 15 individuals with diagnosis of tension headache served as a control group. GRO-alpha levels in CSF and sera were quantified by ELISA (Quantikine R&D Systems, USA).
Results The CSF GRO-alpha level in ischemic stroke patients was 65.6+/–22.3 pg/mL and was significantly higher (p<0.0001) than that of the control group, in which the level was 43.8+/–2.3 pg/mL. Serum GRO-alpha level in stroke patients was 86.9+/–25.1 pg/mL and did not differ from control group: 85.5+/–31.8 pg/mL.
Conclusion The results suggest that GRO-alpha may play a role in the inflammatory reaction during the early phase of ischemic stroke making it a potential target for therapeutic intervention.

P 1019

Using artificial neural network in predicting the outcome in haemorrhagic stroke

C. Falup-Pecurariu, D. Minea, D. Luca, I. Radu
Department of Neurology, Brasov, ROMANIA

Background Artificial neural networks are an alternative to linear statistic methods in prediction. The three main characteristics are: the capacity to learn, to generalise and to synthesise. The **aim** of this study is to predict the outcome at hemorrhagic stroke patients.
Patients and method Prospective study on 104 patients with hemorrhagic stroke from Department of Neurology Brasov in the period 01.12.2000–31.12.2001. We used the following parameters (input data): the age, sex, blood pressure, site of haemorrhage, dimensions, GSC, risk factors. The design of neural network was with 8 artificial neurons (input) and 2 neurons as output (death or survival). There were 2 groups: A– survivals and B– deaths.
Results In group A there are 76 (73.07%) patients and in group B 28 (26.93%). The mean arterial pressure in group A was 110.25+/–26.25 and in group B 138.53+/–30.15 mmHg. GSC was 11.4+/–3.9 in group A and 6.3+/–2.1 in group B. The input data were computed in Neural Network software with backpropagation algorithm. With each circle the bias was lower. The learning rates were different 0.1, 0.3 and 0.5 and the convergence was obtained for 0.1. We can predict correctly with this method 73.5% of deaths and 77.6% of survivals.
Conclusions Applying artificial neural network gives a prognosis value, as quick as we obtain convergence value we minimize the errors and case discrimination is faster.

P 1020

Clinical diagnosis of acute non-hemorrhagic stroke

S. R. Lukic
University Clinical Centre Nis, Clinic of Neurology, Nis, YUGOSLAVIA

Purpose Reliability evaluation of the score system based on the eight simple clinical variables, to predict the diagnosis of acute stroke in our patient sample.
Methods In our department we made prospective evaluations of the 500 consecutive patients with symptoms of acute neurological signs of vascular origin.
A competent neurologist filled the variables for the score calculations into the special electronic form, in blinded manner on admission. Analysed group had 107 patients who satisfied the inclusion criteria: 1) hospitalised within 48h from the onset of symptoms; 2) without history of previous stroke; 3) without any anticoagulant therapy; 4) supratentorial clinical signs; 5) symptoms lasting more than 24h; 6) performed cranial computed tomography (CT) between 2–21 days from the onset of symptoms; 7) diagnosis of definitive stroke.
Score results were tested for validity: sensitivity, specificity, positive and negative predictive values, and overall accuracy. Confidence intervals (CI) were calculated for alpha =0.05.
Results The prevalence of non-hemorrhagic stroke was 64.49% (CI 54.65%–73.5%). Scores results were "uncertain" in 74.77% (CI 64.45%–82.67%) cases. Sensitivity and positive predictive values for non-hemorrhagic stroke were 0.40 (CI 0.28–0.52) and 1 (CI 0.91–1). Overall accuracy was 0.62 (CI 0.52–0.71).

According to these data, of 1000 patients with acute stroke, 252 would be correctly and 0 wrongly diagnosed as "non-hemorrhagic" while for 748 patients the score results will be "uncertain".
Conclusions Clinical diagnosis of non-hemorrhagic stroke could be make using the simple clinical scoring system within limited numbers of patients, with significant predictive value.

P 1021

Multiple approaches for detecting "blind sight" in occipital ischaemic lesions

R. Cruce[1] A. Sahraie[2], C. Trevethan[2], S. Della Sala[2], A. Ardelean[3]
[1]UMF Craiova, ROMANIA; [2]University of Aberdeen; U.K. [3]University "Vasile Goldis", Arad, ROMANIA

Background Patients with occipital lesions may still be able to detect certain events within the "blind" field – the blind sight phenomenon.
Patients and method We explored residual vision in a patient (CS) with an ischaemic occipital lesion, in the Vision Research Laboratories, University of Aberdeen.
We used a multiple approach: psychophysical investigation – detection of gratings of varying spatial and temporal frequencies, pupillometry – using a ASL 5000 pupillometer and motion discrimination of a circular target.
Results CS' performance in detecting temporally modulated spatial gratings is well above chance for spatial frequencies below 3.5c/s. For an abrupt onset, awareness is considerably higher for 10 Hz modulated than for static stimuli; both detection and awareness dropped significantly for static stimuli of slow onset. Direction discrimination and reported awareness improved with increasing stimulus speed, with a peak sensitivity of 10 deg/s. Blind-field pupillary responses have low-pass properties and extend to higher spatial frequencies.
Conclusions This study emphasises the importance of multiple approach for the documentation of blind-sight. The experimental paradigm, the spatial frequency and the temporal modulation of the stimulus influence target detection. Pupillometry proved to be an efficient objective method that reveals residual capacities within the blind field.
We hope that studies on blind-sight might help future designing of rehabilitation strategies for patients with visual field deficits.

P 1022

Ultrastructural analysis of dermis and sural nerve biopsies in Cadasil

V. Lackovic[1], N. Sternic[2], V. Kostic[2], A. Pavlovic[2], M. M. Labudovic Borovic[1], M. Bajcetic[1]
[1]Institute of Histology and Embryology, Faculty of Medicine, Belgrade, YUGOSLAVIA, [2]Institute of Neurology, Clinical Center of Serbia, Belgrade, YUGOSLAVIA

Introduction CADASIL was identified as a disease that predominantly affects the small cerebral arterial vessels. This study reviews the main clinical and histopathological considerations of two recently discovered cases in Serbia.
Methods In order to establish the diagnosis, clinical evaluation, laboratory findings and imaging procedures were obtained. As the analyses suggested CADASIL, dermal and sural nerve biopsy was performed. The tissue specimens were processed for the light and transmission electron microscopy.
Results The first case, MD, was a 51-year-old male who had two stroke-like episodes at the age of 46 and 48. Investigations revealed high blood pressure and deficit of factor XII. He had spastic dihemiparesis. The other patient, LR, a 49-year-old male, suffered from migraine without aura for the last 37 years, without other vascular risk factors. His father, uncle and son also suffered from migraine. His father had a stroke. Neurological examination showed left hemiparesis and depression. In both patients MRI suggested CADASIL.
The morphological study showed marked disruption of smooth muscle cells in affected blood vessels. These cells appear to be separated from the endothelial layer of the arteriole. Adjacent to smooth muscle cells the accumulations of granular osmiophilic material (GOM) were identified. The biopsy of the sural nerve showed signs of axonal atrophy, shrunken myelin sheath with myelin loop at the level of Schmidt-Lanterman incisure and degenerating endoneurial fibroblasts.
Conclusions Considering the described clinical and histological features of the patients involved, we concluded that two new cases of CADASIL could be registered in Serbia.

P 1023

Cerebral blood SPECT imaging in vascular left hemisphere-damaged patients with aphasia

D. Gasecki[1], K. Jodzio[2], P. Lass[3], W. M. Nyka[1], G. Kozera[1], M. Derejko[3]
[1]Medical University Neurological Department, Gdansk, POLAND, [2]Institut of Psychology, Gdansk, POLAND, [3]Medical University Department of Nuclear Medicine, Gdansk, POLAND

Background Left hemisphere is crucial in most right-handed individuals for language functions. However, the relationship of portions of the perisylvian cortex to different components of the language-processing system remains the subject of controversy.
Methods The aim of this study was to measure rCBF in 20 right-handed left hemisphere-damaged acute stroke patients using single photon emission-computed tomography (SPECT). Presence of a single left-sided vascular brain lesion was confirmed on CT and/or MRI.
Language disorders, assessed with a battery of the Boston Diagnostic Aphasia Examination and the Boston Naming Test, were divided into 2 groups: I – non-fluent aphasia, II – fluent aphasia.
Results Non-fluent aphasics compared to fluent aphasics had more extensive hypoperfusion in the left frontal cortex and in the left basal ganglia and the left thalamus. The overall severity of aphasia positively correlated with index of hypoperfusion in the left basal ganglia and to the lesser degree in the left thalamus.
Conclusions CBF SPECT imaging may provide a reliable description of the brain pathology associated with aphasia. CBF SPECT imaging is useful in elucidating aphasic syndromes and their differential diagnosis. Results emphasise the role of the left subcortical structures in language processing.

P 1024

Is it an embolism? Discrepancy between magnetic resonance angiography (MRA) and follow-up conventional angiography

C. Kyung Cheon
Department of Neurology, Kyung-Hee University Hospital, Seoul, REPUBLIC OF KOREA

Background We question the possibility of direct embolic occlusion of the internal carotid artery (ICA) at the cervical segment with complete resolution in a few days.

Case A 37-year-old man presented left hemiparesis with sensory impairment. One day ago, he experienced three episodes of transient left hemiparesis persisted for a few minutes.
Three days after admission, FLAIR and diffusion-weighted magnetic resonance (MR) images and angiography of brain were performed. MR images showed a subcortical increased signal intensity in the right middle cerebral artery (MCA) region. MR angiography showed drop-out signal of the right ICA 3cm cranial to the bulb, decreased signal of right intracranial ICA and middle cerebral artery.
Four days later, conventional cerebral angiography was performed. It showed fully patent findings of the right ICA and the right MCA through the entire portion.
Conclusions In most cases of embolic occlusion of ICA, angiography shows occlusion of ICA in its supraclinoid portion with retrograde clot extension giving tailing off appearance to the column of contrast material in the more proximal artery. In our case, conversely, MR angiography showed a filling defect in proximal portion implying the proximal ICA lesion.
Despite diagnostic efforts, the aetiology of cerebral ischemic accidents in this patient remains unclear. Although it is a very unusual site for lodgement of emboli and the source was not found, the clinical and radiological findings favour the impaction of an embolism to the proximal portion of the ICA. We think that the embolus has come from the heart or great vessels.

P 1025

Carotid intima-media thickness in young patients with newly diagnosed hypertension – detection by colour duplex ultrasound

M. Wawrzynczyk, K. Pierzchala
Silesian School of Medicine, Zabrze, POLAND

Background and objective Hypertension is an important risk factor for the development of arteriosclerosis and prevalence of stroke. Early stages of vascular changes can be reliably recog-nized by measuring the thickness intima and media complex /IMT/. The aim of this study was to examine carotid arteries and occurrence of other risk factors in patients below 50 years of age, with newly diagnosed hypertension /interval since diagnosis <or=1 year/.
Material and methods Examined population consisted of 16 patients /12 men and 4 women/. Colour duplex ultrasound of carotid arteries was performed, including far-wall IMT measurements and evaluation of occurrence of plaques and flow velocities abnormalities. Obtained laboratory data were level of glucose and blood lipids.
Results Greater than normal IMT />or=1 mm/ was measured in 2 patients /12.5%/. Mean CCA IMT was 0.76 mm. In 1 patient occurrence of plaques in distal CCA and proximal ECA was detected, with increased blood flow velocities and local turbulences. In examined population level of glucose was within normal range, elevated level of total cholesterol, LDL and triglycerides we obtained respectively in 9 /56%/, 4 /25%/ and 2 /12.5%/ patients, including patients with IMT thickening and plaques. There were 2 /12.5%/ smokers in examined group.
Conclusions Colour duplex ultrasound is useful method for detecting arteriosclerotic lesions. In patients with early stage of hypertension both type of vessel changes, subclinical or advanced, are observed. Blood lipids abnormalities are often accompanying risk factors for those patients.

P 1026

Non-invasive imaging of vasoconstriction of internal carotid arteries in a stroke patient

A. Hengirmen[1], M. Neyal[1], A. Özkur[1], A. Neyal[2]
[1]Gaziantep University, Gaziantep, TURKEY, [2]Gaziantep State Hospital, Gaziantep, TURKEY

We report a 21-year-old female case referred for a progressive motor aphasia and right hemiplegia. Cranial magnetic resonance imaging (MRI) was normal other than a parenchymal chronic lacunar infarct. Physical examination and blood tests were normal except slight anaemia. Duplex ultrasonography (USG) on the 48th hours of admission revealed a very low waveform on the proximal part of the left internal carotid artery (ICA) and the left ICA couldn't be visualized on cranial magnetic resonance angiography (MRA). A control MRI on the 3rd day revealed acute ischaemic lesions in the left caudate nucleus and left frontal white matter. A full screen test battery for vasculitis has been completed, which was negative. Despite the initial negative physical and laboratory findings, vasculitis was thought to be the most probable diagnosis. Methylprednisolon 1gr/day, IV was administered. On the third day of treatment, normal waveform in the left ICA by duplex USG and a nearly normal visualization of both ICAs by MRA were reported. Repeated tests for vasculitis was positive for ANA, anticardiolipin antibody Ig M and G.
Attacks of vasoconstriction of internal carotid arteries that had been shown by duplex USG as well as by MR angiography, which reply very well to steroids in a few days, is not a very common presentation of vasculitis. The prognosis and unusual imaging of this case presumed to be interesting. Non-invasive, quick and inexpensive techniques, like duplex USG and cranial MRA, may be preferable with the highest priority.

P 1027

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

D. Russell[1], R. Brucher[2]
[1]Rikshospitalet, Oslo, NORWAY, [2]University of Applied Sciences, Ulm, GERMANY

Background The aim of this study was to assess the accuracy of blood flow and cross-section indexes measured with transcranial Doppler (TCD) in vitro.
Methods The study was carried out using a closed-loop system with a roller pump Windkessel function to flatten small ripples in the flow. This contained heparinized whole blood with a hematocrit value of approx. 30%. Measurements were made by insonating silicone tubes of 2, 3 and 4 mm diameters and a wall thickness of 1 mm. Flow was changed in these tubes as follows: 320, 240, 150 and 320 ml/min. The tubes were insonated at an angle of 45°C with TCD instrumentation (DWL) using a 2 MH_Z probe, 10 mm sample volume, 59 mm depth and peak repetition frequency of 6 KH_Z. Frequency-weighted first moment calculations of Doppler power were made using specially designed software (BR02) and these arbitrary values were calibrated offset for 0 flow. Cross-section area indexes were calculated by dividing the flow indexes by the maximum velocities. Reference flow index values were measured to ensure that back-scattering from the circulating blood remained constant throughout the studies. This was carried out by insonating a rectangular Plexiglas tube (10x5x1 mm) throughout the studies with a fixed $2MH_Z$ probe and constant settings.

Results The relative flow index values showed a very good correlation with changes of the known flow values using the three different tube diameters: tube diameter 2 mm r (correlation coefficient)=0.994, p<0.01; 3 mm, r=0.999, p<0.01; 4 mm, r=0.999, p=0.001). The calculated cross-section index values for the 4 flow measurements varied for 2 mm diameter by a SD value of 0.85% for 3 mm diameter: 2.08%, and for 4 mm diameter: 2.53%.
Conclusion This in vitro study has shown that relative flow and cross-section indexes may be measured using TCD instrumentation. Methods to overcome beam distortion due to the temporal bone should now be developed so that this method may be adapted for in vivo transcranial use.

P 1028

Stroke in after war period

S. D. Miljkovic, M. J. Arbutina, V. Djajic, Z. Vujkovic
Clinical Center Banja Luka, Banja Luka, BOSNIA & HERZEGOVINA

Cerebrovascular diseases (CVD) belong to the group of leading massive chronic non-contagious diseases. They are one of the most common diseases of modern humans. They take third place by frequency and mortality, and first place by invalidity.
We were observing the frequency of stroke for the territory of Banja Luka in two time periods (two years before and two years after the war). In our study we included all the patients treated in Neurology Clinic Banja Luka in 1988, 1989, 1997 and 1998, and all necessary data were taken from their histories of disease. We included these data in an earlier made stroke register. The results prove that our beginning suppositions were correct. There is a significant increase of patient number and of incidence and prevalence of stroke patients in war and after war periods. In two years before the war there were 650 registered patients (1988–354, 1989–296), and in the period after the war there were 1098 patients (1997–558, 1998–540).
Conclusion In this region we noticed an increase of stroke patients in the after war period, and we proved it by patient analysis. It confirms that once appeared pathophysiologic process caused by stress doesn't stop with official end of crisis in some region, but it continues its existence. Once again it has proved a great significance of stress as a risk factor for CVD, in this region probably the most important risk factor beside the other "standard factors" such as hypertension, heart diseases, smoking etc.

P 1029

Secular mortality trends of cerebrovascular diseases in Croatia: 1958-1997

D. Kadojic[1], M. Kadojic[2], V. Babus[3]
[1]Department of Neurology, Clinical Hospital Osijek, Osijek, CROATIA, [2]Department of Physical Medicine and Rehabilitation, Osijek, CROATIA, [3]School of Public Health "Andrija Stampar", Faculty of Medicine, University of Zagreb, Zagreb, CROATIA

Neuroepidemiological studies of cerebrovascular diseases (CVD) are very important for correct programming and planning of health service and its specific organization. Especially significant are the studies that show secular changes in the mortality from a disease during a long period of years or decades. This research comprised all deaths from CVD in Croatia between 35 and 74 years of age over the period 1958–1997. The number of deaths from CVD for the investigated population in that period increased by 40%. At the same time, the rates standardized by age and sex increased by 62%. Proportional mortality rate from this disease increased from 7.1% in the year 1958 to 14.8% in 1997 (increase of 39.48%). The specific mortality rates over 5-year period have shown a trend of increase in all male age groups and stagnation or decrease in females. Standardized mortality rates for CVD in continental communities (Osijek, Varazdin) are much higher (twice or even threefold) than those in coastal communities (Split, Rijeka). A cohort data analysis has shown that although mortality trends of CVD stagnated or even declined in some communities during the recent years, the secular trend for the entire country had a tendency of constant rise over the whole period of research. Therefore, the short-term prognosis predicts further increase of both the number and rates of deaths from CVD in our country.

P 1030

Peculiarities of demographic characteristics, risk factors and the outcome of cerebral infarction (ci) in patients with diabetes mellitus (DM)

G. Enina, E. Miglane, B. Tilgale, E. Slosberga
Medical Academy of Latvia, Riga, LATVIA

Introduction The aim of the study was to ascertain the outcome of CI among patients with DM, taking into account the peculiarities of other risk factors and demographic characteristics.
Methods and patients Study was performed at the Neuroangiological Centre observing the data of 3013 patients, among them 530 (17.6%) patients had DM and 2483 patients were included in the control group. All the patients underwent CT and/or MR of the brain.
Results The location of CI did not differ in the two groups. 83.4% and 82.6% of CI were located in the carotid system, respectively. The size of magistral CI differed slightly in both groups: accordingly 71% and 69% of CI were of small or moderate size, but the proportion of lacunar CIs was more frequent among patients with DM, by 4%. The mortality in the patient group with DM only by 2% exceed the mortality in the control group and was equal to 25%, showing no significant difference depending on other risk factors as arterial hypertension and hypercholesterolemia. Inability to walk even with assistance was by 14.1% higher in the patient group with DM than in the control group and in 30.2% of cases disability corresponded to 4th and 5th degree of Rankin score. Arterial hypertension and hypercholesterolemia did not significantly influence the degree of disability in patients with DM.
Conclusions Mortality was only by 2% higher in the patient group with DM whereas significantly higher was the proportion of patients which need permanent care and attention.

P 1031

Relationship between mortality from spontaneous intracranial haemorrhages and the size, site, behaviour of the haemorrhage and the patients' age

R. Herzig[1], S. Burval[2], I. Vlachova[1], K. Urbanek[1], B. Krupka[1]
[1]Stroke Center, Clinic of Neurology, Faculty Hospital, Olomouc, CZECH REPUBLIC, [2]Clinic of Radiology, Faculty Hospital, Olomouc, CZECH REPUBLIC

Introduction Mortality from spontaneous intracranial haemorrhages (SICHs) is influenced by several factors. The objective of this retrospective study was to evaluate the relationship between the mortality from SICH and the size, site, behaviour of the haemorrhage, and the patients' age.

Methods The authors evaluated a group of 202 patients with SICHs, of which 137 haemorrhages were intracerebral (ICH), and 65 were subarachnoid/intraventricular (SAH/IVH) in localization. The site, the size (according to the longest axis) of the haemorrhage and the midline-shift were evaluated by computed tomography. The author investigated the relationship between 30-day mortality, the above-mentioned factors and the patients' age. Chi-square tests were applied for the testing of statistical significance.
Results The mortality from both ICH, and SAH/IVH increased significantly with the patients' age ($p=0.00002$ and $p=0.0009$ resp.). The mortality from supratentorial ICH both with, and without the IV component increased significantly in relation to the size of the haemorrhage ($p=0.05$ and $p=0.04$ resp.). The authors also provided evidence of a close correlation between the increase in mortality from SICH and the midline-shift ($p=0.00002$).
Conclusion The mortality from SICH increases significantly in relation to the patients' age and the midline-shift associated with the haemorrhage. The mortality from spontaneous supratentorial ICH increases significantly in relation to the size of the haemorrhage and intraventricular penetration of blood. The evaluation of the above factors can be used for prediction of the condition development of patients with those haemorrhages.

P 1032

Influence of stress coping and personality on the genesis of atherosclerosis

I. Anders[1], E. Esterbauer[1], G. Ladurner[1], U. Wranek[2]
[1]Christian Doppler Clinic, Salzburg, AUSTRIA, [2]University of Salzburg, Salzburg, AUSTRIA

Introduction Aim of this study was to investigate the influence of stress coping and personality on the expression of lipid values in regard to the genesis of atherosclerosis.
Method 756 high-risk patients participated at an interdisciplinary prevention program. A multiplicity of physiological and psychological risk factors concerning heart attack and stroke, including a stress coping questionnaire and a personality inventory, has been collected. Differences in coping and personality between groups with / without risk factors have been calculated by means of ANCOVA.
Results Men with elevated lipid values demonstrated higher scores in the coping styles situation control attempts, continued thoughts, minimising and lower values in tendency to flee. Women with elevated lipid values showed higher scores in downplaying, minimising and tendency to flee.
Men characterised by pathological HDL-C values demonstrated personality traits like performance orientation, aggression, lower satisfaction in life and less social orientation. Women with pathological LDL-C showed more neuroticism, excitement and health worries.
Discussion Pathological parameters in lipid metabolism seem to be in conjunction with repressive, passive coping styles and type A behaviour. A psychological stress induction, mediated by the named coping styles could be a co-producing agent of dyslipidemia and atherosclerosis by means of influence on the neuroendocrine response mechanism.

P 1033

Homocysteine as a risk factor in cerebrovascular dementia. Can it predict cognitive impairment?

A. M. Mouzak[1], P. Agathos[1], A. Alevra[2], G. Antonakos[2], A. Kaliontzoglou[1], T. Kostaras[1], E. Vogiatzakis[2], E. Vourdeli-Giannakoura[1]
[1]Polyclinic Hospital of Athens Department of Neurology, Athens, GREECE, [2]Polyclinic Hospital of Athens Department of Microbiology, Athens, GREECE

Introduction Homocysteine has been proven to be an independent risk factor for cerebrovascular disease. The objective of this study is to investigate whether homocysteine plasma levels are associated with cerebrovascular dementia; furthermore if these levels can predict cognitive impairment in the future.
Methods Three groups of patients (group A, B and C) age 60–87 years were selected to be studied for a period of one year. These consisted of: group A (24 patients) with cerebrovascular dementia, group B (24 patients) with stroke without cognitive dysfunction and group C (24 subjects) as control. Patients with renal failure, coronary heart disease and states accompanied by cobalamin or folic acid deficiency were excluded.
Homocysteine plasma levels were measured after twelve hours of fasting by immunoassay method (MICRO ELISA).
Cognitive status appraisal of all groups was carried out by the Mini Mental State Examination, clock test and Geriatric Depression Scale.
The Wilcoxon and Mann-Whitney U tests were used in statistical result analysis.
Results Homocysteine plasma levels were elevated in both groups (A and B) with cerebrovascular disease, significantly more so in the vascular dementia group. Concerning cognitive impairment the results indicate that higher homocysteine plasma levels are related to decline of cognitive functions.
Conclusions Homocysteine seems to be associated with cerebrovascular dementia and furthermore with the degree of cognitive dysfunction.

P 1034

Association of meteorological factors and season of the year with stroke incidence

V. Vargek Solter, M. Bosnar Puretic, L. Dezmalj Grbelja, H. Hecimovic, V. Supanc, V. Demarin
Neurology Department University Hospital "Sestre milosrdnice", Zagreb, CROATIA

Introduction Previous studies, also as every day clinical practice implicate that association of weather with stroke incidence exists. The aim of this study was to analyse the seasonal distribution of stroke and to correlate stroke incidence (ischemic (ISH), hemorrhagic (ICH) and subarachnoidal haemorrhage (SAH)) with changes in meteorological factors: outside temperature, air pressure and air humidity.
Methods We analysed the data of all stroke patients admitted to Neurology Department University Hospital "Sestre milosrdnice" from January 1st, 2001 till December 31st, 2001. Meteorological data for day before and day of incident were analysed.
Results This study involved 1059 stroke patients, 124 SAH, 845 ISH and 90 ICH. We observed significant increase of SAH during May, June and December. The highest incidence of ICH events was in November, July and August. ISH most frequently occurred during July, June and during January and March.

According to meteorological changes we observed the higher incidence of ISH during increase in air humidity (51.4%) and air pressure drop (38.2%). 52.5% of all ICH occurred also during air humidity increase and 40% during air pressure drop. Incidence of SAH was higher on days with air pressure and humidity drop (46.9% and 48.7%, respectively). All three stroke types were more frequent on days when rapid increase of outside temperature occurred.
Conclusions We observed that the incidence of all three strokes types is higher during summer and winter months when temperature excess is present. Significant correlation between air pressure drop and air humidity increase and stroke occurrence was found.

P 1035

The incidence and aetiology of intracerebral haemorrhage in adult population of central region from Republic of Moldova

L. Zaporojan, D. Manea, N. Boghean, A. Pruteanu, S. Groppa, E. Zota
National Practical Scientific Center of Emergency Medicine, Chisinau, REPUBLIC OF MOLDOVA

Background and purpose Intracerebral haemorrhage (ICH) accounts for 31% of all strokes in Moldova and is associated with high rates of mortality and disability. Goals were evaluation of etiologic factors in ICH patients hospitalised and treated in Stroke Unit in 2001.
Materials and methods A group of 150 ICH patients underwent clinical, CT, laboratory examinations.
Results ICH aetiological factors were: in 58% – hypertension (HT), in 17.3% – HT associated with atherosclerosis, in 4.66% – HT with heart diseases (valvulopathies, rheumatism, heart surgery), in 4.66% – HT with diabetes mellitus, in 4% – HT with alcoholism, in 3.33% – ruptured aneurysm, in 2% – HT with hepatic cirrhoses, and in 0.66% – cerebral vasculitis. We couldn't find a clear cause of ICH in 5.3%. Affected age groups were: >40 years – 5 patients, 41–50 years – 31; 51–60 years – 38; 61–70 years – 45; <70 years – 25 patients. Fatal outcome counted 48.88%: during first day – 25 cases, day II – 13, after day III – 29. Contributing factors were: volume and localization of ICH, ventricular and subarachnoidal eruption, age, GCS degree at hospital arrival, other conditions.
Conclusions ICH is a neurological emergency and needs specialised assistance, appropriate treatment and care approaches in first hours. The most frequent cause of ICH in Moldova is HT or HT associated with other pathologies. Most affected are adults of working age. High mortality and disability rate causes major economic prejudices. Adequate control of HT could be an effective preventive measure of ICH.

P 1036

Significance of clinically evident stroke in patients with cerebral white matter lesions

A. M. Pavlovic, N. Sternic, J. Zidverc-Trajkovic, Z. Jovanovic, D. M. Pavlovic, M. Mijajlovic
Institute of Neurology, Belgrade, YUGOSLAVIA

P 1037

A model for early prognosis of spontaneous intracerebral haemorrhage

V. Djajic[1], S. Miljkovic[1], Z. Vujkovic[2], M. Kovacevic[3], M. Arbutina[2], N. Petrovic[2], D. Racic[2]
[1]Clinical Center Banjaluka, Banjaluka, BOSNIA AND HERZEGOVINA, [2]Clinical Centre Banjaluka, Banjaluka, BOSNIA AND HERZEGOVINA, [3]Clinical Centre of Serbia, Belgrade, YUGOSLAVIA

P 1038

Intracranial haemorrhage - role of risk factors

R. R. Raicevic[1], L. Markovic[2], S. Petkovic[1], B. Antic[1]
[1]Military Medical Academy, Belgrade, YUGOSLAVIA, [2]Military medical Academy, Belgrade, YUGOSLAVIA

P 1039

Diagnostic problems in minor hemorrhagic stroke

D. Gherman, M. Gavriliuc
Scientific and Practical Center of Neurology and Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA

P 1040

Assessment of temporal bone beam distortion when using multifrequency Doppler to differentiate cerebral microemboli

D. Russell[1], R. Brucher[2]
[1]Rikshospitalet, Oslo, NORWAY, [2]University of Applied Sciences, Ulm, GERMANY

P 1041

Differences and similarities among patients with stroke depending on sex

M. Wiszniewska[1], A. Czlonkowska[2]
[1]Specjalistic Hospital, Pila, POLAND, [2]2nd Department of Neurology, Institute of Psychiatry &Neurology, Warsaw, POLAND

Neuromuscular disorders
Motor neurone diseases

P 1042

Biochemical markers of disease progression in sporadic amyotrophic lateral sclerosis

M. N. Zakharova[1], O. S. Brusov[2], I. A. Zavalishin[1]
[1]Institute of Neurology, Moscow, RUSSIAN FEDERATION, [2]Scientific Centre of Mental Disorders, Moscow, RUSSIAN FEDERATION

The main aim of our study was monitoring of indices of antioxidant activity in SALS patients. 28 patients (13 males, 15 females; mean age 58.5±12, 3 years; mean duration 25.9±5, 5 months) were monitored during 6 months. Every month the patients were examined neurologically, ALS functional rating scale, the pulmonary dysfunction by measurement of FVC, evaluated functional disability.

The indices of antioxidant activity included the measurement of activity of Cu/Zn SOD1, GSH-peroxidase, GSH-reductase, GSH-S-transferase, catalase and levels of SH-groups in erythrocytes of SALS patients.
All SALS patients were divided into subgroups with cervical (9 persons), lumbar (4) and bulbar onset (15) of disease. Two types of progression have been identified: with rapidly progressive course (16 patients) and slow ones (12 patients).
In the whole group the decline of ALSFRS score from 29.4±8, 0 points to 20.5±7, 6 points ($p<0.001$) and the mean FVC from 80.6±23, 8% of predicted to 61.2±11, 6% ($p<0.01$) of predicted, has been seen after 6 months. The monitoring of biochemical indices revealed the decrease of GSH-peroxidase activity from 3.84±1, 11 u/g Hb to 2.98±1, 59 u/g Hb ($p<0.01$) and the protein SH-groups' levels in erythrocytes from 1.15±0, 39 μM/g Hb to 0.55±0, 17 μM/g Hb ($p<0.005$). The significant increase of catalase activity has been seen (from 3.82±2, 79 u/g Hb to 7.27±1, 64 u/g Hb, $p<0.05$). The most significant decline of antioxidant activity and SH-groups levels has been revealed in bulbar form of ALS with rapidly progressive course.
The monitoring of antioxidant activity and thiols may be specific method of evaluation of disease progression in ALS.

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Oesophageal manometry in amyotrophic lateral sclerosis patients, with dysphagia

B. Tomik[1], A. Szczudlik[1], K. Lorens[2], S. J. Konturek[2], A. Pichor[1]
[1]Department of Neurology CMUJ, Cracow, POLAND, [2]Institute of Physiology CMUJ, Cracow, POLAND

Background There are only few techniques currently available to assess reliably the stages of swallowing dysfunction due to ALS. The occurrence of the oropharyngeal phases of swallowing in ALS patients has been well documented. We suggest a method to detect the oesophageal disturbances due to dysphagia in ALS patients.
Objective To evaluate the use of oesophageal manometry in detecting the oesophageal phase of dysphagia in ALS patients.
Material and methods The study was carried out in 20 bulbar onset ALS patients with clinical dysphagia, fulfilling WFN criteria and 20 sex- and age- matched healthy volunteers. The standard transnasal oesophageal manometry was performed in all subjects using a flexible catheter with the solid-state transducers (Synectics, Sweden). 10 to 15 – 5 ml fluid (water) or solid piece of food (sandwich) were swallowed at 30 sec. intervals.
Results The comparison of median upper oesophageal contractile amplitude, upper oesophageal contractile duration and upper oesophageal contractile velocity during the swallowing of fluid between ALS and controls subjects were 99*58 vs. 60*22 mm Hg ($p=0.009$), 3.91*1.4 vs. 2.7*0.7 sec ($p=0.001$), 4.6*1.8 vs. 2.8*0.4 cm/sec ($p<0.001$) and during the swallowing of solid food were 96±59 vs. 44±25 mm Hg ($p<0.001$), 4.8±1.9 vs. 2.5±1.7 sec ($p<0.001$), 5.4±2.0 vs. 3.9±0.5 cm/sec ($p=0.002$).
Conclusion We conclude that ALS patients showed significant abnormalities in all parameters measured by oesophageal manometry as compared to controls. We also demonstrated the existence of disturbances in the oesophageal phase of swallowing in ALS patients with dysphagia that hasn't been carefully investigated previously.

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A9V signal sequence dimorphism of MnSOD gene and the progression rate in Russian ALS patients

G. N. Levitsky[1], P. A. Slominsky[2], N. I. Levitskaya[1], A. I. Lysko[3], E. A. Kondratyeva[2], S. A. Limborska[2], V. I. Skvortsova[1]
[1]Russian State Medical University, Moscow, RUSSIAN FEDERATION, [2]Institute of Molecular Genetics, Moscow, RUSSIAN FEDERATION, [3]Institute of Pharmacology, Moscow, RUSSIAN FEDERATION

Introduction Homozygous A9V genotypes of MnSOD gene were suggested to be significant risk factors for sporadic ALS. We elucidated the role of MnSOD A9V dimorphism and its relation to oxidant stress in Russian ALS patients.
Methods Blood and CSF samples were taken from 45 sporadic ALS patients and 50 healthy individuals. The patients were assessed by Norris ALS score, each 6 months. The progression rate was determined for the period not less then a year since the onset. All samples were screened for MnSOD A9V alleles by PCR and double strand conformation polymorphism. MDA contents in serum and CSF were determined by spectrophotometry.
Results We found 23.5% and 27.5% of ALS patients homozygous for A9 and V9 alleles, respectively, 49% were heterozygous. There were no differences between frequencies of A9V alleles in patients and controls. Patients with slow, moderate and rapid progression comprised 55.6%, 26.6% and 17.8%, respectively, and lost 0–4, 5–9 and more than 10 degrees each 6 months ($r=-0.96-0.98$; $p<0.0001$). Slow progression was encountered with lower frequency in heterozygous, then in V9 ($p=0.035$), but not then in A9 homozygous patients. We found no difference between age or site of onset and MDA contents in serum or CSF in relation to A9V allelic variances in the studied cohort.
Conclusion The heterozygous genotype of A9V MnSOD may unfavourably influence ALS course not being a risk factor for the disease itself possibly due to population heterogeneity. Such conformity may be unrelated to antioxidant properties of the enzyme.

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Cognitive impairment and SPECT findings in amyotrophic lateral sclerosis

A. Valenza[1], C. Marra[1], M. Calcagni[2], A. Giordano[2], G. De Rossi[2], G. Lippi[1], M. Sabatelli[1], G. Gainotti[1]
[1]Institute of Neurology, Catholic University, Rome, ITALY, [2]Institute of Nuclear Medicine, Catholic University, Rome, ITALY

Introduction Amyotrophic lateral sclerosis (ALS) is frequently associated to dementia. The nature of this dementia and the clinical determinants of its development remain still unclear.
Methods: Seventeen ALS pts, 15 AD pts. and 12 control subjects (CS), matched for sex, age and educational level underwent an extensive neuropsychological test battery and a brain perfusion SPET with 740 MBq of 99mTc-HMPAO. ALS patients were classified on the basis of the prevalence of motoneuron disease (first, second or both) and bulbar involvement. According to DSM IV, criteria ALS were dived in two groups: without dementia (ALS-ND n=9) and with dementia (ALS-D n=8).
Results Both ALS-D and ALS-ND showed hypo-perfusion in pons region ($p<.05$) when compared with CS. ALS-D showed a selective hypoperfusion ($p<.01$ vs. CS and ALS-ND) in fronto-temporal and bilateral basal ganglia regions similar to AD

group. AD showed a severe hypoperfusion in all associative and frontal areas but differ from ALS-D only in parietal bilateral areas. ALS-D scored worse than CS and ALS-ND in most of neuropsychological tests but they were severely impaired in verbal fluency tasks and all frontal tasks (p<. 01). A non-parametric comparison showed that dementia is more frequent among ASL pts. with second motoneuron and/or bulbar involvement.
Conclusion Our results suggest that dementia in ALS is more similar to fronto temporal dementia than to AD. The prevalence of dementia among ALS patients with second motoneuron and bulbar involvement is strictly in accordance with SPET results.

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Individual variation in amyotrophic lateral sclerosis with dementia: Clinical assessment and literature review.

Y. Oyama[1], A. Kurihara[1], H. Takada[2]
[1]Department of Neurology, Aomori-Rosai Hospital, Aomori-Ken, JAPAN, [2]Department of Neurology, Iwaki National Hospital, Iwaki, JAPAN

Clinical features of amyotrophic lateral sclerosis (ALS), patients with the condition of mental disturbance and dementia, seen at our hospitals between 1997 and 2001, were reviewed and compared with those in Japanese literatures. Eleven percent of ALS patients (four out of thirty-five) had this mental condition. In ALS with this condition, the mean age at onset of motor neuron signs was 59 years, and the specific initial neurological feature was bulbar palsy. Common initial mental conditions were deterioration of spontaneity and depressive state. Forced crying was seen in two. The delays to the manifestation of the mental condition since onset of motor neuron signs were varied from four months to twenty-four months (the mean, 17 months). The mean duration of neurological symptoms to fatal respiratory failure was 24 months (range, 16 to 36 months). The delays for the mental condition in our two patients (24, 24 months) were markedly prolonged compared to those in the previous reports (mean; 11 months, range; 4 to 18 months), whereas no difference was found between our patients and those in the literatures for age at onset of motor neuron signs, features of initial symptoms and characters of mental conditions. The degree of brain atrophy in MRI or CT showed no relation to the duration of neurological symptoms. The progress of radiological findings similarly had no connection with the course of the mental condition. Our results suggest that the delay to appearance of mental disturbance is widely varied individually in ALS patients with this condition.

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Sleep in amyotrophic lateral sclerosis: architecture, respiration, periodic leg movements and fasciculation

K. Sonka, E. Horvath, J. Fiksa, J. Sussova
Charles University, Prague 2, CZECH REPUBLIC

Introduction Amyotrophic lateral sclerosis (ALS) is a progressive disease characterised by the reduction of central and peripheral motor neurons. The involvement of respiratory muscles and the partial movement disability are suggested to be the reason of sleep disturbances in ALS.
Methods Night polysomnography was performed in 18 non-selected inpatients suffering from ALS (11 men, 7 women), aged 57.9 ±SD=6.7 years, with disease duration 1.8 ±0.6 years and Norris score 67.2 ±18.0 and in 10 healthy men and 6 women (age 57.8 +6.1).
Results Total sleep time: 301.9±39.7 min (control group: 352.2±71.8). Sleep latency: 19.8±4.5 min (21.2±19.1). REM sleep latency: 123.4±83.0 min (92.8±65.4). 3+4 NREM duration: 12.9±8.3% (9.1±5.3). REM duration: 12.7±6.0% (19.1±8.6). Wake duration: 22.1±9.2% (13.6±10.8). Number of arousal 1 min. and longer: 16.1±8.7 (12.7±7.2). Number of sleep cycles: 1.8±1.2 (2.9±1.5). Apnoe/hypopnoe index (AHI): 7.9±10.5 (12.1±13.6). REM sleep AHI: 16.4 ±19.8 (12.4±14.2). Periodic leg movements in sleep were present in 50% (37.5) of subjects. The number of muscle fasciculation per 1 min counted from the superficial electrode on both tibialis anterior muscles: Wake – 2.53 (0.1), 1NREM – 2.7 (0.4), 2NREM – 3.8 (0.2), 3+4 NREM – 3.1 (0.1) and REM sleep – 3.2 (0.2).
Conclusion Sleep of patients suffering from ALS was disturbed but surprisingly most of sleep parameters didn't differ from those of the control subjects. There was no relationship between the number of muscle fasciculation and sleep stages.
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Monoclonal antibodies (CD95) in cases of lateral amyotrophic sclerosis

M. M. Gerasimova, T. M. Botvinko
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Lateral amyotrophic sclerosis (LAS) is a chronic progressive disease of the nervous system with selective affection of central and peripheral motor neurons (MN). The pathology has a neurodegenerative character. However, the role of the autoimmune process in LAS pathogenesis is nowadays widely discussed. CD95 are cytotoxic lymphocytes expressing the marker of readiness for apoptosis. Development of cytokine cascade is accompanied by influx of lymphocyte cells in the zone of brain tissue lesion and expression of leukocyte adhesive complex. All this induces FAS-receptors, which are in their turn, a CD95 marker leading to hyperexpression under conditions of apoptosis of neurons. The aim of this study was to prove participation of monoclonal antibodies (CD95) in apoptosis in cases of LAS. 8 patients (5 men and 3 women) ages from 54 up to 74 were examined, mean age – 63.2 years. In all cases CD95 level in peripheral blood was determined by the immunofluorescence method. The following LAS clinical forms were discovered: progressive bulbar paralysis (1), cervical debut of pathology (8), lumbar debut (3). Irrespective of LAS clinical forms, all cases showed high CD95 level. Mean CD95 level was 16.5±1.4% while the control group had 0–1%. The difference between the main and control groups are proved to be reliable: the higher the level of MN affection, the higher CD95 concentration. Thus, the received data may be evidence of involving CD95 in brainstem and spinal cord MN apoptosis, in cases of LAS.

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Electrophysiological correlates of selective attention in patients with amyotrophic lateral sclerosis (ALS)

E. H. Pinkhardt[1], R. Jürgens[1], M. Graf[1], D. Ecker[1], J. Born[2], W. Becker[1], A. C. Ludolph[1], H. Schreiber[1]
[1]Neurologische Universitätsklinik Ulm, Ulm, GERMANY, [2]Universität zu Lübeck, Lübeck, GERMANY

There is experimental evidence for a functional contribution of the prefrontal cortex to clinical deficits caused by the neurodegenerative process in ALS. Since tasks of selective attention are subjected to the functional control of the frontal lobe, we have assessed electrophysiological and psychometric correlates specifically associated with this kind of attention.
Methods The patient group consisted of 20 subjects (15 male, 5 female; mean age 58.5 years), the control group consisted of

20 individuals (mean age 57.2 years) age- and sex-matched to the patients. Clinical and psychometric assessment included the following tests: ALS score (Caroscio), spasticity scale (Ashworth), MWTB, Beck's depression inventory (BDI), TAP, Stroop test, word-fluency, design fluency (5-point Test). Event-related potentials (ERP) were recorded in a selective attention paradigm close to Hillyard. Analysis of ERP components included: negative difference (Nd) wave, N1-component, mismatch negativity (MMN) and P3 component.

Results Concerning the Nd wave, there was a significant decrease in the patient group as compared to controls. In several patients, there was even observed a complete loss of Nd. Parietal P3 amplitude, following task-relevant stimuli (targets) was distinctly expressed within both groups, whereas P3 to rare unattended stimuli (deviants) showed a clear predominance in the patient group.

MMN amplitude was equally expressed in both groups.

Conclusion: The results indicate an impairment of selective attentional capabilities and probably even a complementary increase of automatic and controlled processing of irrelevant information in ALS patients. This may be an expression of prefrontal dysfunction within these patients.

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Ultrasonic evaluation of carotid atherosclerosis in myotonic dystrophy

S. Kon, H. Tanaka, H. Takada
Iwaki National Hospital, Aomori, JAPAN

Ultrasonography provides real-time information about lumen and vessel wall irregularities of arteries. Several studies assessing carotid atherosclerosis with ultrasonography have been carried out in both healthy and diseased subjects such as cerebrovascular disease. Patients with myotonic dystrophy have various risk factors for atherosclerosis including diabetes mellitus, coagulation abnormality, obesity and insulin resistance. We, therefore, investigated the prevalence of carotid atherosclerosis and its association with risk factors in 28 myotonic dystrophy patients, without history of cerebrovascular disease. High-resolution B-mode ultrasonography was performed to determine the extent of atherosclerosis of extracranial carotid artery. The thickness of the intima-media complex (IMC) was measured as the distance between the lumen-intima interface and the media-adventitia interface. Atherosclerotic lesions were defined as plaques when the thickness of IMC was >1.0mm. Correlations between the thickness of IMC and risk factors for atherosclerosis (age, sex, smoking, hypertension, hyperlipidemia, visceral fat obesity and insulin resistance) were analysed, and then, correlations between existence of atherosclerotic lesions on ultrasonography and risk factors also studied. There was a significant positive linear correlation between the thickness of IMC and age in all patients. Patients with glucose intolerance had significant larger thickness of IMC than those without. Seven (25%) out of 28 patients had identified atherosclerotic lesions. Only age was an independent risk factor, whereas the other risk factors revealed no association with existence of lesions on ultrasonography. In conclusion, although myotonic dystrophy patients have several risk factors for atherosclerosis, age is the only predictor for the development of atherosclerotic lesion on ultrasonography.

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The spectrum of limb-girdle muscular dystrophy in Slovenia defined by molecular genetic analysis

J. Zidar[1], M. Meznaric-Petrusa[2], N. Zupancic[3], M. Fanin[4], C. Angelini[4], G. Piluso[5], V. Ventriglia[5], L. Politano[6]
[1]University Medical Centre, Institute of Clinical Neurophysiology, Ljubljana, SLOVENIA, [2]University of Ljubljana, Institute of Anatomy, Ljubljana, SLOVENIA, [3]University Medical Centre, Paediatric Hospital, Ljubljana, SLOVENIA, [4]University of Padova, Department of Neurology, Padova, ITALY, [5]Second University of Naples, Department of General Pathology, Naples, ITALY, [6]Second University of Naples, Dept of Clinical and Experimental Medicine, Naples, ITALY

Objective To define the frequency of sarcoglycanopathy, dysferlinopathy and calpainopathy in Slovenia.

Methods Twenty-two out of 56 limb-girdle muscular dystrophy (LGMD) patients, with the exclusion of those with dystrophinopathy, agreed to participate. The diagnosis of LGMD was based on the distribution of muscle weakness, serum CK values, EMG, and muscle biopsy. The dystrophin, sarcoglycans, dysferlin and calpain were demonstrated immunohistochemically and/or by Western blotting. Calpain gene and dysferlin gene were investigated by molecular genetic techniques.

Results Calpain was completely absent in 9 patients (4 female and 5 male, included 2 pairs of brothers and sisters). Mutations in the calpain gene were detected in 6. In one patient, no mutation in calpain gene could be detected, while in 2 the genetic analysis is in progress. Reduction of sarcolemma immunoreactivity against alpha-, beta-, gamma- and delta-sarcoglycan was observed in another 4 patients (in one female patient and her nephew and in 2 sporadic female patients). Abnormalities of dysferlin were detected in 2 sporadic patients. The male patient with no dysferlin and 50% reduction of calpain had Miyoshi myopathy. In him, no mutation in the dysferlin gene could be detected. The female patient with 85% reduction of dysferlin had typical LGMD. Dystrophin was normal by both immunohistochemistry, as well as by its molecular weight in all 22 cases.

Conclusions Calpainopathy is a common cause of LGMD in Slovenia, comprising approximately 40% of all LGMD cases, while sarcoglycanopathies and dysferlinopathies, detected in 4 and 2 patients respectively, seem to be relatively rare.

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The glucocorticoid receptor N363S polymorphism and steroid response in Duchenne dystrophy

D. M. Bonifati[1], S. F. Witchel[2], E. P. Hoffman[3], C. Angelini[1], E. Pegoraro[1]
[1]University of Padua, Neurosciences Dpt., Padua, ITALY, [2]Children's Hospital of Pittsburgh, Division of Paediatric Endocrinology, Pittsburgh, PA, USA, [3]Center for Genetic Medicine, Children's Research Hospital, Washington, DC, USA

Introduction Steroid administration is beneficial in Duchenne muscular dystrophy (DMD), however variable response and variable incidence and severity of side effects occur. The variables that play a role in determining steroid response in DMD have not so far been reported.

Methods Forty eight DMD patients, either prednisone or deflazacort treated, were screened by PCR/SSCP/direct sequencing of the entire glucocorticoid receptor (GRL) gene to verify if mutations in the GRL gene may be associated with a better or worse response to steroid.

Results Mutation studies revealed an heterozygous A to G mutation at GRL cDNA position 1220 in three DMD patients resulting in an asparagine to serine amino acid change at amino acid position 363 (N363S). Frequency of the N363S polymorphism was about 6% in our patient population. The N363S carriers DMD patients did not show any difference in short term evaluation of muscle strength and functional performances in comparison with the GRL non-carrier patients. However, when long-term effect of the N363S polymorphism was considered, the carriers' patients showed a trend towards a later age of loss of ambulation. In terms of steroid side effects, stomach discomfort was higher in the N363S non-carrier DMD patients than in the N363S carriers.
Conclusions Our data suggest that the N363S GRL polymorphism may be implicated in the long-term response to glucocorticoids. However, it is also evident that mechanisms other than the GRL polymorphisms are involved in clinical response to steroid in DMD.

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Short and long-term follow-up in a cohort of 48 DMD patients treated with corticosteroids.

D. M. Bonifati, G. Ruzza, E. Pegoraro, C. Angelini
University of Padua, Neurosciences Dpt., Padua, ITALY

Introduction Steroid administration may be beneficial in Duchenne muscular dystrophy (DMD) but issues such as duration, age at starting therapy, and the extent of side effects are unclear.
Methods We analysed retrospectively the disease progression in 48 DMD patients who had been treated with prednisone or deflazacort as part of previous double-blind trials. Clinical data included functional scores, MRC score, and monitoring of side effects.
Results The mean change in functional score at 12 months was –7.4% (SD 22.3, n=48), with values ranging from –55% to +50%. Half of the patients showed improvement (negative scores). There was a significant correlation between functional score and age at onset of treatment ($r2=0.4$; $p<0.001$) with younger patients tending to improve and older patients tending to deteriorate. All treated patients showed Cushingoid appearance, increased appetite, and hirsutism during therapy but none dropped out. Fractures were not more frequent than in the untreated patients.
Conclusions Our data suggest a better response to steroid treatment when started early. Side effects should not preclude therapy.

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Long-term treatment of steroid-resistant myasthenia gravis with FK506 (Tacrolimus)

T. Konishi[1], Y. Yoshiyama[2], M. Takamori[3], E. Mukai[4], G. Sobue[5], F. Kanda[6], J. Kira[7], T. Nakamura[8], T. Saida[1]
[1]Utano National Hospital, Kyoto, JAPAN, [2]Chiba University, Chiba, JAPAN, [3]Kanazawa University, Kanazawa, JAPAN, [4]National Nagoya Hospital, Nagoya, JAPAN, [5]Nagoya University, Nagoya, JAPAN, [6]Kobe University, Kobe, JAPAN, [7]Kyushu University, Fukuoka, JAPAN, [8]Nagasaki University, Nagasaki, JAPAN

Introduction We evaluated the efficacy and safety of long-term treatment with FK506 (Tacrolimus), an immunosuppressant, in patients with steroid-resistant myasthenia gravis (MG).
Methods We treated 12 patients (3 males and 9 females, 28–59 years old; mean, 47.3 years old) with steroid-resistant generalized MG. All patients underwent thy(mo)mectomy (4 cases of thymoma) more than 2 years (range: 2.9–27.3) before the study and had been treated with steroids (27.7+/–16.1 mg/2 days, range: 10–70). FK506 (2–4.5 mg/day) was orally administered for at least 20 months (range: 20–24). During this period, clinical signs, MG scores (max, 27 points), activities of daily living (0 to 6 ADL) and adverse effects were evaluated monthly in the first year of treatment, and every 2 months thereafter.
Results All patients completed treatment. Total MG score was significantly decreased at the end of the study (median: from 6.0 to 2.5, $p<0.05$). ADL score was improved in 6 patients. Titers of anti-AChR antibody were significantly reduced from 21.1+/–22.1 nM to 13.6+/–18.2 nM ($p<0.001$). Steroid dosage was reduced during the study in 6 of 12 patients, from 33.3+/–19.9 mg/2 days to 21.3+/–11.0 mg/2 days. One patient suffered from severe headache and eye pain, but these symptoms disappeared when the dose of FK506 was reduced. Other side effects were mild.
Conclusions FK506 would be effective and safe for long-term treatment in patients with steroid-resistant generalized MG.

P 1055

Experience on methotrexate (MTX) as an immunosuppressive drug in myasthenia gravis:

S. Urbanits[1], B. Hess[1], V. Nussgruber[1], S. Oberndorfer[1], H. Lahrmann[1], U. Zifko[2], W. Grisold[1]
[1]Dept of Neurology and LBI of NeuroOncology, Kaiser Franz Josef Hospital, Vienna, AUSTRIA, [2]Neurological Rehabilitation Centre, Clinic Bad Pirawarth, Bad Pirawarth, AUSTRIA

Introduction MTX is a folate antimetabolite inhibiting dihydrofolate reductase and DNA-synthesis. Besides its implementation as a chemotherapeutic agent, it is increasingly used in autoimmune and neuromuscular autoimmune diseases. The advantage is a relatively short onset of action (1–3 months), which may reduce additional steroid treatment. The average dose for this indication is 10–20 mg/week, which also causes only few haematological side effects. Patients with restriction of pulmonary function have to be excluded.
We report 5 patients with myasthenia, benefiting from MTX medication.
Materials and methods Five patients with autoimmune myasthenia gravis were observed in our neuromuscular clinic. Electrophysiological testing, antibody testing and edrophonium testing established diagnosis. Patients received MTX between 12 month and 36 months (median 24 months), either in combination therapy or as monotherapy. MTX was given orally once a week with doses between 7.5 and 15 mg.
A complete laboratory screen and pulmonary function test was obligatory before inclusion.
Results Three of five patients with myasthenia gravis responded to MTX, steroids could be tapered or stopped. We observed no haematological side effects and no pulmonary dysfunction. However, some patients reported dizziness, nausea and fatigue after weekly ingestion of tablets.
Conclusion Our clinical observations suggest that MTX is either a treatment of choice or an interesting alternative for immunosuppression in myasthenia patients. Myasthenia patients seem to profit well with this immunosuppression. As MTX is an inexpensive drug, its implementation into immunosuppression of myasthenia patients helps to run a cost effective patient management.

P 1056

Deliveries among women affected by myasthenia gravis in Norway 1967-1998

J. Midelfart Hoff[1], A. K. Daltveit[2], N. E. Gilhus[1]
[1]Department of Neurology, Haukeland University Hospital, Bergen, NORWAY, [2]The Medical Birth Registry of Norway, University of Bergen, Bergen, NORWAY

Introduction Myasthenia gravis (MG) affects women frequently in their childbearing years. The knowledge of the potential effect a pre-existing MG can have upon pregnancy and delivery is however yet limited.
Methods The Medical Birth Registry of Norway was established in 1967. It is based on the compulsory notification of all births after 16 weeks of gestation. We analysed data for all births in Norway from 1967–1998. The total number of deliveries was 1847493. 116 deliveries were by women diagnosed with MG.
Results In 20 (17.2%) of the 116 births, it was necessary to induce the delivery, mainly done by giving oxytocin as an infusion (9.5%). Caesarean section was performed in 20 (17.2%) births, in 13 cases after the beginning of labour. Complications during delivery were notified in 46 (39.7%) births.
Conclusion Female patients suffering from MG have reported complicated deliveries, relating this to their muscular weakness. It has also been claimed that in these cases caesarean section is often performed. Our next step will therefore be to compare the results obtained for the MG-group from The Medical Birth Registry to a normal material, to see if there is any trend. If this tends to be the case, one must discuss whether this should influence clinical practice.

P 1057

Myasthenia gravis, thymomas and associated neurological autoimmune diseases

P. Spalek, M. Soskova, F. Cibulcik, M. Schnorrer
Centre for Neuromuscular Diseases, Department of Neurology, Univ. Hospital Ruzinov, Bratislava, SLOVAKIA

Background 927 myasthenia gravis (MG) patients are regis-tered in the Slovak Centre for Neuromuscular Diseases (Dec. 31, 2001).
Objectives and results Thymoma was diagnosed in 113 patients (12.3%). In 139 MG patients (l4.9%) l52 associated autoimmune diseases were diagnosed, mostly autoimmune thyroid disorders, rheumatoid arthritis, haematological disorders, and skin diseases. The autoimmune neurological diseases associated with thymoma and MG was diagnosed in 6 patients: I. Acute polymyositis (PM) combined with fulminant MG, in two cases with malign thymoma, were confirmed in 3 patients. In 2 patients, an association of MG and chronic PM were diagnosed. One patient died. II. We diagnosed LEMS in MG patient with malign thymoma, who later developed small cell lung carcinoma. III. Clinical and EMG signs of neuromyotonia, neuropathy and limbic like encephalitis developed in a patient with thymoma. Plasmapheresis, prednisone, azathioprine and thymectomy resulted in remission.
Conclusion Thymomas are associated with certain neurological autoimmune diseases with defined autoantigenes and pathogenetic relevance of autoantibodies or auto destructive T cells (myasthenia gravis in 12–30% of thymomas, other diseases are rare in thymomas: LEMS, stiff maN syndrome, neuromyotonia, peripheral neuropathy, intestinal pseudo-obstruction, limbic encephalitis). The autoantigens in PM remains unknown, however immunosuppressive combined therapy and thymectomy resulted mostly in remission, only one patient died.

P 1058

Acute polymyositis and elevated anti-acetylcholine receptor antibodies (ACHR-AB) in a patient with thymoma associated with Hashimoto's thyroiditis and suspected autoimmune myelosupression, another case of multiple autoimmune phenomena.

B. Hess[1], S. Urbanits[1], J. Wanschitz[2], W. Grisold[1], S. Gräser Lang[3], A. Jelen[4]
[1]Dept. of Neurology and LBI of NeuroOncology, Kaiser Franz Josef Hospital, Vienna, AUSTRIA, [2]Clinical Dept. of Neurology, Dept. of Neuropathology, University Hospital Vienna, Vienna, AUSTRIA, [3]Dept. of Neurology, Hanusch Hospital, Vienna, AUSTRIA, [4]Dept. of Pathology, Hanusch Hospital, Vienna, AUSTRIA

Introduction Patients with thymoma tend to harbour autoimmune diseases. A case report with biopsy proven polymyositis (PM), a striking elevation of ACHR-AB and a haematological autoimmune association with anaemia, leukopenia and thrombocytopenia and Hashimoto's thyreoiditis will be presented.
Case report A 65 years old woman developed progressive generalised muscle weakness without diurnal variations over two weeks. Clinically neck flexor muscles and proximal upper extremity were predominately affected. There was no overt ocular or bulbar involvement. Laboratory investigations revealed normal serum creatine kinase (CK) values, ACHR-AB in serum were elevated (127 nmol/l); additionally she had anaemia, leucopenia and thrombocytopenia. Edrophonium test was inconclusive.
Repeated repetitive nerve stimulation did not show a decrement. EMG of several muscles was pathologic myopathic with spontaneous activity. Open muscle biopsy of the gastrognemius muscle showed a myositic pattern with inflammatory infiltrates including T-cells attacking muscle fibers and up regulation of HLA I in some muscle fiber membranes.
Due to this diagnosis, steroid treatment was initiated (25 mg prednisolone/day). Unexpectedly several days later, she aspirated and died.
Autopsy diagnosed a malignant thymoma I (Müller-Hermelink) and a Hashimoto's thyroiditis. Bone marrow revealed aplastic anaemia.
Muscle pathology in deltoid and vastus lateralis muscle confirmed polymyositis. Heart muscle showed myositic changes suggesting cardiac involvement in PM.
Discussion and conclusion Our case report describes a thymoma patient with an unexpected association of several distinct autoimmune diseases. Unusual features are the lacking elevated serum CK, cardiac involvement and association with multiple autoimmune diseases. The diagnostic relevance of elevated serum ACHR-AB remains unclear.

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The role of autoimmune lesions in mechanism of apoptosis in lateral amyotrophic sclerosis (LAS)

M. M. Gerasimova, T. M. Botvinko
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Lateral amyotrophic sclerosis (LAS) is chronic progressive disease of neural system with selective affection of central and peripheral motor neurons. The presence of autoimmune compo-

nent in pathogenesis of LAS is now widely discussed. One of the ways of neuron's death is apoptosis, which results in fragmentation of DNA, creating antigen-antibody complexes. Nucleosomes, which released during apoptosis, activate immune system that causes creating of anti-DNA. SD95 – are cytotoxic lymphocytes, which express preparedness to apoptosis.
The aim of this study was to demonstrate participation of monoclonal antibodies (SD95) and anti-DNA. 12 patients (8 male and 4 female) ages from 54 up to 74 years (mean age – 63.2) were investigated. Level of anti-DNA and of SD95 was determined in blood serum. Clinically were found following patterns of LAS: Progressive bulbar paralysis with prevalence of pyramidal signs (1), cervical debut of disease (8), lumbar debut (3). All the patients showed increased level of SD95. Mean value of APO1-Fas-receptors was 16.5±1, 4%. Determining of anti-DNA level in blood showed its reliable increase ($p<0.001$) in comparison with control group (0.196±0, 01 UOD). Level of anti-DNA in investigated patients varied from 0.343±0, 02 UOD to 0.609±0, 02 UOD. Correlation between anti-DNA and SD95 was observed. The higher level of affection of motor neurons, the greater concentration of SD95 and anti-DNA (K=+0.8).
Therefore, obtained data can be evidence of involving of SD95 in apoptosis of motor neurons of brainstem in LAS. One of the causes of anti-DNA production is activation of immune system by nucleosomes revealed during cellular apoptosis.

P 1060

Interferon status of myasthenic patients

S. Kotov[1], O. Sidorova[1], V. Neretin[1], B. Agafonov[1], A. Kildushevsky[1], O. Moskalets[1], B. Geht[2], T. Ospelnikova[3]
[1]Moscow Regional Research Clinical Institute (MONIKI), Moscow, RUSSIAN FEDERATION, [2]Scientific Research Institute of General Pathology and Pathologic Physiology of RAMS, Moscow, RUSSIAN FEDERATION, [3]N.F.Gamalei Institute of Epidemiology and Microbiology, Moscow, RUSSIAN FEDERATION

Introduction Interferon status of myasthenic patients, in addition to the level of antibodies to acetylcholine receptors, include some other changes, for example, those of interleukin production. In medical literature, there is some information about non-identical effect of a-IFN administration.
Methods The object of the present study was investigation of interferon status of myasthenic patients. The total of 12 patients with generalized myasthenia aged 23 – 65 was studied. The indices of interferon status were measured in entire heparinized blood using S.S.Grigoryan's and some other micromethods (1988). The following interferon status indices were studied: serum IFN, titers of a-IFN, g-IFN and spontaneous IFN.
Results The results obtained revealed that the level of serum IFN in the majority of patients didn't differ from the control data (<2–8 un/ml). In 4 cases, it formed 8 and 8–16 un/ml. The level of a–IFN decreased in 92% of patients (11) and in 1 case it didn't differ from the normal values (640–1280 un/ml). The level of γ-IFN decreased in all myasthenic patients (4–64 un/ml in patients, 128–250 un/ml in the control). Spontaneous IFN in 10 patients (83%) didn't differ from the control values (<2 un/ml). In 2 cases, it formed 2–4 un/ml.
Conclusion The studied adult patients with generalized myasthenia showed a-IFN and γ-IFN deficiency.

P 1061

Antylympholin-Gt in treatment of children with myasthenia

O. Sidorova[1], V. Neretin[1], V. Tsuman[1], S. Kotov[1], A. Nalivkin[1], B. Agafonov[1], B. Geht[2], L. Serova[3], V. Golubeva[3], T. Ivanenko[3]
[1]Moscow Regional Research Clinical Institute (MONIKI), Moscow, RUSSIAN FEDERATION, [2]Research Institute of Normal and Pathologic Physiology of RAMS, Moscow, RUSSIAN FEDERATION, [3]Research Institute of Gerontology of RF Ministry of Health, Moscow, RUSSIAN FEDERATION

The **object** of the study: investigation of goat antilympholin (antilympholin-Gt) in patients with juvenile myasthenia.
Methods The total of myasthenia children observed was 14. A single preparation dose was 1.2–1.5 mg/kg of body weight. It was administered intravenously using 3–5 dropped injections. The values of humor and cellular immunity were determined.
Results Positive clinical effect was noticed in 8 of 12 cases of generalized form of disease (63%) as well as in patients with ophthalmic form of the disease. The level of both general and active lymphocytes of peripheral blood increased (mean values). Immunoglobulin level did not significantly change. Patients with immunoglobulin level decreased after treatment with antilympholin-Gt, showed complete restoration of moving activity.
Conclusion Thus, antilympholin-Gt in the dose 1.2–1.5 mg/kg of body weight may influence patients with juvenile myasthenia as both immunostimulating and immunosupressing agent. In cases with it acted as immunosupressor, the patient's demonstrated clinical improvement and even remission. In cases when it acted as immunostimulator, there was none of the clinical improvement. It is known that antilympholine-Gt acts as immunostimulator in low doses (0.5 mg/kg). Taking into account differently directed immunomodulating effect of the selected dose (1.2–1.5 mg/kg), the greater doses of antilympholin-Gt (5mg/kg) should be recommended for patients with juvenile myasthenia.

P 1062

Myasthenia gravis, pregnancy and transient neonatal myasthenia

P. Spalek, M. Soskova, M. Oros, V. Obtrubova
Centre for Neuromuscular Diseases, Department of Neurology, Univ. Hospital Ruzinov, Bratislava, SLOVAKIA

Background In the Slovak Republic, with a population of 5.4 million, a Myastenia Gravis Centre was established in 1978. Out of 927 registered myasthenia gravis (MG) patients, 817 were alive (most of them in remission) up to December 31, 2001, indicating the prevalence rate of 149.2 per million population. Sex – females 571, males 356 (ratio 1.6:1).
Objective and results 84 female MG patients (61 in clinical remission: no symptomatology, no therapy) delivered 109 newborns, 7 (6.4%) having signs of transient neonatal myasthenia (TNM). There was no correlation between acetylcholine receptor antibodies, the myasthenic symptoms of mothers and occurrences of TNM. Two newborns of the same mother, who was at both deliveries in clinical remission, had the most severe TNM with respiratory insufficiency. All 7 newborns had a good response to acetylcholinesterases. The transient neonatal symptoms disappeared 2–5 weeks after the birth.
Four MG females who need a long-term immunosuppressive therapy (because of MG severity and MG relapses) became gravid during immunosuppressive therapy. They refused interruption, one also prenatal investigation, and all gave birth to healthy newborns. In females with manifest MG, the symptoms worsened markedly in 10 patients, one needed artificial respiration.

These empirical observations are explainable by studies documenting the immunosuppressive effect of alpha-fetoprotein. However, we observed a manifestation of MG in the second trimester of gravidity in three women.

P 1063

Breaking of nervous realization and magnetic stimulation

E. V. Graf
Altai Diagnostic Centre, Banal, RUSSIAN FEDERATION

Infections and AIDS Neurological manifestations of systemic diseases

P 1064

Pattern of clinical manifestations in early and late neuroborreliosis

E. Manole, M. Gavriliuc
Scientific and Practical Centre of Neurology and Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA

Objective To identify the possible range of nervous system injures in Lyme borreliosis depending on the duration of disease and differential diagnosis.
Methods The study was done in the Scientific and Practical Centre of Neurology and Neurosurgery from the Republic of Moldova on a sample size of 57 patients with average age of 42 years (ranging 16–79 years) selected throughout 1997–2001. The diagnosis was made based upon history data of a tick byte and/or the presence of a migrating erythema and identification of specific antibodies in the serum and CSF whereby indirect immune fluorescence test, ELISA test and Western Blot technique.
Results The tick byte was recalled by 36.8% of patients. The migrating erythema was recorded in 28% cases. Cranial mono- and multi-neuritis (43.7%) or peripheral radiculo-neuritis (28.5%) dominated in early neuroborreliosis. The facial nerve was the most often injured one: 49% of all neurological manifestations of Lyme disease and 93% of all cranial nerve impairment. In 12 patients, Bell's palsy was associated with concurrent sings of trigeminal involvement. Axonal distal chronic polyneuropathy and Lyme encephalopathy with 17% each were the most often encountered neurological manifestation in late borreliosis.
Conclusions *Borrelia burgdorferi* infection entails multiple lesions at the central and peripheral nervous system level and a differential diagnosis should be made with acute and chronic neurological conditions. Neuroborreliosis might be the first and the only manifestation of the Lyme disease.

P 1065

Effect of acetyl-L-carnitine on painful neuropathy; HIV related

M. Osio[1], L. Zampini[1], F. Muscia[1], L. Valsecchi[1], C. Mariani[2], A. Cargnel[1]
[1]Ospedale L Sacco, Milano, ITALY, 2Università degli Studi, Milano, ITALY

Introduction Distal sensitive polyneuropathy (DSP) is one common neurological complication during HIV infection. Possible pathogenetic hypothesis are the role of TNF-alpha and the reduced blood levels of endogenous acetylcarnitine. Acetyl-L-Carnitine (ALC) is a safe and well-tolerated drug in the treatment of DSP in HIV+ patients. ALC supplement may represent a valid therapeutic option.
Method Twenty HIV- positive patients affected by neuropathic pain with EMG-evidence of DSP were enrolled. Patients with mini-mental test score, less than 24, acute cytomegalovirus infection, demyelinating neuropathies were excluded. All patients were treated with ALC at the dose of 1 gr t.i.d. for 4 weeks. A visual analogue scale (VAS) was used to evaluate characteristics of patient's pain before, during, and after treatment. EMG assessment was performed before and after treatment.
To evaluate changes in VAS score, we used non-parametric Friedman's test (F). Wilcoxon's test (W) was performed to time the appearance of pain improvement and to evaluate neurophysiological data.
Results The changes in VAS score were statistically significant during ALC treatment (mean score: before 6.7±2.1– after treatment 5.0±2.1) ($F=P<0.001$). The appearance of therapeutical effect was reached during the first week ($W=P<0.03$) and during the fourth week ($W=P<0.05$) of treatment.
Neurophysiological data showed a statistically significant improvement of peroneal nerve motor parameters ($W=P<0.02$).
Conclusions Our data show the efficacy of ALC in the treatment of neuropathic pain. The analgesic effects appear during the first week of treatment according with pre-clinical data in different experimental models of pain.

P 1066

Electromyography characterization of polyneuropathy in the first found tuberculosis

M. M. Gerasimova, L. V. Chichanovskaya, N. Y. Vlasenko, A. Y. Petushkov
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Affection of nervous system in tuberculosis is now widely known.
The aim of this study was the investigation of the clinical electromyographical features of polyneuropathy in tuberculosis.
615 men with first found and untreated tuberculosis were examined. Among them 107 people (mean age 37) suffered from polyneuropathy. The patients were subjected to neurological, immunological and electromyography examinations. Level of antibodies to the basic protein myelin was determined using immunoenzymatic method. Electromyographical examining consisted of the defining of the velocity of impulse conducting along motor and sensitive nerve, the value of sensory and muscular answers. The control group consisted of 20 people of the same sex and age.
The neurological examining showed the following forms of polyneuropathy: Sensitive (84%), motor (5%) and mixed (11%). Electromyography revealed the decrease of the velocity of impulse conducting along sensitive nerve fibre in all cases (32.7±1.35 m/s) that reliably differs from results in control groups (56.2±4.8 m/s, $p<0.001$). The size of M-answer and sensory were the same as in control group. The delay of impulse conducting is considered to be a sign of demyelination. High level of antibodies to the basic protein myelin is evidence of demyelinational pattern of affection in peripheral nerves. That level in main group was a 0.199±0.002 unit of optical density (UOD), and in the control group – 0.077±0.01 UOD.
Therefore, the study showed presence of polyneuropathy in 17.4% of cases in first found tuberculosis. Most of them were manifested in form of sensory polyneuropathy with demyelination character.

P 1067

Role of antibodies to myeloperoxidaze in pathogenesis of secondary cerebral vasculitis

M. M. Gerasimova, B. M. Tikhomirov, L. V. Chichanovskaya, L. V. Vdovin
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Secondary cerebral vasculitis can arise in various allergic conditions caused by inflammatory process, drug effect, parasitic infection, paraneoplastic syndrome, etc.
Clinically cerebral vasculitis is manifested in both acute and chronic cerebral insufficiency. However, cerebral vasculitis is rarely diagnosed due to neurologist's little knowledge of this pathology. Antibodies to myeloperoxidase (AM) are a reliable marker of primary systemic vasculitis. The aim of this study was revealing the role of AM in cerebral vasculitis dynamics.
45 patients with secondary cerebral vasculitis were monitored. Of these, the discussed pathology developed on the background: in 15 cases of tuberculosis of the lungs, in 20 cases of drug disease, in 10 cases of a chronic infection of otolaryngologic pathology.
Clinically secondary cerebral vasculitis manifested in the dispersed cerebral microsymptomatology syndrome, focal symptomatology and neurangiosis. In 30% cases ophthalmoscopy showed retinal vasculitis which occurred in presence of "muffs" and oedemas along the vessels. Besides, cerebral vasculitis was combined with general symptoms: asthenia, sweating, sub febrile status.
Study of the level of AM showed its reliable ($p<0.001$) increase compared to the control group (correspondingly 2.8±0.2 UOD and 0.08±0.02 UOD). AM were determined with the help of immunoenzymatic analysis (testing systems of CLARC company, USA). At that, the degree of neurological symptomatology expressiveness correlated with the level of rising of AM ($Q=+0.7\pm0.02$).
Thus, high titers to myeloperoxidase in secondary cerebral vasculitis are evidence of presence of immune inflammation in small vessels including cerebral vessels. The obtained data prove that AM can serve as a secondary cerebral vasculitis marker.

P 1068

Cognitive impairment, depression and quality of life – comparison between coeliac disease patients and reflux disease patients

L. K. Luostarinen
Paijat-Hame Central Hospital, Lahti, FINLAND

Background Association of coeliac disease and dementia has been described. In this study, we evaluated cognitive symptoms, depression, and quality of life among well-treated CD patients on gluten-free diet compared to patients with gastroesophageal reflux disease.
Methods The study group consisted of twenty-eight patients with diagnosis of CD and the control group of twenty-seven patients with gastroesophageal reflux disease. All patients were asked for neurological examination. Cognitive status was evaluated by using MMSE and 3MSE scale. Depressive symptoms were measured with Beck depression inventory and general well being with PGWB index.
Results 3MSE scale showed cognitive impairment (3MSE <90) altogether in five (17.9%) out of 28 CD patients and one (3.7%) out of 27 reflux disease patient ($p=$n.s). MMSE scale showed cognitive impairment (MMSE <=27) in six (28%) CD patients and one reflux disease patient ($p=0.0485$). Correlation between MMSE and 3MSE test results was 0.85 ($p<0.001$).
Seven (25%) CD and twelve (44%) reflux disease patients were depressive according to Beck inventory, (n.s.). Mean of overall general well-being score was 102 with CD patients and 93.7 with reflux disease patients, ($p=0.0095$).
Conclusion CD patients do have increased risk for cognitive impairment compared to reflux disease patients. CD patients do not suffer from depressive symptoms more often than patients with reflux disease. Quality of life with CD patients on gluten free diet is normal.

P 1069

Neurological complications during dialysis

G. Mihailescu[1], C. Mihailescu[1], M. Ticmeanu[1], I. Cojocaru[1], I. Monda[2]
[1]UMF Carol Davila, Bucharest, ROMANIA, [2]Colentina Hospital, Bucharest, ROMANIA

Patients with end-stage renal disease eventually require haemodialysis, peritoneal dialysis and/or renal transplantation. Apart from removing unwanted substances from the blood while adding desirable components, using the available dialysis techniques can also induce new neurological conditions.
We performed a retrospective study on 91 patients; neurologically normal at the different start dates of dialysis, receiving haemodialysis (HD) or continuous ambulatory peritoneal dialysis (CAPD). From this group, 31 patients (18 male, 13 female) with the age ranging from 30 to 79 years developed neurological complications in one-year duration. More than one neurological complication occurred in 16% of these patients. In the 10 patients receiving CAPD, the following conditions occurred: cerebral vascular accidents (CVA's) – 6 cases, the majority recognizing an ischemic mechanism, polyneuropathy – 4 cases, uremic encephalopathy – 1 case. In the group receiving HD (21 patients), there have been 4 cases with CVA's, 8 cases with polyneuropathy, encephalopathies (hypertensive – 5 cases, uremic – 1 case, Binswanger – 2 cases, hydro electrolytic disturbances – 2 cases), 2 cases with carpal tunnel syndrome and 2 cases with cerebral atrophy.
Most of the encephalopathies developed in the early years after the start of dialysis, whereas CVA's, polyneuropathies and cerebral atrophy occurred mostly later. A close neurological follow-up of the patients receiving dialysis is therefore justified, the clinical and paraclinical investigations being aimed to avoid irreversible neurological complications and to help the nephrologists move from one form of therapy to another as indicated by the degree of success and incidence of complications with each.

P 1070

Intramedullary sarcoidosis: two atypical cases

S. Perdigão[1], S. Pereira[1], J. Resende[2], M. Costa[1]
[1]Neurology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL, [2]Neuroradiology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL

Introduction Neurological involvement in sarcoidosis appears in 5 to 15% of the cases, and medullary involvement is uncommon. We report two cases of intramedullary sarcoidosis. In the first case, there was no systemic involvement and in the second, ocular and skin involvement accompanied the neurological picture.

Case Reports A 41 year-old man presented with a 4-month history of lumbar pain and gait and sphincter disturbances; examination revealed a spastic paraparesis, hyperreflexia, and a sensory level by D4–D6. Serological studies were normal, including ACE. MRI showed diffuse spinal cord enlargement with hyper intense T2 signal between D4–D5 and D10–D11, with contrast enhancement. Spinal biopsy was consistent with sarcoidosis. 2. A 36 year-old man presented with a 2-month history of gait difficulties and two episodes of blurred vision on his left eye during the last year, which improved with topical therapy. Examination revealed lupus pernio in the ears, and a spastic paraparesis with hyperreflexia. Laboratory evaluation detected increased ACE. MRI showed focal spinal cord areas of high signal intensity at cervico-dorsal levels with contrast enhancement. Ear biopsy was consistent with sarcoidosis.
The clinical course under corticosteroids was favourable in both cases.
Conclusions Intramedullary lesions are infrequently the first manifestation of sarcoidosis, especially when there is no evidence of systemic involvement (case 1). It is also rare in association with lupus pernio and ocular involvement (case 2). The ACE is raised only in case 2, in which systemic manifestations are present. Biopsy is relatively safe and very useful for early diagnosis.

P 1071

Investigation of TNF-alpha, IL-6, IL-8 and of procalcitonin in patients with neurological complications in sepsis

I. Cojocaru[1], C. Musuroi[1], M. Cojocaru[2], S. Iacob[3]
[1]C. Davila University of Medicine and Pharmacy, Bucharest, ROMANIA, [2]Colentina Clinical Hospital, Dept of Clinical Immunology, Bucharest, ROMANIA, [3]M Bals Institute of Infectious Diseases, Bucharest, ROMANIA

Background Some mediators of inflammation are associated with sepsis, involving nervous system.
Objective Investigations of proinflammatory cytokines of TNF-α, IL-6, and IL-8, and of procalcitonin (PCT), proinflammatory protein, in patients with neurological complications in sepsis.
Material and methods TNF-α, IL-6, IL-8, and PCT were prospectively investigated in 62 patients with neurological complications in sepsis. TNF-α and IL-6 were studied both in serum as in the CSF, IL-8 and PCT were studied only in serum. TNF-α, IL-6, and IL-8 were studied by ELISA (R & D Systems), and the PCT by immunoluminometric assay (BRAHMS).
Results Mean value of TNF-α in serum was 578±214 pg/ml, and in CSF was 458±167 pg/ml ($p<0.01$). Mean value of IL-6 in serum was 749±213 pg/ml, and in CSF was 617.5±182 pg/ml ($p<0.01$). Mean value of IL-8 in serum was 332±196 pg/ml ($p<0.01$). Mean value of PCT in serum was 80±16 ng/ml ($p<0.01$).
Conclusions The investigated parameters do not permit the identifying of cases with neurological complications. The increased correlation coefficient between cytokines in serum and in CSF suggests the damage of the blood-brain barrier. The raise of PCT in serum, induced by TNF-α and IL-6, is an argument of the severity of sepsis.

P 1072

Therapeutical particularities in patients with cerebral abscess

C. Musuroi[1], I. Cojocaru[1], G. Mihailescu[1], G. Popa[2], G. Iacob[3]
[1]C Davila University of Medicine and Pharmacy, Bucharest, ROMANIA, [2]Colentina Clinical Hospital, Dept. of Neuroimaging, Bucharest, ROMANIA, [3]C Davila University of Medicine and Pharmacy, Dept. of Neurosurgery, Bucharest, ROMANIA

Background Modern investigations facilities permit a faster diagnostic of cerebral abscess and the appropriate management.
Objective To observe the particularities of some cases with cerebral abscess.
Material and methods Retrospective study of 32 cases with cerebral abscess.
Results The pathogenesis of the cerebral abscess was: haematogenic–12 cases, during cyanogenic cardiac diseases–7 cases, otogenic–4 cases, synusal–2 cases, post cranio-cerebral trauma–1 case, unknown–6 cases. The organisms were identified in 17 cases. The topography of the abscess was: supratentorial–25 cases, (basal ganglia–7 cases), subtentorial–4 cases, and mixed–3 cases. The number of abscesses was: single–26 cases, multiple–6 cases. The management was neurosurgical approach in 22 cases (excision–7 cases, stereotaxic aspiration–15 cases) and only antibiotic therapy in 10 cases. Evolution: remission–19 cases, 7 with neurological sequelae of medium severity, 6 deaths. The factors associated with high mortality were: coma at the admission, multiple abscesses, and profound abscesses with intraventricular rupture.
Conclusion Modern imagistic and modern antibiotic therapy allows the abscess cure without neurosurgical intervention in the small abscesses, less than 1 cm. The abscesses with a diameter of 3.5–4 cm, the profound abscesses and those multiple of severe prognosis with high mortality involve stereotaxic attitude and antibiotic therapy.

P 1073

Lyme borreliosis (neuroborreliosis) -consideration on clinical and diagnostic problems

Z. Milovic, S. Vujisic, S. Milic
KCCG, Department of Neurology, Podgorica, YUGOSLAVIA

Introduction: Lyme borreliosis (Neuroborreliosis) is most commonly reported tick disease in Europe and America. Infection can be sub clinical or have a range of clinical presentation. The diagnosis should be made after careful evaluation of the clinical history, physical findings, laboratory evidence and exposure risk evaluation.
Objective The main goal of the study was to correlate the clinical manifestation of neuroborreliosis and to the other neurological diseases with similar clinical, neuroimaging findings, particularly problems appear in cases with negative serology
Methods We present two patients with definite diagnosis of Neuroborreliosis who appeared with atypical clinical manifestation. The other 2 patients who had fulfilled some criteria of MS, but as well with some clinical symptoms of borreliosis, positive oligoclonal bands in CSF, MR with some atypical demyelinating plaque, and negative ELISA. They had a history of being in endemic tick area. Therapy with high doses of methylpredenisolone was without significant benefits. We provided therapy with doxycycline and observed that the main neurological deficits were withdrawn.

Results Two patients with definite diagnosis of neuroborreliosis, serology positive and other 3 patients with probably diagnosis as well had good response on antibiotic therapy.
Conclusion A positive serology is indicative of exposure to the organism and should not be considered proof of active infection. Serological test (ELISA) is further confounded by the evidence of seronegative Lyme cases. The CSF is typically normal in chronic Lyme diseases particularly in polyradiculoneuropathy and encephalopathy-encephalomyelitis. These findings make a differential diagnosis of neuroborreliosis more difficult.

P 1074

Demyelinating encephalopathy in Lyme disease

T. I. Muravina, I. A. Zavalishin, I. A. Ivanova-Smolenskaya, P. A. Fedin, A. V. Sakharova, S. M. Lozhnikova, M. V. Sokolova, V. L. Zaeekin
Institute of Neurology, Russian Academy of Medical Sciences, Moscow, RUSSIAN FEDERATION

Introduction Lyme disease (LD) is an endemic infectious polysystemic disease. Its causative agent is B. burgdorferi Spirochaeta transmitted by ixodes ticks. Neurological manifestations include aseptic meningitis, encephalitis, cerebellar ataxia, neuritis, plexites, and polyradiculoneurites.
Methods We have observed 9 patients with diagnosis of Lyme disease, neuroborreliosis, and demyelinating encephalopathy. The following methods were used: clinical, neurophysiological (EEG, EMG, evoked potentials), MRI, electron microscopy, antibody titres, DNA analysis by PCR method.
Results The neurological symptomatology was represented by meningoencephalitis in combination with neuritis of cranial nerves and radiculoneuropathies. The MRI of the brain revealed in the deep compartments of the white matter bilateral hypo intensive foci that was regarded as the demyelinating process. Seven patients had history of migrating erythema, 5 patients had arthritis, all the patients lived in the endemic regions, and therefore in all the patients titers of antibodies of Borrelia burgdorferi in the blood serum and liquor were studied. The levels of the specific antibodies in the blood serum were high in all patients and those in the liquor in 5 patients. The DNA assay of both the serum and liquor in all 9 patients yielded positive results for borrelia. The electron microscopy of the muscular tissue found borrelia in 5 patients. The study of evoked potentials (visual, brainstem, somatosensory and cognitive) showed rough changes, mostly at the basal ganglia-cortex level of the cerebral hemispheres. EMG revealed in 8 patients the myopathy-like syndrome.
Conclusion Demyelinating encephalopathy is encountered in Lyme disease. High titres of antibodies, detection of borrelia by electron microscopy confirm this.

P 1075

Atypical form of tick-borne encephalitis: A case report

A. M. Sergeev[1], A. A. Skoromets[2], A. A. Sergeeva[1], V. A. Gusev[1], N. B. Zhitny[1], D. Y. Lupandin[1]
[1]Republican Hospital of Karelia, Petrozavodsk, RUSSIAN FEDERATION, [2]St Petersburg State Medical University, St Petersburg, RUSSIAN FEDERATION

Background Tick-Borne Encephalitis (TBE) is a zoonotic arbovirus infection endemic to many European countries and Russia. There are three main clinical forms: febrile, aseptic meningitis and focal neurological form.
Case history A 44-year-old male, non-vaccinated, living in endemic area had used unpasteurized milk in May. After 4 days, he developed fever, deterioration of consciousness, seizures. Neurological examination revealed signs of meningeal irritation, nystagmus, facial (right) palsy, bulbar symptoms, asymmetric quadriplegia, loss of tendon reflexes, respiratory impairment and bladder sphincter involvement.
He had normal routine laboratory investigation. Serological tests were negative for lues, VIH and for Borrelia burgdorferi. There were high levels of IgM and IgG antibodies against TBE in serum. CSF study showed 224 cells (neutrophiles 16%, lymphocytes 84%). The CSF total protein content was 1,25 gr/dl. The patient was investigated by MRI scan of the brain and EEG. The displayed changes had a non-specific character (moderate hydrocephaly, diffuse disrhythmia). EMG disclosed an axonal sensorimotor polyneuropathy.
Because of the finding of positive serological test for TBE, combined treatment was started. The adjuvant intramuscular immunoglobulin against TBE, plasmapheresis, high-dose (IV) methylprednisolone, intravenous immunoglobulin and respiratory reanimation formed the basis of therapy in an intensive care unit. The patient improved after 3 weeks. He could walk with support 8 months later.
Conclusion TBE can have a total form as meningoencephalomyelopolyradiculoneuropathy.

P 1076

Neurological complication in children with parenteral and perinatal HIV-infection

M. Y. Fomina
St-Petersburg State Paediatric Academya, Sanct-Petersburg, RUSSIAN FEDERATION

The neurological disorders of HIV-infection is a clinical syndrome complex manifested by varying and sometimes discrepant degrees of cognitive, motor, behavioural impairment.
We studied 125 parenteral and 31 perinatal HIV-infected children.
Methods clinical and neurological data, results of electroencephalography, magnetic resonance imaging.
Results 76 parenteral HIV-infection children in stage AIDS have AIDS-dementia complex; 31 – decrease memory and attention, 18 – distal polyneuropathy. All perinatal HIV-infected infants retarded of psychomotor development, 8 patients have a progressive encephalopathy.
Conclusion Progressive AIDS-dementia-complex – is a more frequent neurological syndrome in children.

P 1077

Functional state of the blood-brain barrier in patients with herpes zoster ganglionitis

V. Trezkova, G. Nedzved, L. Matusevich
Research Institute of Neurology, Neurosurgery and Physiotherapy, Minsk, BELARUS

Herpes zoster virus persists in cranial and spinal ganglia and under unfavourable conditions reactivates and causes ganglionitis.
We studied 62 patients with Herpes zoster ganglionitis aged 17-84 years with 36 females among them. Cerebrospinal fluid (CSF) was examined in 34 (54.8%) patients. The functional state of the blood-brain barrier (BBB) was assessed using albumin index (AI): $AI=A_{CSF}/A_{blood}*1000$.
15 patients (24.2%) had signs of general infection in the prodromal period, 30 patients (48.4%) had pain syndrome and 17 patients (27.4%) had skin manifestations. The patients were divided into 2 groups subject to the BBB functional state. The

first group included 12 patients (35.3%), average age 65 years, with the moderate impairment of BBB permeability (8–25 units). The prevailing concurrent diseases in this group were coronary heart disease, arterial hypertension, and diabetes mellitus. CSF total protein level was in the range of 0.6–1.2 g/l (X=0.83±0.06 g/l), cytosis was 2–330 cells/l (X=35.4±10.5 cells/l). It was increased in 7 (58.3%) patients. 5 patients (41.6%) developed complications: keratouveitis, postherpetic neuralgia. BBB function (3.6–7.8 units) was preserved in 22 patients (64.7%), average age 42 years, from the second group. CSF total protein level was in the range of 0.18–0.6 g/l (X=0.35±0.02 g/l). Cytosis was increased in 12 patients (54.5%), X=72.9±28.6 cells/l. Benign course of the disease, complete recovery and no complications were typical for the patients from this group.
The severity of herpes zoster ganglionitis is subject to the patient's age, concurrent cardio-vascular disease and BBB functional state.

P 1078

Rare case of recurrent narcotising myelitis episodes from viral infection

E. Tzamourani - Vontzalidou[1], A. Kiamili[2], A. Rossidou[2], T. Vasilopoulos[3], V. Kosceridou[3]
[1]General Hospital of Elefsina, Athens, GREECE, [2]General Hospital of Elefsina - Neurology Dept., Athens, GREECE, [3]General Hospital of Elefsina "Thriassio", Athens, GREECE

The rate of onset an inflammatory damage in spinal cord may be acute or sub acute and the process often ascends or spreads transversely, and acute or sub acute cord lesions may occur that exactly mimic transverse myelitis. Usually the spinal lesion does not repair, but the distinction may not be easy in the acute stage.
A 40-year-old female patient developed severe inflammation of the thoracic cord with severe pain, areflexic paraplegia and loss of sphincter control
The spinal fluid showed two cells. The total protein proportion <20%. Oligoclonal bands normal. Glucose concentration normal. Magnetic resonance imaging: thoracic cord swelling, a large area (T3–T9) necrosis.
Complete recovery occurred after treatment with high dose intravenous methyl-prednisolone and acyclovir.
Two years later, she developed the same neurological symptoms 15 days after the cutaneous rash of herpes zoster. MRI: spinal demyelination (T7). Complete recovery occurred after the same treatment.
The diagnosis of transverse myelitis is often made by exclusion and the precipitating cause is often not identified. In our case, the cutaneous rash and the similar clinical and pathological findings during the two episodes signify that it is about herpes zoster myelitis.

P 1079

Splenic lymphoma presenting as progressive multifocal leukoencephalopathy (PML)

R. Rego[1], S. Pereira[1], M. J. Santos[2], C. Alves[1]
[1]Neurology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL, [2]Hematology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL

Introduction Until the appearance of AIDS, PML was considered a rare disease occurring in middle-aged or elderly persons as a terminal complication of chronic lymphatic leukaemia or other lymphoproliferative diseases.

Case report A 51 year-old woman presented with a six-month history of humour and personality changes, followed by progressive visual loss. On admission she was alert, oriented and without mental impairment. She was unable to establish visual contact and could only vaguely distinguish movement and light. The pupils were midsize, equal and slowly reactive to light. No other neurological signs were found. General physical examination was normal. The brain MR showed bilateral and confluent hyper intense lesions on T2-weighte images at both parieto-occipital areas. The CSF cytochemical profile was normal, but PCR for the JC virus was positive. HIV infection was ruled out. Subsequent investigation with thoraco-abdominal CT, lymphocyte immunophenotyping, immunoglobulin pattern and bone marrow biopsy, led to the diagnosis of splenic lymphoma with bone-marrow invasion and severe cellular and humoral immunosuppression. She was readmitted two weeks later with a respiratory infection, severe anaemia and cognitive impairment. She died soon after, eight months after the first symptoms.
Conclusions This woman's six months progressive disease and brain MR abnormalities were very suggestive of PML. The CSF PCR for JC virus is highly specific and establishes the diagnosis, nowadays rarely dissociated with HIV infection. This is a peculiar form of presentation of a relatively indolent lymphoproliferative malignancy. The literature is scarce regarding the management of non-HIV associated PML.

P 1080

Cerebral Whipple's disease without gastrointestinal symptoms

P. Abreu[1], E. Azevedo[1], A. Santos[1], M. Carvalho[1], L. Lobo[2], A. Ribeiro[2], C. Moura[3], S. Pereira[1], C. Pontes[1]
[1]Neurology Department, Hospital S.João, Porto, PORTUGAL, [2]Gastroenterology Department, Hospital S.João, Porto, PORTUGAL, [3]Pathology Department, Hospital S.João, Porto, PORTUGAL

Background Whipple's disease (WD) is a rare systemic bacterial infection caused by *Tropheryma whippelii*. Brain manifestations comprise slowly progressive dementia, supranuclear ophthalmoplegia, ataxia, hypothalamic dysfunction and oculomasticatoryskeletal myorhythmia. Cerebral WD treatment should be performed with antibiotics that reach the central nervous system (CNS) for at the least one-year.
Clinical case A 40-year-old male started in 1999 a slowly progressive encephalopathic clinical picture with abulia, mild to moderate cognitive dysfunction, bilateral ophthalmoplegia, dysarthria, dysphonia, facial and superior limbs refractory myorhythmia, mild ataxia and loss of weight (although no intestinal symptoms nor clinical malabsorption syndrome), and lately rhythmic adducting ocular movements. Copper metabolism and CSF study were normal (14.3.3 protein was negative). EEG showed non-specific slowing and sometimes-periodic complexes. Brain magnetic resonance showed non-specific lesions mainly on the ganglionary region. Muscle biopsy with respiratory chain study was normal, as was the genetic study for dominant ataxias. Diagnosis of WD was made 2.5 years after the first complaints, with a duodenal biopsy disclosing numerous PAS-positive foamy macrophages. The patient was started on intravenous ceftriaxone for 15 days followed by a long-term treatment with oral trimethoprim-sulfamethoxazole, but has only shown a partial regression of the symptoms.
Conclusion WD is rare but even rarer is the CNS involvement without gastrointestinal symptoms. The clinical presentation and the findings encountered in the duodenal biopsy suggest

that this entity. This case alerts for the earlier recognition of WD in patients with exclusively neurological manifestations because it is a potential treatable disease.

P 1081

Pathogenic mechanism of neurosensory bradyacusia in tuberculosis

M. M. Gerasimova, V. A. Chichanovsky
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Patients suffering from lung tuberculosis can develop neurosensory bradyacusia whose cause is commonly regarded as ototoxic effect of antituberculosis drugs. However, in some cases this lesion can occur in patients with first found lung tuberculosis and cannot be explained by drug ototoxicity. In this study, we analyse pathogenic mechanisms of neurosensory bradyacusia in first found tuberculosis.
107 patients with first found and untreated tuberculosis aging from 20 to 51 (mean age – 37) were monitored. All patients were subjected to detailed neurological and otoneurological examination. Besides, basophile specific damaging response (BSDR) and antibodies to myeloperoxidase were determined. The control group consisted of 20 persons.
Neurosensory bradyacusia of different degrees of severity was observed in 29 (27.1%) cases. All patients showed multiple cerebral and focal neurological symptomatology, neuroangiosis, and polyneuritis. Immune tests showed sensibilisation to tubercle bacillus. Thus, tuberculin BSDR in the main group was 18.3±0.67% compared to 5.2±0.63 in the control group ($p<0.001$). At the same time, the degree of hearing impairment correlated with the level of tuberculin allergization ($R=0.66\pm0.002$). High level of antibodies to myeloperoxidase was found in all cases (1.3±0.02 ODU compared to 0.08±0.01 in the control group, $p<0.001$). This evidences of vasculitis with affection of small vessels. Thus, bradyacusia in cases of first found tuberculosis was caused by an allergic factor as a result of sensibilisation to tubercle bacillus. Bradyacusia in tuberculosis may be caused by vasculitis, for vessels and connecting tissues are involved in the allergic process.

P 1082

The affection of nervous system in tuberculosis

M. M. Gerasimova, L. V. Chichanovskaya, A. Vdovin
Tver Medical Academy, Tver, RUSSIAN FEDERATION

Presently we are observing considerable increase of nervous system affection in tuberculosis. However, the pathogenesis of neurological disorders has not yet been subjected to a thorough analysis. The aim of this study was to investigate the pathogenic mechanisms of neurological disorders in tuberculosis.
260 patients with primary pulmonary tuberculosis were examined. Along with clinical and neurological examination we determined level of antibodies to myeloperoxidase, anti-DNA, antibodies to basic protein myelin, performed the test of specific alteration of basophiles with tuberculin.
The following neurological syndromes were observed: focal lesion (8%), disseminated microsymptoms (43%), vegetative dystonia (31%) and polyneuropathy (18%). In all patients we observed positive test of specific alteration of basophiles with tuberculin – 16.47±0.36, in control group – 5.21±0.63 ($p<0.001$). The level of antibodies to myeloperoxidase was 1.93±0.084, in control group – 0.62±0.03 ($p<0.001$), anti-DNA was 0.321±0.048, in control group – 0.196±0.008 ($p<0.001$), the level of antibodies to basic myelin protein was 0.221±0.01, in control group – 0.077±0.01 ($p<0.001$).
There was correlation between the degree of nervous system affection and the increase of titre of test of specific alteration of basophiles with tuberculin and rest of the tests.
The obtained data evidence that the patients with tuberculosis and pathology of nervous system have allergic status. The clinical picture of neural pathology in tuberculosis presents itself in forms of allergic cerebral vasculitis with focal lesions, disseminated microsymptoms and primary symptoms of insufficiency of cerebral haemodynamics, polyneuropathy, which is caused by vasculitis of peripheral vessels.

P1083

Peduncular hallucinosis in a patient with brain metastases

D. Parissis, I. Poulios, G. Karkavelas, I. Milonas
Ahepa Hospital, Aristotle University, B Department of Neurology, Thessaloniki, GREECE

Introduction Peduncular hallucinosis represents a rare cause of complex visual hallucinations. The content of these hallucinations is striking and fairly stereotyped, involving animals and human figures in bright colours and dramatic settings. Peduncular hallucinosis manifests itself usually in lesions of vascular nature, which are commonly localized in the rostral brainstem. These lesions are thought to impair the fidelity of the retino-geniculo-cortical transmission by affecting the ascending reticular formation. To our knowledge, the characteristics of peduncular hallucinosis have not been previously described as the presenting feature of metastatic carcinoma of the brain.
Patient and methods A previously healthy 53-year old man developed over a period of two weeks complex visual hallucinations; consisting of human figures in vivid colours, cartoon animals moving near the bed of the patient and flowers of outstanding beauty. Insight was preserved. The patient developed ataxia of gait a few days later. A computed tomography of the brain demonstrated multiple lesions in the cerebral hemispheres and the posterior cranial fossa, while brainstem structures were compressed by the mass effect produced by a large lesion in the cerebellar vermis. Following treatment with dexamethasone the hallucinations subsided. A biopsy specimen performed from a parietal lesion showed malignant infiltration with histological features of an underlying large cell carcinoma of the lung.
Conclusion Whereas prior cases of peduncular hallucinosis have been described in association with brainstem compression by an extrinsic source, our case was significant because metastatic carcinoma of the lung has not been previously reported as a cause of this syndrome.

P 1084

Astrocytoma gemistocyticum in common variable immunodeficiency

J. Pentela-Nowicka, K. W. Selmaj
Medical University of Lodz, Lodz, POLAND

Common variable immunodeficiency (CVID) is a rare acquired disease of unknown cause. Immunodeficiency syndrome is characterized by low levels of most or all immunoglobulin classes. The major clinical features associated with CVID are: recurrent infections, autoimmune inflammatory diseases and malignancy. Such neoplasms as: lymphomas, adenocarcinoma of the gastrointestinal tract and ovary were found with increased frequency in patients with CVID. To our knowledge, there was **no report** on patient with CVID and primary neoplasm of CNS.
32-years old men had medical history with recurrent infection, tuberculosis and hepatitis C. None of the immunoglobulins IgA and only trace amounts of IgG and IgM were found in his

serum. He was treated with the i.v. infusion of immunoglobulin concentrates in a dose of 400 mg/kg, once every three weeks for four years. The patient had two-month history of progressive right hemiparesis, dysarthria and dysphagia. MRI examination revealed high signal intensity lesion on T2-weighted images in periventricular area on the left side and low signal intensity on T1-weighted images in the same area. Stereotactic biopsy and histopathological examination revealed *Astrocytoma gemistocyticum II°* WHO. The patient was treated with interstitial brachytherapy of CNS, HDR mode (Ir^{192} in total dose 1500 cGy/isodose included the tumour in 10 fractions). In addition, he received an adjuvant telegammatherapy.

P 1085

Cerebellar ataxia and emotional instability due to anti-glutamate decarboxylase-antibodies (anti-GAD) of 65 kD

D. Ulbricht[1], F. Macian[2], R. J. Metz[1]
[1]Centre Hospitalier de Luxembourg, Luxembourg, LUXEMBOURG, [2]Centre Hospitalier de Luxembourg, Centre Hospitalier Universitaire Limoges, FRANCE

Introduction Antibodies against glutamate decarboxylase were originally assigned to the pathophysiology of stiff-man syndrome. Recently, a strong association with other progressive neurological diseases was affirmed and immunological treatment is under discussion. We report on a case of progressive cerebellar ataxia and emotional instability due to anti-GAD successfully stabilized by immunoglobulins.
Case report A 52 year-old woman presented cerebellar ataxia with emotional instability and intermittent confusion of insidious onset and subacute progression. Diagnostic work-up including magnetic resonance imaging, neurophysiology, vascular exams, tumour search, mammography and extensive laboratory parameters were normal but for slight hyperthyreosis and anti-GAD 65 with a titre of 61800 U/ml. Treatment with immunoglobulins was initiated and led to an impressive stabilisation of gait and stance as well as diminished melokinetic ataxia and dysarthria. Affect became stable. In a two-year's course, there was a further slight amelioration of the psychopathology more than motricity, and no tumour was detected at follow-up.
Discussion Anti-GAD autoantibodies are found to participate in an increasing number of neurological disorders as in this case of cerebellar ataxia. The psychiatric disturbance might have been due to either an encephalopathic affection due to anti-GAD or being constituted by the cerebellar affection itself. As this represents a treatable condition, search for this class of antibodies seems to become mandatory in progressive neurological disease despite the lack of specificity regarding the clinical syndrome.

P 1086

Acute primary Iliopsoas and adductor magnus abscess presented with proximal leg muscle weakness

F. Devetag Chalaupka
Ospedale S. Maria del Prato, Feltre (BL), ITALY

Pyomiositis is an infection of the striated muscle seen frequently in Africa, but rarely in Western countries with a temperate climate.
We report the case of a 77 year-old woman who presented frequents falls, low back pain, left thigh and groin pain, but she was afebrile. The neurological examination showed a left proximal leg muscle weakness without sensory disturbance and reflex involvement. The investigations of the nervous system were negative. The serum electrophoresis, ESR and CRP were abnormal, while the blood cultures were negative. A computed tomography of the pelvic region showed a 4x10 cm left iliopsoas abscess and a 5x5 cm homolateral adductor magnus abscess. No obvious source of infection was seen. The abscess was caused by Staphylococcus aureus. Our patient did not respond to systemic antibiotic therapy, but she recovered completely with surgical resection of the abscess.

P 1087

Meningoccocal meningitis presented as sudden coma

S. Pereira[1], C. Granja[1], A. Sarmento[2], C. Alves[1]
[1]Neurology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL, [2]Intensive Care Unit, Hospital Pedro Hispano, Matosinhos, PORTUGAL

Introduction Vieusseux described Meningoccocal meningitis for the first time in 1805. It affects infants in particular but also adolescents and young adults. It is still a serious illness even after the introduction of antibiotics. Meningoccocal disease can have atypical presentations ranging from acute fulminating sepsis to prolonged febrile states or isolated psychiatric symptoms.
Case report A previously healthy 23 year-old female was found unconscious on her bed, one hour after complaining of feeling unwell, without vomiting, headaches or fever. She was admitted within the following hour, and presented in coma with spontaneous breathing, midsize fixed and dilated pupils, absent oculocephalic reflexes, no pain response and no neck stiffness. Her temperature and blood pressure were normal. There was no rash. Laboratory studies showed leucocytosis (19.510/µl with 90% neutrophiles) and hypernatremia (150 mEq/l), with normal chemistry panel and clotting times, negative blood cultures and toxic screening. CT scan showed diffuse brain swelling. She progressed to respiratory failure and hypotension over the next hour. Lumbar puncture (performed after brain death tests) revealed WBC 4474 with 98% neutrophils, high protein (118 mg/dL), and low glucose content (4.89 mg/dL). A CSF culture produced C group Neisseria meningitidis.
Conclusion This patient presented with a fulminant meningitis evolving to brain death in approximately two hours, without any of the classical symptoms. Meningoccocal disease presenting as a rapid onset sepsis is relatively frequent, but fulminating meningitis is rare. No references were found in the literature to any case with such a rapid and atypical course.

Peripheral nerve disorders
Spinal cord and root disorders
Neuro-ophthalmology, Neuro-otology

P 1088

An electrodiagnostic study on efficacy of intracarpal steroid injection in carpal tunnel syndrome (CTS)

H. Ayromlou, A. Pashapoor, H. Ghanizade
Tabriz University of Medical Sciences and Health Services, Tabriz, ISLAMIC REPUBLIC OF IRAN

Introduction Carpal tunnel syndrome (CTS) is one of the most common entrapment neuropathies in which the median nerve is involved in the carpal tunnel. Intracarpal steroid injection into the carpal tunnel was evaluated as a therapeutic method in this study.

Method In a prospective study 30 patients including 56 hands with electrodiagnostic criteria of CTS of mild and moderate (severe class excluded) were treated by injecting 20 mg triamcinolone H.A. into the involved canal and observed for a period of 6 months. Patients were visited and electrodiagnostically tested 30–40 days after injection, in case of no improvement in electrodiagnostic criteria, the injection was repeated and patients were re-examined 30–45 days later. In case of any disease progress despite therapy patients were referred for surgery.
Results 22 of 30 patients were 30–60 years old and 23 of them were female. In 26 CTS patients CTS was bilateral. Before therapy, 17.9% of patients were in the mild class and 82.9% in the moderate class. After therapy, 30% of patients had mild and 66% had moderate CTS, while 4% showed criteria of complete resolution.
Conclusion Ephaptic transmission in ischemic entrapped median nerve is a definition for CTS symptoms that can be ameliorated by anti-inflammatory effects of steroids, which improve the integrity of neural membranes. In view of the convenience of steroid injection with no systemic side effects apart from contraindication in diabetics, we recommend this method of therapy for mild and moderate CTS cases.

P 1089

Central motor conduction time in alcoholic axonal neuropathies

V. S. Lisnic[1], D. G. Gherman[1], C. M. Grosu[2], E. I. Cibotaru[1], C. A. Margina[2]
[1]Medical State University, Chisinau, REPUBLIC OF MOLDOVA, [2]Center of Neurology & Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA

Objective Alcoholic axonal neuropathies (AAN) are frequently associated with signs of central nervous system (CNS) impairment. Studies estimating the CNS functional state in neuropathies are not numerous. The goal of the study was to establish the diagnostic value of motor evoked potentials (MEP) in AAN.
Method 62 patients (55 males and 7 females) examined with neuropathies attributed to daily excessive consumption of alcohol (greater than 100 ml ethanol) for 3 years or more. The routine nerve conduction studies were completed by MEP studies.
Results Nerve conduction studies revealed signs of axonal neuropathy in 54 patients (87.1% cases). In the other 8 patients signs of autonomic fibres affection prevailed in the picture of neuropathy. Clinical signs of CNS impairment were detected in 37 patients (59.7% cases). They manifested by cerebellar, pyramidal signs and pseudobulbar syndrome. The central motor conduction time (CMCT) was increased in 39 patients (62.9% cases), being also elevated in cases without clinical signs of CNS disturbance. The mean CMCT value was 9.8±1.2 ms at recording from m. abductor pollicis brevis and 22.3±1.9 ms – from m. abductor hallucis. The amplitude of MEP varied considerably, being significantly lower than in the control group. In 5 cases MEPs after transcortical magnetic stimulation could not be obtained.
Conclusion MEP proved to be a sensitive method to establish the implication of the CNS motor structures in the pathological process in AAN. CMCT is frequently increased even when clinical signs of SNC affection are not present.

P 1090

Indications of lower extremity nerve grafting

M. Dididze
Tbilisi State Medical University, Tbilisi, GEORGIA

Introduction For a variety of reasons lower extremity nerve injuries have poor history of successful repair and are generally neglected despite studies of repair of nerve injuries of the upper extremity. The goal of our study was to determine the direct indications and terms of surgery at lower limbs nerve injury.
Method 65 patients with nerve lesions of the leg were evaluated at an average follow-up of 4 years. To assess the return of motor, sensory and trophic function grading systems were used. From electrophysiological methods EMG examination was carried out.
Results 17 cases had good recovery of leg function, 21 satisfying, 15 useful, and 12 poor restoration. All good results were connected with early surgical intervention – up to 2 months, as well as with young age. All cases (42) with severe trophic disturbances like deep ulcers and erosions had functional recovery. EMG examination revealed increased motor and sensory nerve conduction velocity, amplitude of compound muscle and sensory nerve action potentials.
Conclusion Even partial restoration of trophic disturbances in spite of presence of deep paresis or hypoesthesia, becomes the main determinative factor in providing gait function. Thus presence of severe vegetative symptoms is the indication of surgical intervention in traumatic damage of lower limb nerves. Early surgical treatment is most likely to have good outcome. Although the results of lower limb nerve injuries typically have been dismal, our study refutes this opinion and we believe that the repair of lower extremity nerve injuries will be proven to be successful and worthwhile.

P 1091

The pronator teres syndrome in clinical practice

A. Bogunovic Rastovcan, B. Rastovcan
Polyclinic for Neuropsychiatry ABR, Zagreb, CROATIA

Introduction The pronator teres syndrome (PTS) is a rare form of entrapment of nervus medianus between two heads of the musculus pronator teres.
Method In all patients the strength of musculus flexor hallucis longus, m. flexor digitorum profundus, m. pronator quadratus was tested as well as their sensory impairment. Needle EMG, motor nerve conduction and CMAP amplitude, as well as sensory nerve conduction with ring electrodes and SNAP of medianus were performed.
Results 6 patients were evaluated. The first 3 cases had normal EMG findings. The other 3 had sensory impairments and signs of heavy motor lesions. In 2 cases showed acute lesions with muscle fibrillations. In the third chronic case a mild lesion of flexor digitorum sublimis was detected. Motor nerve conduction was normal, CMAP amplitude was decreased. All 3 cases with sensory impairment had decreased or absent SNAP in the same fingers in which sensory impairment was present. In two acute cases full recovery was achieved, accompanied by increase of CMAP amplitude and SNAP.
Conclusion We met PTS more often than isolated anterior interosseous syndrome. Needle EMG should be done, except in the innervation area of nervus interosseous anterior in the abductor pollicis brevis and possibly flexor digitorum sublimis. Decreased CAMP is increased in course of recovery. Sensory loss is not typical and covers only some parts, exceptionally complete innervation area of medianus. Increase of SNAP amplitude follows the clinical recovery. The initial milder PTS could be without evident neurological disturbance or by EMG proven lesion.

P 1092

Bell's palsy over a four-year period: The unexpectedly high incidence during the NATO strike attacks against Yugoslavia

S. Perovic[1], G. Toncev[2], B. Milicic[3], A. Gavrilovic[2], S. Toncev[2]
[1]Healthy Center, Kragujevac, YUGOSLAVIA, [2]Clinical Hospital Center, Kragujevac, YUGOSLAVIA, [3]Institute for Medical Statistics and Informatics, Kragujevac, YUGOSLAVIA

Introduction Bell's palsy is a lower motor neuron, ipsilateral facial paresis affecting roughly 20 people per 100,000 per year. The origin is still unclear. The aim of this study was to investigate the incidence of Bell's palsy over a four-year period, including the time of war.
Method In a retrospective study from March 24th 1998 to March 23rd 2002, 406 Bell's palsy patients (142 male and 251 female) were analysed (in an area of 350,000 inhabitants). The total time period was split into16 intervals of 3 months each, including the air strike period, and those periods coincided with seasons (spring, summer, autumn and winter). Data were analysed according to age, gender and seasonal distribution of cases.
Results An unexpectedly high incidence of Bell's palsy was found during the NATO air strike period (77 patients or 18.96% of all cases, $p<0.001$). Women were more sensitive to the appearance of Bell's palsy than men (65.27% vs. 34.73%, $p<0.001$) in the total group. There was no difference in sex distribution between different seasonal periods.
Conclusion We suggest unusual life conditions during the air strikes and high-intensity stress as factors predisposing possible viral infection may be included in Bell's palsy appearance.

P 1093

Unusual multifocal motor neuropathy associated with lymphoma - case report

B. Tomik[1], G. Zwolinska[1], M. Wojcik[2], J. Furgal[1], M. Banach[1], E. A. Gryz[1], Z. Rudzki[3], A. Szczudlik[1], A. Skotnicki[2]
[1]Department of Neurology CMUJ, Krakow, POLAND, [2]Department of Haematology CMUJ, Krakow, POLAND, [3]Department of Pathology CMUJ, Krakow, POLAND

Introduction The association of motor neurone disorders with lymphoproliferative diseases is well documented in literature. Subacute motor neuropathy is usually associated with lymphoma, although this association is not fully understood.
Case description A right-handed 60-years-old male presented with five-months history of frequently remitting pure lower motor neurone (LMN) signs. There was no evidence of bulbar, sensory or mental involvement. The past medical history was negative. Six months after the onset of signs, the disease progressed rapidly and flaccid proximal paresis occurred in the left limbs. There was no evidence of infection, immunodeficiency or paraproteinemia in serum and CSF examinations. We found no abnormality in laboratory screening including autoantibodies, viral and HIV infection tests. NCT studies identified multifocal motor neuropathy (MMN) with conduction block. The patient's clinical status improved shortly after human immunoglobulin administration and few days later deteriorated again without any response to further immunotherapy. At that time the clinical examination also showed enlargment of the left submandibular lymph nodes. Ultrasonography of the neck and supraclavicular regions revealed many augmented lymph nodes bilaterally. CT of mediastinum and ultrasonography of abdominal cavity were normal. The histopathological examination of the submandibular lymph nodes identified malignant non-Hodgkin's B-cell lymphoma (lymphocyticum diffusum). Immunophenotypic study of bone marrow identified a "mantle cell lymphoma" with co-expression of CD19/CD5 and lack of CD23 lymphocytes. After diagnosis local radiotherapy was introduced. Currently there is no improvement in the patient's neurological status and he is under continuous observation. Interestingly, the neurological presentation preceded signs of lymphoma.

P 1094

The significance of anti-gm1 antibodies in patients with Guillain-Barré syndrome

I. Basta, A. Vujic, D. Lavrnic, Z. Stevic, R. Trikic, V. Rakocevic Stojanovic, S. Pavlovic, S. Apostolski
Institute of Neurology, Belgrade, YUGOSLAVIA

Introduction Guillain-Barré syndrome (GBS) is an autoimmune polyradiculo-neuropathy which can be associated with significantly elevated level of serum anti-GM1 antibodies.
Methods We investigated 48 patients with GBS, 21 males and 27 females. The sera of all investigated patients were tested for the presence of anti-GM1 antibodies using an enzyme-linked immunosorbent assay (ELISA). The sera of 22 patients were examined for the presence of antibodies to 63 kDa flagellar protein from Campylobacter jejuni (Cj) serotype O.19 using ELISA and Western blot.
Results Anti-GM1 antibodies were detected in 58.3% in IgG and in 68.7% of patients in IgM class. Gastrointestinal infection was present in 42.3% of anti-GM1 positive patients. Anti-Cj antibodies were detected in 59% of these patients. In 81.3% the presence of anti-GM1 antibodies was associated with the elevated antibody titre to Cj ($p<0.01$). Patients with positive serology to GM1 were more severely affected than sero-negative patients ($p<0.05$). Electrophysiologically, 57.6% of anti-GM1 positive patients had sensory-motor neuropathy. In 93.3% the illness was due to axonal degeneration and only in 6.7% due to demyelination ($p<0.05$). Patients with negative GM1 serology had similar distribution of the neuropathy type. 73.4% of sero-positive patients had residual weakness after the treatment, while 84.8% of sero-negative patients recovered completely ($p<0.01$).
Conclusion We conclude that anti-GM1 antibodies were not only responsible for the pathogenesis of the pure motor, but are also detected in patients with sensory-motor neuropathy. Only association of anti-GM1 and anti-Cj antibodies was regarded as a bad prognostic factor in our group of patients.

P 1095

The significance of anti-gm1 and anti-sulphatide antibodies in patients with polyneuropathies

I. Basta, A. Vujic, D. Lavrnic, Z. Stevic, R. Trikic, V. Rakocevic Stojanovic, S. Pavlovic, S. Apostolski
Institute of Neurology, Belgrade, YUGOSLAVIA

Introduction Since recent studies showed great differences in the presence of anti-GM1 and anti-sulphatide antibodies in patients with polyneuropathies, we wanted to determine the presence of these antibodies in our patients.
Methods We analysed 72 patients, 46 male and 26 female, with polyneuropathy. Pre-treatment serum samples were tested using an enzyme-linked immunosorbent assay for the presence of anti-GM1 and anti-sulphatide antibodies.
Results Anti-GM1 antibodies were present in 40.3% in IgG and in 37.5% in IgM class. Sero-positive patients had earlier onset of the disease. In 57.1% the disease started in the 4th or 5th decade ($p<0.05$). These patients had more severe neurological disability in comparison to sero-negative patients ($p<0.05$).

There was a correlation between the presence of anti-GM1 antibodies and axonal form of the disease, which was found in 71% of anti-GM1 positive patients ($p<0.05$). The presence of anti-GM1 antibodies was an indicator of the longer duration of the disease and worse outcome. No improvement was registered in 72.5% of sero-positive patients, while 56% of sero-negative patients had significant clinical improvement after the treatment ($p<0.01$). Anti-sulphatide antibodies were found in 58.3% of patients with sensory neuropathy, who also had a longer course of the disease and worse outcome, which was significantly different in comparison to sero-negative patients ($p<0.05$).
Conclusion We found anti-GM1 antibodies mostly in younger patients with greater disability and axonal neuropathy. The presence of anti-sulphatide antibodies only in patients with sensory neuropathy confirms their role in the pathogenesis of sensory nerve disorders.

P 1096

Neurophysiological determination of the carpal tunnel syndrome in patients with chronic demyelinating polyneuropathy

D. Cocito[1], G. Isoardo[1], P. Ciaramitaro[2], B. Bergamasco[1]
[1]Dipartimento di Neuroscienze, Università di Torino, Torino, ITALY, [2]U.O.A. Neurochirurgia, C.T.O., Torino, ITALY

Introduction The goal of our study was to determinate a specific neurophysiological method to confirm the clinical diagnosis of carpal tunnel syndrome (CTS) in patients affected with chronic inflammatory demyelinating polyneuropathy (CIDP), and to investigate the cause of the disproportionate distal motor latency of the median nerve in patients affected with CIDP with anti-MAG antibody (MAG-PN).
Methods We evaluated 4 groups of patients: a) 10 CIDP (20 hands), mean age 58 years, range 30–67, without clinical signs of CTS; b) 8 MAG-PN (16 hands), mean age 52, range 45–65, without clinical signs of CTS; c) 8 CIDP (16 hands), mean age 41, range 34–60, with clinical signs of CTS (CTS CIDP); d) 22 healthy controls, mean age 40, range 22–65. The diagnosis of CTS is based on clinical criteria. The following electrophysiological parameters were evaluated: a) antidromic sensory conduction velocity of median and ulnar nerve between wrist and, respectively, second and fifth finger. b) distal motor latency (DML) to abductor pollicis brevis and abductor digiti minimi muscles and the elbow to wrist motor conduction velocity of median and ulnar nerve. c) Terminal Latency Index (TLI) of median and ulnar nerve; d) Motor latency of the median nerve to second lumbar and of ulnar nerve to second interosseous muscle and their difference (L-I DIFF).
Results L-I DIFF was the most sensitive electrophysiological parameter in order to detect presence of CTS in patients with CIDP. Moreover we believe that median suffering at the wrist is a distinctive electrophysiological feature in MAG-PN.

P 1097

Effect of sodium valproate on electrophysiological parameters and Mc-Gill pain questionnaire in patients of diabetic painful neuropathy

T. Srivastava[1], K. Dk[2], J. Netti[2], A. RP[2]
[1]All India Institute of Medical Sciences, New Delhi, INDIA, [2]S.P.Medical College, Bikaner, INDIA

Introduction Sodium valproate is one of the first line anticonvulsants, which is very effective and well tolerated. As the available treatment modalities of painful neuropathies are not completely satisfactory and the various anticonvulsants play a definitive role in the treatment hence we sought to study the effect of sodium valproate in this indication.
Method The study was performed on 60 patients of type 2 diabetes suffering of painful neuropathy. The design of the study was double blind, placebo controlled. The patients were divided into 2 groups, patients of group A received 1200mg of sodium valproate daily in divided doses, and group B received similar type of two tablets of placebo for the duration of 1 month. Each patient was assessed by clinical examination; pain score, electrophysiological examination including motor and sensory nerve conduction velocity, amplitude and H-reflex and McGill pain questionnaire initially and at the end of the 1 month time period.
Results The present study was performed on 52 patients. In our study motor and sensory conduction including H-reflex were deranged in the beginning of the study in diabetic patients of both groups and there was no improvement in electrophysiological parameters of patients at the end of the, except mild improvement in distal latency of Tibial nerve. Significant improvement in pain score was noticed in patients receiving sodium valproate in comparison to patients receiving placebo at end of the 1-month treatment period ($p<0.05$).
Conclusions There is no improvement in electrophysiological parameters by sodium valproate in diabetic painful neuropathy but the treatment provides magnificent subjective improvement in painful diabetic neuropathy.

P 1098

Axonal multifocal motor neuropathy

L. Lispi, S. Galgani, M. Zucco, M. Giacanelli
San Camillo Hospital, Roma, ITALY

Introduction Multifocal motor neuropathy (MMN) is a demyelinating neuropathy in which conduction blocks (CB) are considered mandatory for the diagnosis of the disease.
Method We reviewed data from patients presenting to our hospital with: pure motor neuropathy; asymmetric weakness with individual peripheral nerve distribution; no signs of upper motor neuron involvement; electrodiagnostic testing that failed to show CB or any other demyelinating features.
Results We identified 2 male patients. Pat.1: 70 years old with 3 years duration of illness presenting with asymmetric weakness in the hands and – to a lesser extent – proximal arms with right predominance and slight muscular hypotrophy. No sensory signs or upper motor neuron involvement, normal cervical spine MRI, no anti-GM1, anti-MAG, anti-sulfatide antibodies, no CB or other features of demyelination were detected. He was treated with IVIg without improvement.
Pat.2: 18 y.o. with 2 years duration of illness presenting with weakness and muscular hypotrophy in the right hand and forearm and with minimal involvement of the left one. No sensory or upper motor neuron signs, normal cervical spine MRI (performed in hyperflexion too), no anti-GM1 antibodies, no CB or demyelinating features were detected. He was treated with IVIg with clinical and EMG improvement.
Conclusion Our data confirm other previous observations that patients with clinical features of MMN without evidence of demyelination and GM1 antibodies should receive an empiric treatment with immune modulating therapy. The lack of demyelinating features could be due to inability to find focal lesions in difficult testing sites or Multifocal Axonal Motor Neuropathy could represent a primarily axonal process.

P 1099

The aetiology of acute peripheral facial nerve paralysis in diabetic patients: is it also viral?

S. M. A. Said
Alexandria University, Alexandria, EGYPT

Objective The goal of this study was to examine the aetiology of acute peripheral facial paralysis (APFP) in diabetic patients.
Introduction There is a lot of recent evidence suggesting that reactivation of latent herpes simplex virus (HSV) or varicella-zoster virus (VZV) infection of the geniculate ganglia is the main cause of APFP (Bell's palsy). Whether diabetes mellitus makes the nerve more vulnerable to virus infection or it is the vascular theory that explains the increased prevalence of DM among patients with APFP is not known yet.
Method 40 diabetic patients with APFP were enrolled in the study (23 males and 17 females, 54.42+8.67 years). Another 40 non-diabetic patients were enrolled as a control group. Paired sera were obtained from all patients in both groups within the 4th day after disease detection and 2 weeks later. We measured IgM and IgG antibodies to HSV and VZV in these sera by ELISA. Demonstration of IgM antibodies or a 4-fold increase in IgG antibody titer were considered positive evidence for the infection of either of these viruses.
Results There was no significant difference between diabetic and non-diabetic patients in sero-positivity to VZV (35% vs. 25%, P>0.05) and HSV (57.5% vs. 37.5%, p>0.05). There was no significant difference between the diabetic and non-diabetic patients for the sero-positivity for both viruses (72.5% vs. 82.5%, p>0.05)
Conclusion APFP in diabetic patients is mostly due to reactivation of either HSV or VZV infection.

P 1100

Painful familial amyloid polyneuropathy type I associated with permanent pacemakers for sick sinus syndrome

S. Kopishinskaya, A. Gustov, M. Gorskii
Dept. of Neurology, Nizhny Novgorod Medical Academy, Nizhny Novgorod, RUSSIA

Introduction This paper reports a family in Russia with familial amyloid polyneuropathy type I (FAP type I) with aggressive painful sensorimotor syndrome and permanent pacemakers for sick sinus syndrome.
Method The investigated family had 4 members of two generations (3 brothers and the mother's sister). Other causes of neuropathy were excluded. Sural biopsy and electrophysiological studies were carried out on all patients. Also all 4 patients had implantations of permanent DDD pacemakers for bradyarrhythmias.
Results Sural biopsy in all patients showed positive Congo red staining. Electrophysiological studies revealed mixed axonal and demyelinating polyneuropathy.
Conclusion FAP type I is a rare disease characterized by sensorimotor polyneuropathy, autonomic nervous system, and cardiac conduction system dysfunction. The initial symptoms were cardiac, such as sick sinus syndrome with the sensory loss of lower extremities, painful constant acroparesthesias and joint discomfort. The age of onset was about 1 to 2 decades. As the disease progressed, the upper extremities and motor ability were also involved. To our knowledge, this is the first human report of the painful FAP type I polyneuropathy and pacemaker implantation.

P 1101

Polyneuropathy as an adverse reaction to alprazolam – first reported case

E. Azevedo
Hospital S. João, Porto, PORTUGAL

Introduction Polyneuropathy is often a drug-induced disease. Our intention is to present the first case of polyneuropathy as an adverse reaction to alprazolam.
Clinical case 78-year-old lady, with anger and anxiety, taking verapamil, magnesium, alprazolam (0.5 mg t.i.d.) and lorazepam (1mg o.d.) since 1998. In August 1999 the patient started to show a slowly progressive mainly sensitive polyneuropathy picture. In May 2000: she was observed by a neurologist, as she already showed severe walking disability, distal motor and sensory deficit with distressing dysesthesias and symptomatic xeroftalmia and xerostomia. She was on started gabapentin for treatment of the dysesthesias. Electromyography revealed axonal polyneuropathy with marked involvement of sensitive fibres. Analytic study was normal, including sedimentation rate, reactive protein C, haemoglobin A1C, proteinogram, folate, B12, syphilis, ANA and anti-SSA/SSB serology and thyroid function. In June 2000 the drug regime was changed from alprazolam to loflazelate 1mg o.d., as an association between alprazolam and xerostomia had been previously reported. A rapid improvement of mucous dryness and slowing down of polyneuropathy, both on clinical and electromyographic terms, was verified. The patient recovered and returned to a normal life.
Conclusion Following the OMS-1991 probability score, we could only classify this adverse reaction as probable, as we have not re-challenged the patient with the drug, for ethical reasons. Improvement after introduction of loflazelate and maintenance of lorazepam are against the hypothesis of an idiosyncratic group-effect of benzodiazepines. The authors could not find any description in the literature connecting polyneuropathy with alprazolam or other benzodiazepine, stressing the idea that theoretically any drug can be incriminated on the aetiology of a polyneuropathy, and alerting for the detection of other cases.

P 1102

Peripheral neuropathy in rheumatoid arthritis

G. Albani[1,2], S. Ravaglia[3], C. M. Montecucco[4], L. Cavagna[4], R. Pignatti[1], A. Montesano[1], S. Albani[5], A. Mauro[1,2]
[1]Istituto Auxologico Italiano, Piancavallo (VB), ITALY, [2]Department of Neurosciences, University of Studies, Turin, ITALY, [3]Institute of Neurology "C.Mondino", University of Studies, Pavia, ITALY, [4]Department of Rheumatology, S. Matteo Hospital, University of Studies, Pavia, ITALY, [5]Laboratory of Immunology, University of Studies, San Diego, CA, USA

Introduction The occurrence of polyneuropathy in Rheumatoid Arthritis (RA) and the correlation with the clinical features of the disease has not yet been well defined. It is often difficult to diagnose these slight or early neuropathies and neurological evaluation of RA patients may be difficult to interpret, since some neuropathic findings, particularly muscle weakness and sensory disturbances, may be confused with symptoms resulting from pain in joints and limitations of movement. Aim of this study was to assess the ENG pattern of polyneuropathy, its relationship with RA clinical parameters and with neuropathic clinical scores.
Method Thirty-eight (28 females) outpatients with RA classified by ACR criteria, aged 26–65 years (mean 53), with a disease duration of 1–34 years (mean 8.7) were studied.

Polyneuropathy was evaluated with a questionnaire (Neuropathic Symptoms Score, NSS), physical examination (Neuropathy Disability Score, NDS), quantified sensory testing (QST), and neurophysiological measurements.
Results Abnormalities as indicated by the questionnaire (NSS) were found in 8/38 patients, while an abnormal neurological examination (NDS) was found in 17/38. In 13/38 patients ENG signs of polyneuropathy were detected, mostly consisting of mild or moderate sensory axonal neuropathy.
Conclusion Clinical examination alone is not sensitive enough in detecting polyneuropathy in patients with RA, since associated symptoms (pain, limitation of movement) may be confused with neurological dysfunctions such as sensory and motor disturbances. The inclusion of an ENG examination therefore is recommended in the global assessment of RA patients, even when history and clinical examination are not suggestive of peripheral nerve involvement.

P 1103

Incidence of blink-reflex abnormalities in patients suffering from idiopathic trigeminal neuralgia

I. Mikula, R. Negovetic, S. Miskov, V. Demarin
Neurology Clinic, KB Sestre milosrdnice, Zagreb, CROATIA

Objective We performed a study to determine the incidence of Blink-reflex abnormalities and EEG changes in patients suffering from idiopathic trigeminal neuralgia.
Method The study was performed on 25 patients diagnosed according to the ICD-X criteria. We measured amplitudes and latencies of the ipsilateral early phasic component (R1) and the bilateral late tonic component (R2, R2'). EEG was recorded using the International 10–20 EEG system. The results were compared to those of the control group.
Results In the group of subjects suffering from idiopathic trigeminal neuralgia the Blink-reflex results showed prolonged latencies of both R2 and R2' when stimulating the afflicted side, and normal latencies of all components when stimulating the contralateral side. The latencies of late components have exceeded the normal range (+2.5 SD) in 35% of the cases. EEG changes, mostly diffuse or bitemporal appearance of theta waves, were found in 27% of the subjects tested. EEG findings and Blink-reflex late components latencies showed a high level of correlation with each other as well as with frequency of symptoms.
Conclusion We believe that Blink-reflex changes are more frequently encountered among patients with idiopathic trigeminal neuralgia than EEG abnormalities.

P 1104

Guillain Barré syndrome: New therapeutic trial

W. F. Elbeshlawy[1], E. Kasem[2]
[1]Neurology Dept., Tanta Faculty of Medicine, Tanta, EGYPT, [2]Physical Medicine Dept., Tanta Faculty of Medicine, Tanta, EGYPT

Objective The goal of this study was to evaluate the response of Guillain-Barré syndrome (GBS) patients to IV pooled γ-globulin in combination with IV pulse methylpredenisolone therapy.
Introduction GBS is an acute immune-mediated disease of the peripheral nervous system. Plasma exchange (PE) and high-dose IV immunoglobulin (IVIg) showed to be equally effective in the past, but still therapeutics are costly and morbidity is still considerable. Additional treatment needs to be developed.
Method We studied 9 patients (group I), and diseased control group of 7 patients (group II) with GBS through diagnostic criteria (Asbury and Cornblath, 1990). Electrodiagnostic testing was performed at entry and after 8 weeks, (Meulstee, and van der Meche, 1995). The therapeutic effect on group I through IV pooled γ-globulin in a dose of 30 mg/kg/day and IV pulse methylpredenisolone in a dose of 20-30 mg/kg/day for 5 days was compared with the therapeutic effect on group II through IVIg (3 patients) and PE (4 patients). Function was ranked on admission, according to the scale of Hughes (1990). Outcome was measured after 8 weeks, the end point of this study.
Results After the beginning of combined IV pooled γ-globulin and pulse methylpredenisolone in group I, 5 patients showed improvement by 2 functional grades, and 4 patients showed complete recovery. Among group II, 3 patients improved by two functional grades, 2 patients improved by 1 functional grade, and the other 2 patients remained stationary.
Conclusion GBS patients can benefit from the use of IV pooled γ-globulin and pulse methylpredenisolone therapy.

P 1105

Epidemiological data about polyneuropathies in Romania

D. C. Marinescu, O. Bajenaru
University Hospital, BUCHAREST, ROMANIA

Introduction Epidemiological data from Eastern European countries are still very difficult to collect and lack consistency. We present the first study about epidemiology of polyneuropathies (PN) in Romania based on data from the National Medical Statistic Committee (NMSC).
Method Incidences of different types of PN at three main levels of medical care (general practitioner – family doctor, specialist from ambulatory and specialist from hospital care) were collected from NMSC for the year 2000. The classes of PN registered were those from the International Classification of Diseases. Data were also analysed by age, sex and urban/rural distribution and availability of methods of investigations.
Results Globally, PN represented 15% (63797 cases) of all neurological disorders newly diagnosed in 2000. 43% (27433 cases) of diagnoses were made almost exclusively clinically by family doctors, with similar proportions between rural and urban patients. Ambulatory care specialists first diagnosed PN in 38% cases, in an overwhelming majority in urban population. In hospitals (19% diagnoses) urban and rural population have similar addressability. The much larger access to investigations allowed cathegorisation of PN as: inflammatory (26.1%), hereditary (10.8%), toxic-drugs induced (56.4%), autonomic (6.7%).
Conclusion In Romania, diagnosis of PN is made mainly in ambulatory settings, where it is largely clinical and lacks etiological specificity. Some types of PN are surely underestimated. This situation is reversed in hospitals; the most refined etiological diagnosis (including nerve and muscle biopsy, genetic testing etc.) can be accomplished in a few centres. The situation is improving with increasing development of private medical centres.

P 1106

NADPH-diaphorase expression in the peripheral nerve and its changes in diphtheritic polyneuropathy and Guillain-Barré syndrome

A. Sakharova, S. Lozhnicova, V. Pirogov, M. Piradov
Institute of Neurology, Russian Academy of Medical Sciences, Moscow, RUSSIAN FEDERATION

Introduction It is known that only select cell populations have nitric oxide synthesis (NOS), and until recently there was no knowledge about its presence in peripheral nerves (PN). We were the first, who histochemically demonstrated the existence of this enzyme in Schwann cells (SC) of PN by using NADPH-diaphorase (NADPH-d). We found that NADPH-d activity is permanently present in all parts of SC cytoplasm and is ultrastructurally localized on nuclear membranes and membranes of the endoplasmic reticulum. Axon and myelin were devoid of enzyme activity.
Method In the present study the localization and ultrastructural distribution of NOS was determined in biopsies of n. suralis specimens from 7 patients suffering from diphtheritic polyneuropathy (DP) and 6 patients suffering from Guillain-Barré syndrome (SGB).
Results In DP, SCs showed destructive and reparative processes. A reduction of enzyme activity was detected in those cells that took part in utilization of destroyed myelin. In the remyelinating SCs, NADPH-d activity was prominent not only in cytoplasm but in the nucleus as well.
In GBS, the main participants of pathological processes are immunocompetent cells. High diversity and temporal gradient of NADPH-d activity were found in mononuclear cells. NADPH-d activity was high in migrating monocytes and those and interacting with SC, and low or absent in phagocytes
Conclusion Our results suggest that NADPH-d in SCs is associated with the constitutive form of NOS, which takes part in myelin maintenance and remyelination. In immunocompetent cells, NADPH-d belongs to the inducible form of NOS, that produces nitric oxide periodically, in response to induction, in addition to known cytokines.

P 1107

Myasthenia gravis and functional status of the afferent ways of the spinal cord

A. G. Remnev
Altai Diagnostic Centre, Barnaul, RUSSIAN FEDERATION

How does realization of excitation on the afferent ways of a spinal cord (AWSC) change at the presence of Myasthenia gravis (MG)? Patients suffering from MG first of all have infringement of transfer of excitation from nerves to muscles. The question of the functional status of the afferent ways has not been studied until now. We have developed a new method of rating for the functional status of the AWSC in our laboratory (Russian patent for the invention No. 2136328).
Method This method is carried out through magnetic stimulation of the central nervous system (CNS). Using this diagnostic approach we investigated 26 patients (19–46 years) with MG (the general form) and 30 healthy individuals.
Results In the healthy group the speed of realization of excitation on the AWSC was 90.3±1.7 m/s (mean±standard error, m/s – meters per one second). When studying the functional status of the AWSC we found attributes of infringement of realization of excitation on the AWSC (decrease) in 20 patients (76.9%) with a speed of up to 56.1±2.6 m/s. In 17 patients (85.0%) the changes were bilateral.
Conclusion The insufficiency of realization of excitation on the AWSC could be due to difficulties of realization of stimulating processes. The reason of these changes may consist of infringement of synaptic transfer of excitation between afferent neurons of the CNS. Besides, the insufficiency of realization of excitation on the AWSC to CNS paths may be caused by activation of braking processes.

P 1108

Isolated spinal neurosarcoidosis – a challenging diagnosis

P. Abreu, M. Carvalho, M. J. Rosas, C. Neves, C. Pontes
Department of Nervous System Diseases, Hospital S.João, Porto, PORTUGAL

Introduction Sarcoidosis is a chronic inflammatory multisystemic disease of unknown cause that in some cases may exclusively affect the nervous system. The isolated involvement of the spinal cord is rare and may cause problems of differential diagnosis because a biopsy of the lesion is not always feasible. The authors present a challenging case of possible isolated spinal neurosarcoidosis.
Clinical presentation Female; 68 years old with type 2 diabetes mellitus. She was admitted due to fluctuating complaints of backache, paresthesias and leg weakness with one year of evolution, which had worsened in the previous month. On neurological examination she had areflexic paraparesis (grade 3), sensitive level at T9, loss of vibration in the ankles and knees, urinary incontinence and constipation. Spinal MRI showed diffuse enlargement of the cord from T6–T12, with poor intramedullary enhancement after gadolinium. Gallium-67 SPECT revealed elective fixation in the spinal cord at the same level. CSF studies, cerebral MRI, chest radiograph, thoracic CT and serum angiotensin-converting enzyme levels were unremarkable. Infectious, neoplastic, toxic, and endocrine causes were excluded. A biopsy was not performed due to the localization of the lesion. We introduce corticosteroid therapy with sustained clinical improvement. She was able to walk two months later.
Conclusion This case reflects the difficulty in making a definitive diagnosis when histology is not available. Nevertheless the clinical picture, neuroimaging, response to therapy and exclusion of other pathologies lead to the diagnosis of possible isolated spinal neurosarcoidosis.

P 1109

Vascular chronic ischemic myelopathy: clinical, imaging and electrophysiological examination

M. Gavriliuc[1], D. G. Gherman[2]
[1]Center of Neurology and Neurosurgery, Kishinev, REPUBLIC OF MOLDOVA, [2]Medical and Pharmaceutical "Nicolae Testemitsanu" State University, Kishinev, REPUBLIC OF MOLDOVA

Introduction We present the longitudinal clinical, neuroimaging and electrophysiological study of 75 patients with vascular chronic ischemic myelopathy.
Method All cases were confirmed by neuroimaging examinations: CT-myelograhpy and/or MRI and/or selective spinal angiography. Electrophysiological examination included needle electromyography, sensitive and motor electroneurography, F-wave study, Hoffman reflex, bulbo-cavernosus reflex and motor-evoked potentials. 30 healthy subjects were considered as a group of references. Three vascular syndromes were considered: anterior spinal artery syndrome, syndrome of complete transversal lesion and posterior spinal arteries (artery) syndrome. Clinical and electrophysiological findings were assessed in each cases with etiological factors and the level of ischemic spinal lesion.
Results Electrophysiological abnormalities were founded in 100% of cases. Based on statistical analysis of the results, electrodiagnostic criteria were elaborated for the discrimination of each syndrome of vascular chronic ischemic myelopathy. In addition to this, data were found indicating that ischemic damage of spinal cord tissue causes the morpho-functional re-

organization of motor units and segmental neuro-muscular apparatus. Moreover, as a result of neuronal plasticity at this level of nervous system new programs of motor function are established.
Conclusion The general conclusion of this work is that multimodal electrophysiological investigation as a consciously extension of clinical examination is very important in the positive and differential diagnosis of ischemic disturbances of spinal cord blood circulation. An electrophysiological examination is also useful for the prognosis of ischemic vascular myelopathy and for the control of treatment efficacy.

P 1110

A 65 year-old woman with acute transient encephalopathy and Tarlov cysts

S. Pereira[1], R. Rego[1], J. Resende[2], M. Resende[3], C. Alves[1]
[1]Neurology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL, [2]Neuroradiology Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL, [3]Neurosurgery Service, Hospital Pedro Hispano, Matosinhos, PORTUGAL

Introduction Tarlov or perineural cysts are lesions of the nerve roots often found on the sacral region. Although usually asymptomatic and diagnosed incidentally, they are sometimes associated with low back, sciatic and sacrococcygeal pain, sensory and motor disturbances in the lower extremities, and sphincter disturbances, perhaps as a result of CSF pressure changes.
Case report A 65 year-old woman with previous recurrent episodes of nausea and vomiting attributed to biliary dyskinesia, was admitted to the hospital with a 16-hour history of nausea and vomiting, followed by painful paresthesias and dysesthesias of her legs, buttocks and perianal region, and finally fever and confusion. On evaluation she was obtunded, disoriented, able only to follow simple commands, and with neck stiffness. General examination was otherwise unremarkable. The CSF analysis revealed pleocytosis (990 WBC/mm^3), very high protein content (8.0 g/l) and normal glucose level. Blood and CSF cultures were sterile. Routine blood counts, chemistries, and urine analysis were normal except for leucocytosis. A lumbosacral MRI demonstrated multiple thin-walled fluid-filled sacral perineural cysts with partial sacral erosion. The clinical picture resolved completely and spontaneously in the next 24 hours. She remains well after two years of follow-up.
Conclusion The rupture of intracerebral arachnoid cysts is sometimes associated with chemical meningitis. Our hypothesis is that that during vomiting effort, the transiently high intracranial pressure caused the rupture of a perineural cyst into the subarachnoid space. This in turn could have caused the lower limb symptoms and the subsequent transient encephalopathy, as the result of chemical meningitis.

P 1111

Comparison of tensilon test with ice pack test in diagnosing ocular myasthenia gravis

A. Tabasi[1], P. Tajik[2]
[1]Farabi Eye Hospital, Tehran University of Medical Sciences, Tehran, ISLAMIC REPUBLIC OF IRAN, [2]Students Scientific Research Center, Tehran University of Medical Sciences, Tehran, ISLAMIC REPUBLIC OF IRAN

Introduction Myasthenia gravis is an autoimmune disorder in which acetylcholine receptor antibodies attack the postsynaptic membrane of neuromuscular junction. Patients often have ophthalmologic symptoms. Myasthenia gravis should be considered in every patient with ptosis and/or diplopia. The main diagnostic test for myasthenia is Tensilon test that may produce serious side effects, including significant bradycardia, loss of consciousness, and death. The goal of our study was to compare the results of Ice test with Tensilon test in ptotic patients.
Method Between September 1996 and October 1999, we entered 124 patients with ptosis into our study, and did both ice test and Tensilon test on every patient. The distance between upper lid margin and corneal light reflex was measured before and after a 2-minute application of ice to the ptotic eyelid, two or more millimetres of improvement after ice application was considered a positive Ice test result, then every patient underwent Tensilon test.
Results A positive Tensilon test result was noted in 43 of 124 (34.7%) patients, and the result of ice pack test was completely the same as Tensilon test, and there was no false positive and no false negative.
Conclusion The ice pack test is a simple, short and non-invasive test, which has the same results as the Tensilon test, and can be used instead of Tensilon test for diagnosing myasthenia gravis in ptotic patients.

P 1112

Pregabalin shows no evidence of retinal toxicity

M. G. Brigell, C. M. Carter, F. Smith, E. A. Garofalo
Pfizer Global R & D, Ann Arbor, MI, USA

Introduction Vigabatrin has been shown to cause a predominantly asymptomatic, irreversible, constriction of the visual field in 30%–40% of patients. In this paper we report the results of prospective ophthalmologic testing obtained in therapeutic clinical trials with pregabalin.
Methods Formal visual fields, Snellen acuity, and funduscopic examinations were performed at 3 or 6 month intervals in 3615 patients participating in randomised controlled trials (RCTs) and open-label treatment with pregabalin for treatment of epilepsy, pain and anxiety disorders. 1390 patients were followed for more than 1 year. Cases of visual deterioration were defined through adverse events, judgment by the examining ophthalmologist, and quantitative criteria.
Results In RCTs of up to 3 months in duration, incidence of visual field loss, visual acuity loss and funduscopic change was similar in pregabalin treated and placebo treated patients. For pregabalin and placebo groups respectively, the incidence of cases of visual field loss was 5.3% and 4.8%; visual acuity loss 4.1% and 3.3%; funduscopic change 1.7% and 2.1%. No dose-dependent increase in the incidence of abnormalities was observed (range: 50–600 mg/day). In long-term open label studies some increase in treatment emergent visual dysfunction was seen in high-risk groups (diabetics and elderly). The nature and severity of these events were similar to those seen in placebo treated patients in RCTs. No increase in the frequency of these events was seen in lower risk patients.
Conclusion Following review of more than 3600 pregabalin-treated patients, no evidence of retinal or optic nerve toxicity was found.

P 1113

Medial plantar nerve conduction study in diabetic neuropathy diagnosis

E. Kurca[1], P. Kucera[2]
[1]Neurologic clinic, Jessenius Faculty of Medicine, Martin, SLOVAKIA, [2]1st. Neurological Clinic, Faculty of Medicine, Bratislava, SLOVAKIA

Introduction The standard diabetic neuropathy diagnosis is

based on: 1– symptoms; 2– signs; 3– conduction studies and electromyography; 4– quantitative sensory testing; 5– quantitative autonomic testing. Motor and sensory nerve fibre conduction studies present the so-called golden standard in diabetic neuropathy diagnostic process. Less favourable anatomic conditions in comparison to upper extremities allow in routine clinical practice the investigation of a sole lower extremities sensory nerve – the sural nerve. In our opinion this causes the impossibility to diagnose neuropathy in the early disease stage when only digital nerve branches are affected.

Method The aim of our work is to compare the diagnostic value of medial plantar nerve and sural nerve conduction velocity in diabetes mellitus I. type patients group (39 patients) with respect to the disease duration. The standard superficial antidromic technique was used for both nerves: 1– sural nerve (calf stimulation, lateral ankle registration); 2– medial plantar nerve (medial ankle stimulation, toe registration).

Results The diagnostic value of medial plantar nerve conduction study in diabetic neuropathy is significantly higher than that of the sural nerve. The first pathologic change is the conduction velocity slowing followed by reduction of the SNAPs amplitude and area. The ultimate pathologic change is the absence of the response. All these changes copy the disease evolution along the time

We recommend the antidromic medial plantar nerve neurogram as a useful and easy to realize test in the electrophysiological diagnosis of early stages of diabetic neuropathy.

P 1114

Prolonged optokinetic stimulation generates podokinetic after rotation

C. R. Gordon[1], D. Tal[2], N. Gadoth[1], A. Shupak[2]
[1]Meir General Hospital, Kfar Saba, ISRAEL, [2]Israel Naval Medical Institute, Haifa, ISRAEL

Introduction In previous studies we showed that after prolonged stepping-in-place on the center of a rotating platform, blindfolded subjects could no longer step in place on firm floor. Instead they invariable rotated themselves relative to space without perceiving their rotation, a phenomenon termed podokinetic after-rotation (PKAR). We speculated that prolonged optokinetic stimulation (OKs) alone may generate similar PKAR.

Objective To evaluate the effects of OKs on podokinetic (PK) responses.

Methods Eight healthy subjects participated in the study. After a baseline stepping test they were seated in a closed cabin and randomly (right or left) exposed to an OKs (45deg/sec) covering the whole visual field for 30 min. Following this procedure, blindfolded subjects attempted stepping-in-place on the stationary floor for 30 min.

Results When trying to step in place after OKs all subjects turned relative to space without any perception of rotation. The direction of this optokinetically after-rotation (oPKAR) was opposite to that of the direction of OKs. Mean peak velocity of oPKAR was 7.5 deg/sec and it was reached after about 5–6 min of stepping. After that, there was a progressive velocity decay which exhibited a discharging time constant on the order of 8–10 min.

Conclusions OKs alone causes oPKAR. Long-term OKs probably charges a storage element for podomotor activity with a relatively prolonged time constant. This novel form of neural interaction and adaptive plasticity may have significant implications for treatment of vestibular and other locomotor disorders.

P 1115

Computer program for peripheric monopareses diagnosis

M. Yakushin, V. Neretin
Moscow Regional Research Clinical Institute (MONIKI), Moscow, RUSSIAN FEDERATION

P 1116

Nerve conduction study in diabetic polyneuropathy

V. Khodulev
Research Institute of Neurology, Neurosurgery and Physiotherapy, Minsk, BELARUS

P 1117

Carpal tunnel syndrome related to automobile accidents

R. Baraba Vurdelja
General hospital, Zagreb, CROATIA

P 1118

Neuroprotective treatment of diabetic peripheral neropathy in children

M. A. Lobov, A. Knyazev, B. Bogdanov
Moscow Regional Clinical & Research Institute, Moscow, RUSSIAN FEDERATION

P1119

Functional state of blood-brain barrier of patients with spinal cord pathology

A. V. Astapenko, G. K. Nedzved, G. V. Zabrodets, L. I. Matusevich, N. Y. Shcharbina
Institute of Neurology, Neurosurgery and Physiotherapy, Minsk, BELARUS

P 1120

Spinal nerve root stimulation in radicular pain due to postoperative epidural fibrosis

B. Kepplinger, D. Schafelner, C. Derfler, P. Kalina
Landesnervenklinik Mauer, Mauer bei Amstetten, AUSTRIA

Neurorehabilitaion Neurotraumatology

P 1121

Treatment and rehabilitation of patients with ischemic stroke (IS) and Parkinson's disease (PD) – implementation of new technologies

E. I. Gusev[1], A. I. Grigoriev[2], A. B. Guekht[1], I. B. Kozlovskaya[2], G. V. Serkin[1], E. S. Chickina[1], D. V. Galanov[1]
[1]Russian State Medical University, Moscow, RUSSIAN FEDERATION, [2]Institute for Medical Biological Problems, Moscow, RUSSIAN FEDERATION

Objective Frequency and severity of motor disturbances in IS and PD cause the necessity of developing new methods of rehabilitation.

Method A program of implementation of new technologies in neurorehabilitation (including the method of "dynamic proprioceptive correction") was created. The specially designed corrective suit (CS) was used in 46 patients (28 – with IS sequelae and 18 – with PD). The control group consisted of 30 age- and gender-matched patients with IS or PD of the same severity. The study was single-blind, randomised.
Results After the rehabilitation course Lindmark scale values in IS increased significantly. UPDRS values improved in PD. Transcranial magnetic stimulation (TMS) revealed pronounced (P 1088; <0.05) decrease of central conduction time in IS and increase of amplitude of M-response of m.abd. pol. brevis in the paretic hand. There was improvement (decrease of the duration of M-response) in the PD group. No significant changes in the results of clinical examination and TMS were registered in the control PD and IS groups.
Conclusion Implementation of CS is effective as it increases degree and rate of the restoration in patients with IS and PD. This technology contributes to reduction in spasticity, improves conduction along the corticospinal tract and stability of vertical pose in patients with IS. It decreases muscular rigidity and improves motor activity in PD patients.

P 1122

Prospective analysis of gait improvement in chronic hemiparetic patients following spasticity surgery

K. Fheodoroff, H. Kattner, H. Wanger, W. Fässlacher, M. Freimüller
Gailtal-Klinik, Hermagor, AUSTRIA

Objective Spastic varus deformity interferes with ambulation and often makes brace wear essential. In the treatment of spasticity the role of surgery is still uncertain and needs to be studied and refined. In this prospective analysis we investigate the amount of gait improvement following tendon lengthening and tendon transfer in a small series of patients following a single-case-design.
Method Clinic for Neurological Rehabilitation and Accident Surgery. 7 chronic hemiparetic patients (at least 12 months post onset) with moderate activity limitations (Rankin Scale <3) Evaluation: pre and 3 months post intervention: Rankin Scale (RS), Barthel-Index (BI), Functional ambulation categories (FAC) with shoes and barefoot. 3 months post intervention: Rating of response to treatment (RRT)
Results FAC with shoes showed no significant improvement, but 5 of 7 patients did not need their braces any longer; 2 of 7 patients who needed adapted shoe-wear before were able to wear off-the-shelve shoes afterwards. FAC barefoot improved significantly. RRT showed good acceptance of the method.
Conclusion Gait improvement in properly selected chronic hemiparetic patients may be achieved by spasticity surgery. Brace wear may no longer be necessary. Gait improvement may be demonstrated using widely spread and standardized measuring techniques.

P 1123

Functionally orientated therapies like the mechanized "gait trainer" a possibility for restoring gait in non-ambulant subjects? Including experiences of three years in operation

P. Grieshofer
Institute for Neurorehabilitation and Research, Judendorf Straßengel, AUSTRIA

Introduction In rehabilitation of central neurological diseases many different methods are used at the moment. The theoretical background of every method is based on the neurophysiological function of stimulation and inhibition. Another possibility is the use of the mechanised gait trainer which would allow non-ambulant people to practice a gait-like motion repeatedly. We brought this technological possibility 1998 into operation, to simulate normal gait, discrete stance and swing phases lasting 60% and 40% of the gait cycle and the control of the movement of the centre of mass. A complex gear system provides gait-like movement of two foot plates with a ratio of 60% to 40% between the stance and swing phases. A controlled propulsion system adjusts its output according to the patient's efforts.
Results A non-ambulatory central neurological patient requires little help from a therapist on the gait trainer. Gait movements on the trainer are highly symmetrical, impact-free, and less spastic. The patients have much higher practice frequency of gait cycles in comparison to classical therapeutical methods. On an average of 20 stroke patients there was a difference from 50 (classical method) to 800 (gait trainer) gait cycles per therapy unit.
Conclusion Our experience shows, that the gait trainer allows wheelchair-bound patients repetitive practice of gait-like movements with much higher repetitive practice frequency per therapy unit without overstraining therapists. A European multicenter study will be started to evaluate this new method.

P 1124

Computer-aided aphasia therapy; a teletherapy-setting

W. J. Schupp, B. Seewald, E. Rupp
Fachklinik Herzogenaurach, Herzogenaurach, GERMANY

Objective In view of demographic data and exploding costs of medical care there is demand for innovative concepts to ensure efficient treatment of patients suffering from neurological diseases. Patients suffering from disturbed speech-communicative functions following acquired brain lesions find it extremely difficult to obtain adequate rehabilitation and after-care services. After in- or outpatient neurorehabilitation for some weeks further treatment stops in most cases. As it is known that the recovery after cerebrovascular diseases or brain damage lasts up to five years, a big chance for improving disabilities is lost. Computer-aided treatment in a telecare-setting seems to be a promising alternative. A telecare setting decreases costs and guarantees high treatment intensity.
Concept In view of this an IT-media-supported solution is being developed at present at Fachklinik Herzogenaurach. In cooperation with Dr.-Hein-GmbH Nürnberg speech therapists and physicians developed a special training software for computer-aided aphasia therapy. Therapists and patients are connected via a client/server architecture. Apart from high security of data transfer this setting offers continuous statistical documentation of patients' exercising. Independently from daily organization of both parties, therapists evaluate the treatment progress of their patients and prescribe new treatment units via data transfer.
Preliminary results Initial pilot studies relating to the use of teletherapy in the case of aphasics indicate that this form of therapy is an effective way of supplementing and intensifying the conventional face-to-face-method. In addition to providing high quality of therapy, this method offers patients a greater degree of independence and enhances their self-esteem.

P 1125

133 inpatients with "Frühreha"-Barthel Index between – 125 and 20 points and their outcome

C. E. Haider, M. Reiter
Rehabilitation Centre Großgmain, Großgmain, AUSTRIA

Introduction Measurement of functional recovery and compensatory strategies are essential for clinical management and rehabilitation research.
Method 42 inpatient-beds, multiprofessional team including physiotherapy, occupational and logopedic therapy, psychological and neuropsychological treatment and 24-hours Bobath nursing. Patients treated according to the principles of Bobath, cognitive therapeutic exercises, PNF, speech and swallowing therapy, neuropsychological and psychotherapeutic treatment. Methods / parameters: Frühreha – Barthel Index (FRBI): conventional 100 points version (described 1965 by Mahoney et al), minus 25 points for each of the following symptoms: tracheostomy with need of suction, confusion / behavioural / swallowing disorder gaining intensive observation, severe aphasic/anarthric problems.
National Institute of Health Stroke Scale (NIH-SS), Rivermead Motor Assessment (RMA), Basic and Extended Activities of Daily Living (BADL, EADL), residence after discharge.
Statistics: values expressed as median / range at admission (A) and discharge (D).
Results Patient characteristics: 133 patients, median age 61 years, disability caused by ischemic stroke, intracerebral haemorrhage, traumatic brain injury, hypoxic-toxic encephalopathy. Median length of stay 42 days.
FRBI (A) –10/(D) 10 ns; NIH-SS (A) 11 /(D) 10 ns; RMA (A) 5/ (D) 11 s; BADL (A) 3.5/(D) 5.5 ns; EADL (A) 2/(D) 4 ns. 65% of patients were discharged home, 20% to hospital and 15% to nursing home.
Conclusion FRBI is useful in defining the special problems in early neurorehabilitation (swallowing disorders, nutrition problems, tracheostomy, aphasia/anarthria, severe organic syndrome) and patient's progress. It also may help to argue about high costs in this phase (diagnostic methods, technical monitoring, expensive drug therapy e.g. antibiotics, number of staff members).

P 1126

Emotional self-assessment of stroke patients

B. Stocker[1], M. Gull[2], H. Zauner[1], C. Haider[1], J. Langle[1], P. Duncan[2], A. Gassner[1]
[1]*Neurorehabilitation Centre Grossgmain, AUSTRIA*
[2]*University of Kansas Medical Centre, Kansas, USA*

Objective Mild stroke patients recorded at beginning and 5 weeks after neurorehabilitation with Stroke-Impact-Scale (SIS 3.0 Austrian version) covering the WHO model of impairment, disabilities and handicap on 8 domains by self-assessment. We investigated the accordance between SIS domains emotion, stroke recovery scale and HADS by comparing measurements at two times. The level of disability was tested: Rivermead Motor Assessment (RMA), Barthel-Index (BI), Extended Activities of Daily Living (E-ADL), Nine-Hole-Peg Test (NHPT).
Method 69 consecutive stroke inpatients, Barthel Index >70, minimum 4 weeks at home in familiar surrounding, no aphasia or amnesia. 2 groups A (n=50) deficit in RMA, ADL or NHPT, B (n=19) maximum score in all scales. Comparing A and B to SIS emotion, Stroke recovery scale and HADS-depression and HADS-anxiety at beginning and 4 weeks after rehabilitation. Statistics: Mann-Whitney-U-test
Results No significant difference: emos 1 (0.814) emos 2 (0.946), HADS A1 (0.339)
HADS D1/D2 (0.641/0.953)
Significant differences in Stroke-recovery-scale (0.026/0.018) and HADS-anxiety (0.017).
Mean (SD): Age 60.1 (11.2), duration of stay 28 (3.4) days time since onset 258 days, male 42, female 27.
Conclusion The result of HADS-A2 indicates that emotions are independent of physical state. Even mild strokes, no physical deficits have a negative effect on emotional state at the beginning and even more when patients are back home.

P 1127

Early predictors of post-concussion symptoms in patients with mild head injury

O. J. Savola, M. E. Hillbom
Department of Neurology, Oulu University Hospital, Oulu, FINLAND

Introduction A small proportion of patients with mild head injury develop post-concussion symptoms (PCS). PCS can last over a year, and significantly impair return to work and psychosocial functioning. There is no clinically applicable easy method for identifying these patients already in the emergency room. We searched simple measures for the early detection of patients who will develop PCS.
Method We recorded signs and symptoms, history of previous diseases, medications, lifestyle factors and measured serum protein S-100B on admission in 164 consecutive patients with mild head injury (MHI) admitted to the emergency room of a general hospital. A modified Rivermead Post Concussion Symptoms Questionnaire was used to identify patients with and without PCS one month after the injury. We identified 32 patients with MHI who developed PCS (20%). Odds ratios (OR) and 95% confidence intervals (CI) after adjustment for possible confounding variables were calculated by logistic regression.
Results Independent early risk factors for PCS in the MHI patients were serum protein S-100B≥0.50m g/l (OR 10.8, 95% CI 2.6–44.5), skull fracture (OR 9.2, 95% CI 2.5–33.3), dizzi-ness (OR 4.6, 95% CI 1.6–13.4) and headache (OR 3.0, 95% CI 1.1–8.2). Serum protein S-100B proved to be a specific, but not sensitive predictor of PCS.
Conclusion The presence of elevated serum protein S-100B, skull fracture, dizziness and headache may help the emergency room physician to identify patients at risk of PCS and to guide them for further examination and follow-up.

P 1128

Continuous measurements of cerebral tissue oxygen pressure during hyperbaric oxygenation (HBO) – HBO effects on brain oedema and necrosis after severe brain trauma in rabbits.

A. Niklas[1], D. Brock[2], R. Schober[3], D. Clark[1], A. Schulz[1], D. Schneider[1]
[1]*University of Leipzig, Department of Neurology, Leipzig, GERMANY,* [2]*Praxisklinik am Johannisplatz, Leipzig, GERMANY,* [3]*University of Leipzig, Department of Neuropathology, Leipzig, GERMANY*

Introduction Severe brain injury is one of the most frequent causes of severe disability in the young. In acute management of brain trauma, new approaches should be sought.
Method All male, juvenile Chinchilla-Bastard rabbits received standardized cold-injury-induced-brain-trauma (CIBT). A metal probe (diameter 6mm, weight 230g, temperature –196°C) was

applied epidurally over 10s.The HBO-group (n=10) underwent 90 minute HBO-sessions with 100% oxygen at 2.5 bar (1h, 24h±2h, 48h±2h after CIBT). Cerebral tissue pO2-measurements were performed during the three HBO-sessions and on day 4. The control-group (n=10) underwent no treatment. pO2 was measured 60 minutes after CIBT and on day 2, 3 and 4. Animals were sacrificed on day 4 and brains were analysed histologically.

Results In the HBO-group pO2-measurements showed a significant increase in pO2 between day 1 and day 4 (p=0.005), whereas no significant changes were observed in the control group (p=0.363). pO2-measurements showed a significant increase after consecutive HBO-sessions (p=0.047, p=0.005). During the first HBO-session mean pO2 was 169 mmHg, during the second 305 mmHg and during the third 420 mmHg. In the HBO-group mean area of necrosis was 16.2 mm2, in the control-group 19.9 mm2 respectively. There was no significant difference (p=0.146). Significantly smaller areas of brain oedema were found in the HBO-group (p=0.004). In the HBO-group mortality was 0%, in the control-group 20%.

Conclusion The positive effects of HBO-treatment should be examined in further studies to define the number of HBO-sessions needed and the elapsed time between trauma and first HBO-treatment which might still have beneficial effects.

P 1129

Terminology of mild traumatic brain injury, results of a survey in Austria 2000

C. Stepan
Neurological Department, Otto Wagner Hospital, Vienna, AUSTRIA

Introduction In the year 2000, an inquiry about mild traumatic brain injury was conducted in neurological, neurosurgical and traumatological departments in Austria. The aim was to get more information about terminology, the use of additional examinations and the treatment programmes in patients with mild traumatic brain injury.

Method A questionnaire based on a European questionnaire, presented by J.D. Krujik at the 4th EFNS Congress in Seville 1998, was used. 105 departments were contacted.

Results The return rate was 65%. The most frequently used term was commotio cerebri, "Gehirnerschütterung" (more than 90%). Only 5% of the hospitals used mild traumatic brain injury. The main symptoms are retrograde amnesia (88%), loss of consciousness (86%) and posttraumatic amnesia 82%. 73% of the departments used their own guidelines for diagnosis and treatment. Only 10% answered the question about guidelines in treatment programmes. The duration of hospitalisation ranges from outpatient examination to 48h of patient observation.

Conclusion Commotio cerebri is the most widely used diagnosis in Austria. There is no common therapeutic concept in the different units admitting patients with mild traumatic brain injury. The results of this questionnaire show the necessity for international harmonisation of diagnosis and treatment of patients with mild traumatic brain injury.

P 1130

Different remission stages of transient apallic syndrome (Innsbruck remission scale)

G. Birbamer[1], F. Gerstenbrand[2]
[1]Klinik Angermühle, Deggendorf, GERMANY, [2]Ludwig Boltzmann Institute for Restorative Neurology, Vienna, AUSTRIA

Objective Apallic syndrome is one of the severest neurological diseases. Due to improvements in neurological rehabilitation, most cases can be treated successfully. The course of apallic syndrome is characterized by an initial stage after acute coma, followed by a transitory stage, full stage and a remission stage in 80% of patients. The clinical symptomatology of the full stage of apallic syndrome may be transient in many patients and eight different stages of remission can be differentiated (Innsbruck remission scale). In the last 4 decades Gerstenbrand and co-workers observed more than 1500 patients with apallic syndrome. The aim of this paper is to present the clinical picture of the different remission stages of apallic syndrome, to improve a better understanding of the clinical course and management of this kind of patients.

P 1131

Optimisation factors of cranioplasty in patients after severe head injury

Z. A. Mirzadjanova, M. Mirzabaev
Republican Scientific Center of Neurosurgery, Tashkent, UZBEKISTAN

Introduction Cranioplasty is an important part of rehabilitation of patients after severe craniocerebral trauma. The clinical signs of short-term and long-term outcomes of head injury connected with skull defects are shown by headaches, gravity, seizures, mental disorders, nervous-emotional strain. The indications for cranioplasty after decompressive craniotomy are cosmetic repair, and, mainly, restoration of cerebral protection. The main reason for neurological improvement is the improvement of cerebral blood flow, both arterial and venous.

Method We investigated cerebral hemodynamic changes (arterial and venous) by Transcranial Doppler (TCD) in 32 patients with posttraumatic skull defects in various terms after head injury.

Results The analysis of TCD data up to cranioplasty has shown a decrease of blood flow velocity (BFV) in one or two arteries on defeat area in all patients. A more pronounced decrease of flow velocity was found at a large defect. We revealed increasing of BFV up to 57–64 sm/sec in straight sinus in 25 patients. Small skull defects had no changes in venous blood flow. Long-term investigation (within 2 years) has shown improvement of cerebral circulation – decrease or disappearance of arterial blood flow asymmetry and decrease of BFV in straight sinus within 3–6 months in 19 patients, who underwent cranioplasty up to 6 months after head injury. TCD data correlated with neurological improvement. 13 patients, who underwent cranioplasty a long period after craniocerebral trauma, showed no marked disappearance of BFV asymmetry. Thus, early cranioplasty lead to faster restoration of cerebral blood flow, better functional recovery and rehabilitation of these patients.

P 1132

Time interval of oral feeding recovery as a prognostic factor in severe traumatic brain injury

R. Formisano[1], R. D. Voogt[2], V. Vinicola[1], F. Penta[1], P. Stanzione[1,3], A. Peppe[1,3]
[1]I.R.C.C.S. Santa Lucia, Rome, ITALY, [2]Robert Voogt and Associates, Virginia Beach, VA, [3]Neurological Clinic, University "Tor Vergate", Rome, ITALY

Introduction Survivors from severe traumatic brain injury often show prolonged coma followed by different clinical outcome. Age, severity and duration of coma, duration of post-traumatic amnesia, site and extension of the cerebral lesions and finally the association with polytrauma and hypoxia have been considered as the main prognostic factors (1,2,3). The aim of this study was to evaluate the correlation of some clinical features with final outcome of patients with severe brain injury.
Method We retrospectively examined 43 patients, 31 male, 12 female, with a mean age of 25.6±11.3, who sustained severe traumatic brain injury and prolonged coma, in order to evaluate if certain clinical prognostic factors can predict the final outcome.
Results A statistically significant correlation with both Glasgow Outcome Scale and Barthel Index was found for the time interval from brain injury to the recovery of the following clinical variables: optical fixation, ability to follow commands, spontaneous motor activity and first oral feeding. Psychomotor agitation and bulimia were also favourable prognostic factors for the final outcome.
Conclusion The significant correlation between outcome and clinical signs of recovery such as oral feeding and following commands, demonstrates the importance of the duration of unconsciousness with final outcome. Spontaneous motor activity played a positive prognostic role. The significant correlation between first oral feeding and outcome seems to confirm that a valid deglutition may be possible only after some recovery of cognitive function.

P 1133

Concomitant alcohol intoxication in patients with mild traumatic brain injury: a double effect

U. Luchanok, Y. Alekseenko
Vitebsk Medical University, Vitebsk, BELARUS

Introduction The diagnosis of mild traumatic brain injury (MBI) with concomitant alcohol intoxication (AI) is usually a challenge. We analysed the influence of mild and moderate AI on the neurophysiological mechanisms of MBI and its main clinical features.
Method This study embraces 91 males with MBI (aged 16–39). In 61 patients an accident took place on the background of mild and moderate AI (MBI+AI). The quantitative analysis (duration/intensity) of main symptoms was carried out. P300 event-related potentials were studied in the first 2–4 and in the following 8–10 days after the trauma.
Results MBI+AI patients demonstrated more extensive disorders of consciousness and more frequent traumatic amnesia (88%), especially anterograde amnesia (67%) in comparison with MBI patients without AI. At the same time MBI+AI patients demonstrated a relatively favourable recovery from subjective symptoms of autonomic dysfunction and headache (5.4±2.8 vs. 6.6±2.8 days; $p<0.05$) after the trauma. The P300 amplitude was significantly reduced and P300 latency was increased ($p<0.01$) in MBI patients without AI versus that in controls during at least two weeks. In MBI+AI patients we observed only insignificant and short-term increase of P300 latency.
Conclusion Concomitant mild and moderate AI in MBI patients is associated with more frequent amnesia and therefore complicates the diagnosis of trauma. But amnesia itself is a valuable diagnostic criterion of MBI in such cases. AI seems to decrease the "concussion threshold" simultaneously producing some neuroprotective influence on brain mechanisms and contributing to patients' recovery after the trauma.

P 1134

Posttraumatic survival of L4 – L5 spinal ganglia neurons under traction load on the central segment of rat's sciatic nerve

Y. A. Chelyshev[1], A. A. Bogov[2], R. F. Masgutov[1]
[1]Kazan State Medical University, Kazan, RUSSIAN FEDERATION, [2]Tatarstan research centre Restoration traumatology and orthopaedics, Kazan, RUSSIAN FEDERATION

Objective Investigation of the effect of peripheral nerve intraoperative traction on the number of surviving sensory neurons of the spinal ganglia.
Method The experiment was carried out on 21 rats, weighing 200–300 gr. Ligature was applied to the proximal fragment of the sciatic nerve of the left extremity in the animals of the test group and traction by different loads was performed. Depending on the load used the animals were divided into groups: The first group included animals with 100 gram traction load, the second group with 120 gram, the third one – with 150 gram. The rats of the fourth group were subjected to nerve cutting, the later being sutured without traction. Then the nerve was sutured by nine epiperineural stitches 10/0 using microsurgical technique. On the 30th postoperative day spinal ganglia on the level L4 – L5 were exposed on the operative side. The material was fixed in 10% neutral formalin, drained and embedded into paraffin. L4 – L5 spinal ganglia of the intact rats served as controls.
Results On the 30th day of the experiment significant decrease of the number of sensory neurons compared with intact animals was observed in all treated groups. 45.3% of neurons in the first group, 53.3% in the second group, 21.8% in the third one and 13.2% ($P<0.05$) in the fourth group. Thus the results obtained demonstrate that the loads of 100 gram and 120 gram are the most suitable and the least traumatic for the nerve.

P 1135

ADL, anxiety and depression following spinal cord injury – preliminary report

J. Opara[1,2], B. Grabarczyk[2], D. Gustowski[2], M. Sklorz[2]
[1]Politechnika Opolska, Opole, POLAND, [2]"Repty" Rehab Centre, Tarnowskie Gory, POLAND

Objective Spinal cord injuries often have an impact on patients' further life. In the early period after trauma there are many medical problems, later on one can observe the decrease of quality of life. This preliminary report presents the situation of persons after SCI. Functional status (ADL) and psychological implications of spinal injury were evaluated.
Method In this study, 60 consecutive paraplegic patients, who underwent rehabilitation after spinal cord injury were assessed. They were examined at least one year after injury. In assessing Activities of Daily Living, the Functional Index "Repty" (FIR) which is a simplification of Functional Independence Measure

was used. Anxiety and depression were evaluated using Hospital Anxiety and Depression Scale (Zigmund & Smith, 1983).
Results The correlation between independence in Activities of Daily Living and anxiety/depression were calculated.
Conclusion Statistical calculations showed a poor correlation between independence in Activities of Daily Living measured by FIR and anxiety / depression measured by HADS.
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P 1136

Bio-resonant therapy in neurological rehabilitation of patients with cervical osteochondrosis (CO)

L. V. Usatcheva, Y. I. Kravtsov, G. I. Devyatkova
Perm State Medical Academy, Perm, RUSSIAN FEDERATION

Our method of treatment and prophylaxis of CO by influencing biologically active points of the body (BAP) using patient's personal wave oscillations created by the software complex "IMEDIS-FOLL" was used in the process of complex treatment of 142 patients, (priority ref. number 2001104774 dated 20. 02. 2001). The general patterns testifying the direct clinical pathophysiological dysfunctions of neuromuscular and hemodynamic regulations were revealed as a result of our electrophysiological study of BAP, electromyography and transcranial Doppler sonography. The decrease of average linear blood flow speed in the middle cerebral and vertebral arteries; the increase of excitability limit and the decrease of the impulse speed conducting: n. medianus, n. ulnaris; indexes of electrophysiological research of BAP on meridians of nerve and articular degeneration, especially in critical algesic syndrome, predominated. Bioresonant therapy (BT) and proposed electro-pharmaceutical spectrums of oscillations (EPSO) possessing the resonant properties, analgesic and prolonged effect, promote the prophylaxis of cervical osteochondrosis exacerbation and more rapid medical effect due to the increase of adaptation-compensational systems of the organism. Effectiveness of the treatment is up to 85%.

P 1137

The problem of clinical assessment of patients with persistent vegetative state/ apallic syndrome represented by rehabilitation-score

C. Stepan
Neurological Department, Otto Wagner Hospital, Vienna, AUSTRIA

Introduction Making a selection of scores for rehabilitation, which are appropriate to register minimal changes in the state of patients with persistent vegetative state/ apallic syndrome (PVS/AS) turns out to be very difficult.
Method Looking for special scoring systems, a Medline ® - search was initiated in July 2000. The following scores were found in the list of entries, in order of frequency: Glasgow Coma Scale, Glasgow Outcome Score, Edinburgh 2 Coma Scale, Innsbruck Coma Scale, Rancho Los Amigos Scale, Rancho Los Amigos Cognitive Scale and the Koma Remissions Skala.
The scales mentioned were compared concerning sensitivity and specific use in patients with PVS/AS of different aetiology.
Results Most of the scales showed too little sensitivity in this group of patients. Some of the scores did not reflect the positive development of the clinical course, others included changes in a fragmentary form.
Conclusion The measurement of patients with PVS/AS makes great demand upon the documentation. Due to the integral approach one has to consider a large spectrum of symptoms and individual changes. This leads to the problem of neglecting some items out of a lack of time.
In addition most of the scores were developed for diseases and not for syndromes like PVS/AS. Out of this situation it is necessary to use a combination of different scores to assess patients with PVS/AS.

P 1138

Application of scalp pharmoco-puncture in rehabilitation after stroke

E. V. Lukyanyuk, V. M. Shklovsky
Moscow Neurorehabilitation Center, Moscow, RUSSIAN FEDERATION

Introduction Scalp acupuncture has been successfully applied in Russia both at acute and rehabilitation stages after stroke since 90ies. The use of medicines in the points of acupuncture gives another impulse in this field: apart from reflective stimulation of cerebral cortex trophic action on head tissues and through veins on soft of the cerebrum is conducted.
Method For 4 years we have been observing 93 patients aging from 45 to 65 with left-side hemisphere impairment and evident higher mental disorders including speech as well as motor disorders (different degree paresis of the right leg or arm). The main group (60 patients) was subject to pharmoco-puncture with Cerebrolysin (EBEWE Pharmaceuticals Ltd., Austria) along motor and speech zones of the scalp in the area of focus. In addition neck-collar and cranio-vertebral points were under application. Treatment comprised 10 sessions daily. Control group (33 patients) received standard neurorehabilitation. Neurological and neuropsychological state of all patients was under dynamic control and EEG mapping.
Results The results of neurorehabilitation were significantly higher among the main group. This was expressed in higher rates of speech and motor functions restoration. Clinical efficiency was supported by neuropsychological testing and by EEG mapping (evident decrease in the power of the slow wave focus and better cortical rhythm organization).
Conclusion Application of pharmoco-puncture with Cerebrolysin in the zones of the scalp in patients after stroke essentially raises efficiency of complex neurorehabilitation.

P 1139

The concept of neurorehabilitation in patients after stroke or brain injury with higher mental disorders

V. M. Shklovsky
Moscow Neurorehabilitation Center, Moscow, RUSSIAN FEDERATION

Introduction More than 40% of patients after stroke or brain injury demonstrate speech, other higher mental disorders (HMD) and the right side hemiparesis.
Method More than 400 patients from 4.5 to 70 years old have been observed in the recent years, among them men – 82%, women – 18%. All of them suffered from HMD and passed through stage-by-stage rehabilitation at Moscow Neurorehabilitation Center. Principles of neurorehabilitation: 1. Launching rehabilitation at the earliest stages; 2. consistency and regularity; 3. intensity; 4. duration; 5. combination of medical, phy-

siological and teaching measures; differential and syndrome diagnostics; 7. adequate and differential training schemes in compliance with the form and stage of disease; 8. system control over somatic, neurological and psychological state (functional diagnostics and neuropsychological testing); 9. forecast of efficient application of various neurorehabilitation forms; 10. solution of social, psychological, day-to-day and labour problems; 11. family involvement at all stages. Consistent and stage-by-stage neurorehabilitation is available at acute neurosurgical, neurological and day-care departments of Moscow Rehabilitation Center, at in-home clinics and at local day-care clinics.

Result Estimation of efficient neurorehabilitation was based on the data obtained with paraclinical methods and neuropsychological testing; 17% of patients returned to their jobs, 20% to easier jobs; thus 35 – 40% of patients managed to reach essential positive dynamics in their state and practically restore higher mental and motor functions; and this is much higher than at an ordinary neurological hospital. Establishment of specialized neurorehabilitation centres is only appropriate everywhere.

P 1140

Shoulder pain syndrome in neurorehabilitation of hemiplegic patients

S. Ciobanu, O. Pascal, E. Cibotaru
Clinical Research Center in Neurology and Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA

Introduction Shoulder pain syndrome (SPS) is a burning issue in the neurorehabilitation of hemiplegic patients. According to literature data, SPS occurs in almost 70% of stroke patients admitted during the first year after stroke onset (Van Ouwenaller, 1986). This study aimed at prospectively assessing SPS in hemiplegic patients admitted to the Neurorehabilitation Center of the Republic of Moldova throughout 2001.

Method 643 patients with hemiplegic syndrome were treated in our hospital in 2001. This study found that 287 (44.63%) of above cases presented with pain in the shoulder area, 193 cases associated with left side hemiplegia and 94 cases of right side hemiplegia.

Results The highest percentage of SPS cases was registered in the age group above 60 (79%). In 492 of cases hemiplegia was stroke-related (137 – haemorrhage and 285 – ischemic; in 99 cases – due to CNS trauma; in 33 cases – owing to perinatal conditions, in 12 cases – suffered from CNS tumours (with further surgery) and in 7 cases – CNS inflammatory conditions.

Conclusion Hemiplegic patients developing SPS prone to have a longer hospital recovery period and a poorer functional outcome than those without SPS. This leads to an increase in spasticity and emergence of contractures. A higher incidence of SPS in left-side hemiplegia might be suggestive of the importance of right cerebral hemisphere impairment in developing shoulder pain. Despite an impressive number of hypotheses explaining the cause of SPS, with subsequent prevention and treatment of SPS, the management of SPS still needs improvement.

P 1141

Silent deep vein thrombosis (DVT) in a population of rehabilitation patients: D-dimer test as an early predictive index

R. Formisano, L. Di Lorenzo, D. Rinnenburger, D. Morelli, A. Pompa, P. Cicinelli, A. Terziani
Fondazione S.Lucia Rehabilitation Hospital, Rome, ITALY

Introduction D-dimer, a product of fibrinolysis, is elevated in venous thromboembolism; therefore the D-dimer test is a blood test with high sensitivity and high negative predictive value for DVT. The clinical diagnosis of DVT is unreliable, whereas ultrasonography is sensitive and specific for the diagnosis of proximal, occlusive venous thrombosis. The majority of thrombi in asymptomatic high-risk patients are in the calf veins and are often non -occlusive. Early diagnosis and treatment of proximal DVT are essential in preventing pulmonary embolism (PE) reducing the risk of recurrent DVT. Risk factors in rehabilitation patients include: age >40 years, recent major surgery, immobility, bed rest >3 days, intensive care, history of recent trauma or surgery, especially of pelvis or limbs, plaster immobilization and associated medical conditions such as cardiac disorders. Rehabilitation patients share more than 2 of previous risk factors.

Method We performed D-dimer tests in a population of rehabilitation patients with possible clinical diagnosis of DVT and then compared the results with the aetiology of the immobilization and the ultrasonographic data.

Results We confirmed the high sensitivity and high negative value for DVT in stroke and brain-injured patients but not in orthopaedic ones. In the majority of patients with joint prosthesis we found statistically significant higher false positive results compared with the other two populations.

P 1142

Comparative outcomes following plating or tension band wiring of olecranon fractures

N. Aslam, S. Nair, G. Ampat, K. Willet
John Radcliffe Hospital, Oxford, UNITED KINGDOM

Objective To evaluate the outcome following internal fixation of olecranon fractures using the techniques of tension band wiring and plating.

Method Retrospective evaluation; Regional trauma centre
Forty-eight consecutive patients with fractures of the olecranon were treated over a twenty month period (May 1993 to December 1994). Analysis of the results were based on the medical records, pre-operative and post-operative radiographs of all forty eight patients and clinical review of thirty nine patients at a mean follow up of more than two years (range 28 – 48 months).

Intervention Twenty-five fractures were fixed using the AO tension band wiring technique and twenty-three were fixed with a plate; the selection of method was based on agreed radiological fracture pattern criteria.

Main outcome measurements Radiographic evaluation of the quality of reduction was carried out using a grading system. Clinical outcome was assessed using the Broberg and Morrey functional rating index.

Results Clinical evaluation of thirty-nine patients was carried out. In the tension band wiring group seventeen (85 percent) patients had an excellent or good outcome and eleven (55 percent) patients underwent a second procedure for symptomatic metalwork. In the plating group sixteen (84 percent) patients had an excellent or good outcome and two (11 percent) patients underwent a second procedure for symptomatic metalwork. The latter group had more complex and associated fractures and included the only poor result.

Conclusion Internal fixation of fracture of the olecranon results in good functional outcome. Fixation with a plate is effective for olecranon fractures with an associated fracture or dislocation, a fracture line distal to the coronoid process, an oblique fracture

or fracture comminution. Patients who have tension band wiring more often require a second procedure for removal of symptomatic metalwork.

P 1143

The effect of baseball pitching injuries on ulnar nerve conduction velocity

Y. Chang[1], S. Wei[2], R. K. Shields[3], Y. Jong[4]
[1]Chang Gung University, Tao-Yuan, TAIWAN REPUBLIC OF CHINA, [2]Yang Ming University, Taipei, TAIWAN REPUBLIC OF CHINA, [3]The University of Iowa, Iowa City, IA, USA, [4]Da-Yeh University, Changhua, TAIWAN REPUBLIC OF CHINA

Objective The purpose of this study was to compare the ulnar nerve conduction velocity of baseball pitchers without injury to baseball pitchers with injury and to individuals who do not play baseball.
Method Eight college baseball pitchers without injury, 8 age-matched individuals that do not play baseball, and 8 college baseball pitchers with elbow injury participated in the study. Supra-maximal electrical stimulation was applied superficially to the ulnar nerve of both the dominant and non-dominant arms of all subjects. M-waves were recorded from the abductor digiti minimi muscles. The ulnar NCV of both arms of the 3 groups were compared using a 2x3 analysis of variance. Alpha levels of 0.05 were used to test for significance.
Results The ulnar NCV were 64.40m/s(sd=7.34), 54.97m/s(sd=8.67), and 59.18m/s(sd=4.10) for the pitchers without injury, pitchers with injury, and the individuals that were not pitchers, respectively. The pitchers without injury were significantly faster than the other two groups. In pitchers without injury the ulnar NCVs of their dominant arms were significantly faster than their non- dominant arms 56.26m/s(sd=2.63). No significant difference was found between the dominant and non-dominant arms for the group of injured pitchers and the group of individuals that were not pitchers.
Conclusion The above normal NCV observed in the non-injured pitchers may be an adaptative response to trauma associated with ball throwing. The sub-optimal NCVs observed in injured pitchers may be associated with less than optimal pitching performance. We suggest that the rehabilitation program consider monitoring ulnar NCV to establish their ability to predict outcomes.

P 1144

Neurological and psychosomatic disorders of medical personnel of "critical" specialties in socially stressful conditions with poor professional adaptation

T. Z. Biktimiriv, D. G. Semenikhin, K. T. Biktimirova
Ulyanovsk State University, Ulyanovsk, RUSSIAN FEDERATION

Objective Study of psychological adaptation disorders that doctors of "critical" specialties (surgeons, oncologists, psychiatrists, etc.) and medical personnel have, are actual problems of health care.
Method Modern clinical experimental-psychological, socio-psychodiagnostic methods of psychosomatic (neurological) disorders, personality features and their changes depend upon the influence of social-stressful factors and professional hazards. Detection of personal and professional lack of adaptation and copying-behaviour were used. 46 oncologists, 102 psychiatrists, 64 paramedical workers of oncological institutions and hospices, 26 therapeutic nurses were among the persons examined. Average age of oncologists and nurses of oncological institutions was 41.7 and 34.3, respectively; psychiatrists and nurses - 46.1 and 32.3. Among oncologists there were 54.3% men, 45.7% women; among psychiatrists 39% and 61%, respectively. We studies the appearance of neurological and psychological disorders, personality changes and structure, changes in the emotional sphere depending upon intensity and level of acute and chronic stress; traits of social-psychological and professional stressful factors leading to psychological maladaptation of doctors and medical personnel.
Results Both correlative and non-correlative peculiarities of individually typical features of oncologists and psychiatrists in the types of reactions and emotional disorders of paramedical personnel were detected. Professional and social-stressful factors contribute to forming psychological maladaptation and non-adequate psychological protections of doctors and personnel of "critical" specialties causing psychosomatic disorder and "difficult" conditions, to which dynamic states due to stress are related, neurotic and somatically forming disorders connected with them, and other disturbing disorders. The study of these problems will promote timely detection of psychosomatic disorders, development of complex clinico-psychological, socio-cultural psychotherapeutic programmes of rehabilitation of doctors and of the personnel of "critical" specialties.

P 1145

A biomechanical examination of brain dynamics as a result of a minor impact

M. Ziejewski
North Dakota State University, Fargo, ND, USA

P 1146

Cerebral metabolism of glucose in patients with apallic syndrome due to clinical course

C. Stepan
Neurological Department, Otto Wagner Hospital, Vienna, AUSTRIA

P 1147

Headache and EEG changes in assessment of patients' recovery after mild traumatic brain injury

I. Lukomski, U. Luchanok, Y. Alekseenko
Vitebsk Medical University, Vitebsk, BELARUS

P 1148

Closed head injury – frequency and character of brain lesions

R. R. Raicevic[1], L. Markovic[2], A. Radosavljevic[2], T. Lepic[1], N. Rajsic[1], S. Petkovic[1]
[1]Department of Neurology, [2]Department of Radiology, Military Medical Academy, Belgrade, YUGOSLAVIA

P 1149

New classification of severe brain injury

G. Birbamer[1], F. Gerstenbrand[2]
[1]Klinik Angermühle, Deggendorf, GERMANY, [2]Ludwig Boltzmann Institute for Restorative Neurology, Vienna, AUSTRIA

P 1150

Pelotherapy in immunologic rehabilitation ofpatients with diabetic polyneuropathy

A. V. Musayev, L. G. Kalinichenko, U. S. Kerimbeyli
Research Institute of Medical Rehabilitation, Baku, AZERBAIJAN

P 1151

Painful torticollis unresponsive to botulinum toxin following thyroidectomy

M. Monteiro, P. Abreu, M. J. Rosas, J. Correia
Hospital S. João, Porto, PORTUGAL

P 1152

The Klüver Bucy syndrome in the remission of traumatic apallic syndrome – a positive prognostic feature

B. Matulla, F. Gerstenbrand, C. Stepan, H. Binder
Ludwig Boltzmann Institute for Restorative Neurology, Neurological Department, Otto Wagner Hospital, Vienna, AUSTRIA

P 1153

Cancelled

P 1154

The state of immune homeostasis in patients with gunshot injuries of peripheral nerves

S. Huseynova
Research Institute of Medical Rehabilitation, Baki, AZERBAIJAN

Child neurology
Sleep disorders

P 1155

Ascorbic acid and gluthathione CSF concentration in newborns with bacterial meningitis

M. T. E. S. Lukavac
Institute for Neonatology, Belgrade, YUGOSLAVIA

Introduction Pathophysiological mechanisms of meningeal inflammations are very complex. Free oxygen radicals play an important role. Non-enzymatic antioxidants are also important for prognosis of illness. Two of them are ascorbic acid and gluthathione.
Objective We tested the hypothesis that ascorbic acid and gluthathione are important non-enzymatic protective factors.
Methods We tested CSF and blood serum of 32 newborns with bacterial meningitis in the first seven days of illness. We used a method with 2.4 dynithrophenil-hydrasine for ascorbic acid and a method with Elmans substance for gluthathione. We formed control groups of newborns with high risk for bacterial meningitis.
Results The mean value of CSF ascorbate concentration in groups of sick newborns is 112.93uM/L and in control, group's 102.79uM/L. There is no statistical difference. Dehydroascorbate concentration in CSF is 75.42uM/L and in control group 75.10/L, $p>0.05$. Blood serum concentration of ascorbic is 161.00-ump/L in the group of sick newborns and 128/L in the control group<0.05.
But ascorbat/dehydroaskorbat ratio (which is constant) shows statistical important changes between two groups. There is no statistical significance in correlation between concentration of ascorbic acid with protheinorachy and numbers of leukocytes. Mean CSF concentration of gluthathione is 13.37uM/L in groups of sick newborns and 14.50uM/l in control groups. There is no statistical correlation between protheinorachy, and number of leukocytes with gluthatione concentration.
Conclusion Ascorbic acid and gluthathione are not important antioxidant protectors in early stages of neonatal bacterial meningitis. Change in ascorbat/dehydroascorbat ratio shows that dynamic has been changed but that only as reparative protectors they maybe more important in another stage of illness.

P 1156

Arnold-Chiari malformation, the character of epileptic seizures, particular features of EEG

O. I. Pavlova[1], S. G. Pantuchov[2], O. A. Kuznetsova[2]
[1]St-Petersburg Paediatric Medical Academy, St-Petersburg, RUSSIAN FEDERATION, [2]Pediatric Medical Academy, St-Petersburg, RUSSIAN FEDERATION

Introduction Arnold-Chiari malformation (ACM) becomes a problem of paediatric neurology because of the increasing frequency in clinical practice.
Methods 28 patients aging from 4 to 13 years have been examined. MRI and MR-angiography proved the diagnosis of ACM.
The first degree of ACM was in 5 cases, the second in 19 and the third in 4 patients. EEG registration was performed. International System 10 – 20 of electrode positioning.
Results On the basis of clinical and physiological data several types of epileptic attacks were detected: simple partial (sensory; with vegeto-visceral manifestation) complex partial, with secondary generalisation.
Particular features of EEG pattern:
1) Basic activity is slow, increasing percentage of slow waves in posterior area;
2) Registration of slow rhythmic waves, tracing more than 10% of registration time in caudal area (there is no reaction to eyes opening);
3) Generalised bilateral paroxysmal activity (polymorphic sharp slow waves, sharp waves).
Conclusions In all groups of patients with frequency of epileptic seizures, the EEG pattern correlated with the degree of ACM.

P 1157

Hypothalamic hamartoma presenting as true precocious puberty and gelastic seizures

M. Monteiro[1], C. Horta[1], J. Reis[2], R. Rangel[2], H. Cardoso[1], B. Serra[1], H. Ramos[1]
[1]Dept. Endocrinology, Hospital Geral Santo Antonio, Porto, PORTUGAL, [2]Dept. Neurosurgery, Hospital Geral Santo Antonio, Porto, PORTUGAL

Hypothalamic hamartomas (HH) are congenital lesions usually located at the floor of the third ventricle, containing LHRH-secreting cells, that can cause true precocious puberty (TPP) and in some cases gelastic seizures.

The authors present the clinical case of a female patient first observed aged 5 years old, presenting with pubertal development and gelastic seizures. The hormonal findings were compatible with central activation of the GnRH pulse generator (LHRH test: basal and post-stimulation LH of 12.4 mUI/ml and 100.89 mUI/ml, respectively). MRI demonstrated a 3 cm isointense hypothalamic lesion with retroclival expansion showing no gadolinium enhancement. EEG and SPECT confirmed temporal hyperactivity. These signs were highly suggestive for the diagnosis of HH, as the cause for TPP and gelastic seizures.
Aged 20 years old, in spite of multiple anti-convulsive therapies, the patient still presented several daily seizures, so that surgical excision of the lesion was performed in an attempt to control the epilepsy. Post-operatively seizures became rare but the patient developed ACTH, TSH and gonadotrophin insufficiency. Three months later, although adrenal and thyroid function recovered she remains with secondary hypogonadism.
Conclusion HH are benign lesions associated with seizures often resistant to anticonvulsive therapy. Neurosurgical treatment presents considerable risk for endocrine and neurological morbidity, although controversy should be considered whenever medical therapy failed and patients present already high morbidity.

P 1158

Cerebrovascular reactivity in migraine in children

A. N. Trubacheva, V. I. Guzeva, M. Y. Sharf
St-Petersburg Paediatric Medical Academy, St-Petersburg, RUSSIAN FEDERATION

Migraine headaches are relatively common, affecting approximately 5% of all children.
Alteration of intracranial vessel tone has been implicated in the pathophysiology of migraine. The cerebrovascular reactivity was measured by means of transcranial Doppler in 45 migraine patients with (15 patients) or without aura during headaches-free intervals and in 50 healthy controls (age 10–16 years). The vasomotor response was evaluated during hypercapnia. Induced by inhalation of a mixture of CO2 5% and O2 95% and during hypocapnia obtained after voluntary hyperventilation. Reactivity index values during CO2 inhalation and during hyperventilation were significantly higher in patients suffering from migraine with aura and without aura.
Our data suggest an increased cerebrovascular reactivity in children suffering from migraine with respect to controls that might be related to baseline disturbance cerebrovascular regulation.

P 1159

Sleep disturbance of affected and at risk individuals from the pallido-ponto nigral degeneration (PPND) family with N279K mutation on chromosome 17 (FTDP-17)

S. Lin, Z. K. Wszolek
Mayo Clinic, Jacksonville, FL, USA

Sleep disturbances are commonly seen in neurodegenerative diseases such as Alzheimer's, Parkinson's disease and multiple system atrophy. PPND is a progressive disorder characterized by papallido-ponto-nigral degeneration. PPND belongs to frontotemporal dementia and parkinsonism linked to chromosome 17 (FTDP-17) and is due to N279k mutation. Cognitive decline and motor symptoms of extrapyramidal dysfunction with paucity of resting tremor occurs in the fifth decade of life. Dementia usually ensues and death can occur within eight years. Clinical manifestation and neuropathological finding of FTDP-17, has been discussed well characterized except for sleep disturbance. We report the polysomnographic findings of five affected subjects and five at risk individual from this family.
Results 1. The two most advanced affected subjects showed severe insomnia. No sleep was achieved by one of them and the other achieved only 43 minute of very disrupted sleep. The other three affected subjects also had difficulty initiating and maintaining sleep.
2. Disordered breathing was not observed in any of the subject, affected or at risk.
3. Periodic leg movement was elevated in the three less affected and one of the at risk subjects.
4. No parasomnia, REM or NREM, was observed.
Discussion Pontine tegmentum, the caudal solitary track nucleus, the preoptic area and basal forebrain, among others, have been implicated in sleep generation. Neuropathological findings of PPND subjects have shown that pontine and mesencephalic tegmentum are areas the most involved. Some of our findings of sleep disturbance in affected subjects correspond with pathological abnormalities seen in this family.

P 1160

Excessive daytime sleepiness and unintended sleep episodes in Parkinson's disease patients treated with dopaminergic agents

L. D. Borchert[1], T. Roth[2], D. L. Bliwise[3], C. Cantor[4], J. M. Gorell[2], J. P. Hubble[5], B. Musch[1], C. Pollak[5], D. B. Rye[3], M. B. Stern[4], R. L. Watts[3]
[1]Pharmacia Corporation, Peapack, NJ, USA, [2]Henry Ford Hospital, Detroit, MI, USA, [3]Wesley Woods Health Center, Atlanta, GA, USA, [4]Pennsylvania Hospital, Philadelphia, PA, USA, [5]Ohio State University, Columbus, OH, USA

Introduction Unintended sleep episodes (SEs) have been reported in Parkinson's disease (PD) patients taking dopamine agonists (DAs)[1]. This observational study was undertaken to determine if patients reporting SEs and taking DAs are sleepy during the day and/or sleepier than PD patients not reporting SEs.
Methods This study includes 24 patients (5 women, 19 men) who received DAs for idiopathic PD and had abnormal Significant Other Epworth Sleepiness Scale (SOESS) scores of $\geq$10. Patients were divided into 2 groups: those with SEs (SE+, n=16) and those without SEs (SE–, n=8). Patients underwent 2 consecutive nights of polysomnography followed by multiple sleep latency testing (MSLT).
Results The overall frequency of pathological sleepiness (MSLT<5) was 42% (10/24). No significant differences between the SE+ and SE– groups in mean level of sleepiness, frequency of pathological sleepiness, frequency of naps with stage 2 sleep, or frequency of REM naps were observed. Interestingly, no correlation was found between level of sleepiness and nocturnal sleep parameters or specific DAs.
Conclusions PD patients with SEs have a history of excessive daytime sleepiness: therefore, SEs are not simply the result of insufficient sleep or the effects of a specific DA. Additional studies are needed to assess contributions of other drug effects, disease progression, and other as yet unidentified factors in the aetiology of SEs among PD patients.
Reference
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P 1161

Sleep abnormalities in neurodegenerative diseases

J. Vankova
1st Medical Faculty Charles University, Prague, CZECH REPUBLIC

Five patients with Niemann-Pick disease, type C (NPC) were included in the study. The clinical diagnosis was confirmed biochemically and by the presence of foam cells on bone marrow. Deterioration of intellectual function, the presence of pyramidal, dystonic and cerebellar features and splenomegaly were observed in all cases. Only one patient reported cataplexy. Nocturnal polysomnography revealed interrupted and disorganized night sleep in all patients. The total sleep time was significantly shortened; sleep efficiency was lowered compared to age-matched controls. A decreased amount of REM and delta sleep was seen in all the patients. Altered sleep patterns included EEG sigma activity connected with rapid eye movements and muscle atonia, atypical K-complexes and spindle activity, and the presence of alpha-delta sleep. All NPC cases exhibited fragmental myoclonus. Shortened mean sleep latency was observed during MSLT, SOREMs were found only in the one case with cataplexy. Human leukocyte antigen typing and CSF hypocretin-1 levels were tested in 4 patients. The patient with cataplexy was HLA DQB1 * 0602 positive, while other subjects were negative. The hypocretin levels were reduced in 2 patients (one with cataplexy), in the remaining 2 patients the levels were at the lower limit of the norm. The mean value of hypocretin level (204.8±39.3pg/ml) in the NPC group was significantly lower than the controls (265.8±48.8 pg/ml). The findings suggest that lysozomal storage affects brain structures including lateral parts of hypothalamus; these changes may be partially responsible for sleep abnormalities and a manifestation of cataplexy in NPC patients.

P 1162

Cancelled

P 1163

The effects of electrical stimulation on the H-reflex, F-response and muscle hypertonus in children with hemiplegic cerebral palsy (CP).

E. Kavlak[1], T. Sahiner[2], U. Cavlak[3]
[1]Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, TURKEY, [2]Pamukkale University School of Medicine Department of Neurology, Denizli, TURKEY, [3]Pamukkale University School of Physical Therapy, Denizli, TURKEY

Introduction This study was planned to search the effects of electrical stimulation on the H-Reflex, F-Response and muscle hypertonus in children with hemiplegic CP.
Methods 16 children (8 boys and 8 girls) who suffered from hemiplegic CP were included in this study. The average of age of the subjects was 6.25±2.89 years. All the subjects were treated with Bobath therapy plus tetanic Faradic stimulation (TFS). TFS was applied on the tibialis anterior muscle, on the affected side. The subjects received TFS during five weeks (four days a week, 20 minutes). The effects of TFS on H- reflex, F and M responses of the m. gastro- soleus on affected side were evaluated using electromyography. Modified Ashworth scale was used so as to evaluate muscle hypertonus.
All the data obtained from this study was calculated using SPSS for WINDOWS' 98 version.
Results At the end of the study, after TFS we observed a decreasing in spasticity according to the modified Ashworth scale ($p<0.001$). In the other hand, there was no significant difference about H- Reflex, F and M responses of the gastro-soleus muscle between affected and unaffected sides ($p>0.05$).
Conclusion The use of TFS in non-spastic muscle (m. tibialis anterior) did not provide any difference H- reflex, F and M responses of the spastic muscle in children with hemiplegic CP.

P 1164

Fixated set in children with various types of tics

S. Natriashvili, G. Natriashvili, N. Geladze
Tbilisi State Medical University, Tbilisi, GEORGIA

The aim of our study was to estimate the role of fixated set in children with various types of tics for revealing the possible correlates with clinical patterns. 90 children from 5 to 15 years were investigated (40 girls, 50 boys). The diagnosis was based on the findings of subtle anamnestic, laboratory, electroencephalographic and cardio logical investigations. In 19 patients, tics were manifested on the background of sub acute rheumatic encephalopathy (rheumatic tics). In 28 patients-on the background of minimal residual dysfunction (organic tics). In 22 cases tics were observed with some kinds of neurotic disturbances – nocturnal enuresis, logo neurosis, phobias, or only tic disorders without any egzogenity (functional tics), 17 children were diagnosed to have obsessive condition with anancastic patterns and tics (neurotic tics), Tourette syndrome was recognised in 9 cases, with coprolalia in 4 cases. (13–15 years old boys).
All patients underwent the psychological test of set fixation by method of D. Uznadze in haptic and visual modalities. We estimated the level of set excitation, extinction and irradiation and the types of set – dynamic, static, variable sets and their subtypes. Then we defined correlations between this or that type of set and various types of tics.
Set fixation presents not only the supplementary high effective method for the diagnosis of various types of tics but it also gives the possibility of prognosing tics tolerance upon the course of disease and treatment.

P 1165

Effectiveness of tetanic faradic stimulation on range of motion and gait parameters in children with hemiplegic cerebral palsy (CP)

E. Kavlak[1], U. Cavlak[1], T. Sahiner[2]
[1]Pamukkale University, School of Physical Therapy and Rehabilitation, Denizli, TURKEY, [2]Pamukkale University School of Medicine Department of Neurology, Denizli, TURKEY

Introduction The aim of this study was to investigate the effects of electrical stimulation in non-spastic muscle (M. Tibialis Anterior) on spastic Gastro-Soleus muscles on affected side in children with hemiplegic CP.
Methods 16 children (8 boys, 8 girls with mean of age 6.25±2.89 years) diagnosed with hemiplegic CP were included in this study. All the subjects were treated using Bobath therapy plus tetanic faradic stimulation (TFS) on affected side (m. tibialis anterior). TFS was applied during 5 weeks (4 times a week, 20 minutes).
16 subjects were evaluated three times during the study (before treatment, the end of treatment and one month later) using universal goniometer and gait analysis. Range of motion of ankle-foot dorsi flexion on affected side was measured passively. Using goniometer, gait analysis was done to evaluate walking

characteristics such as support surface, step length, step width, heel strike and cadence.
The data obtained from this study was calculated using SPSS for WINDOWS'98 version
Results After treatment, the result of the goniometric measurements of ankle-foot dorsi flexion on the affected side showed high significant improvement statistically ($p<0.001$). However, this improvement didn't continue till first month after treatment ($p>0.05$). When the gait analysis revised, according to the considerations before, the end of treatment and one month later, a significant difference was found about support surface, only ($p>0.05$).
Conclusions As a result of this study, TFS showed just positive effects on range of motion of ankle-foot dorsi flexion in children with hemiplegic CP.

P 1166

Clinical electroencephalographic correlations of stammer in children

A. Mindadze, G. Natriashvili, S. Natriashvili
Tbilisi State Medical University, Tbilisi, GEORGIA

43 children with different forms of stammering have been examined. Age of the patients 3–10 years, 29 – male, 14 – female. Duration of stammering evolution varied from 1 month up to 6 years, and number of relapse amounted to 1–11. In 18 cases, obvious relation of stammer with exogenous factors has been revealed (group I– neurological form of stammering). In the remaining 20 cases, stammer has been insinuating, revealed without exogenous factors (group II– organic form of stammering). 5 patients of the group II have displayed convulsions in anamnesis and 3 other patients suffered epileptic seizures after revealing of stammer.
EEG research was carried out to all patients by 16-channel Medicor and 20 of them where additionally examined by computer EEG of brain mapping by means of Brain Survivor Saico apparatus. EEG patterns of group I patients predominantly varied within the limits of corresponding age norms. Patients of group II revealed paroxysmal activity of different qualities. It is noteworthy that the area of heightened excitability was mostly revealed at frontal-temporal abductions of the left hemisphere.
Drug therapy was carried out either by traditional preparations, tranquillizers, anti-depressant and sodium valproat (Depakin). In patients of group II positive therapeutic results of Depakin was revealed.

P 1167

The diagnostic dilemma in a child with visual loss and clinical symptomatology of demyelinating disease remains unsolved after a 4-year follow-up study

E. Tzamourani-Vontzalidou[1], A. Rossidou[1], A. Kiamili[1], N. Paterakis[2], Z. Parzaconi[3], G. Stavrakas[2]
[1]General Hospital of Elefsina, Neurology Dept., Athens, GREECE, [2]General Hospital of Elefsina, Opthalmology Dept., Athens, GREECE, [3]General Hospital of Elefsina "Thriassio", Athens, GREECE

In 1999 we presented the case, a girl 6.5 years old, who after a viral infection presented unilateral visual failure and spastic paraparesis, by arising the question whether Devic's disease is a unique syndrome of unilateral visual failure or a manifestation of multiple sclerosis.
The girl, 16.5 years old now, had been in therapy with presolone in combination with gamma globulin IV for 2.5 years. At the beginning of the therapeutical course, she presented two attacks, loss of vision 2/10 in the right eye. The last 2 years of the therapy the recovery led to vision 7/10. Two years without therapy – the recovery of vision is stable. Magnetic resonance imaging brain and optic nerves – normal.
If it were Devic's disease, could it be possible to expect recovery of the vision under treatment with presolone-gamma globulin, or the episodes of the loss of vision were a manifestation of multiple sclerosis?

P 1168

Parry-Romberg disease, case report

P. Szymanski, K. Tomczykiewicz, R. Janda, K. Macek, J. Kotowicz
Military Medical Academy, Warsaw, POLAND

The Parry-Romberg disease (progressive facial hemi atrophy-PFH) is a rare neurological disease. The aetiology and pathophysiology is unknown. Symptoms and physical findings associated with Parry-Romberg disease usually become apparent during the first decade of life or early in the second. In rare cases, the disorder is apparent at birth. This entity is characterised by atrophy of the skin, the subcutaneous tissue, sometimes the underlying bony structures, as well as the eye, the muscles, the larynx or pharynx. The authors present an unusual case of 42-year-old man with right side hemi atrophy (face, trunk, hand and leg) that began at the age of 6 and has progressed slowly until now. Family history was negative. Apart from the atrophy of the subcutaneous tissue and muscles of the right side of the body, general and neurological examination revealed no abnormalities. EMG examination showed delayed conduction time in the right personal nerve and the features of regeneration in the right tibialis anterior muscle. MRI, angio-MRI, CT scans, TCD EEG, as well as laboratory tests significant for collagenosis and scleroderma were normal.
Conclusions Sympathetic skin response test and termovision camera imaging, did not confirm damage within the autonomic nervous system, which has so far been reported.

P 1169

Cerebral blood flow velocity acceleration in a sleep apnoea syndrome with intracranial arterial stenosis

S. Behrens[1], K. Spengos[2,1], M. Daffertshofer[1], M. G. Hennerici[1]
[1]Dept of Neurology, University of Heidelberg, Klinikum Mannheim, Mannheim, GERMANY, [2]Dept of Neurology, University of Athens, Medical School, Athens, GREECE

Sleep apnoea syndromes (SA) of different etiologies (central, obstructive or both) are known to induce complications, such as tiredness, daytime sleeping, chronic headache and cardiovascular diseases including stroke. However, the exact mechanisms involved in cerebral ischemia are obscure. We measured the cerebral blood flow velocities (CBFV) by means of transcranial Doppler sonography in an 81-year old patient who presented with an acute ischemic stroke caused by an intracranial middle cerebral artery (MCA) stenosis in the presence of SA-syndrome. During apnoeas simultaneous recordings revealed reduced intraarterial oxygen, but increased carbon-dioxide-saturation, which resulted in an increased CBFV (220–303 cm/s) and suggested intermittent hemodynamic significance of a structurally only moderate MCA stenosis. Intracranial artery stenosis can become hemodynamically significant due to episodic hypercapnia in patients with SA. This may cause ischemic infarction in peripheral vascular territories.

P 1170

Sleep disorders in patients with hypothalamic syndrome of complicated genesis

M. G. Zhestikova
Institute of Postgraduate Training, Novokuznetsk, RUSSIAN FEDERATION

Aim The aim of our research was to study insomnic disorders in patients with hypothalamic syndrome of complicated genesis.
Material 359 of 450 patients studied there were women and 91 were men, ranging in age from 18 to 55 yrs. Hypothalamo-hypophyseal disorders of multifactorial aetiology have been detected in all our patients. Insomnia lasted for 1 wk to 10 yrs, the rate of night sleep disorders was found to be from 1 to 7 times per week.
Methods The following study methods were employed: clinical neurological, neurophysiology, magnetic resonance imaging (MRI), standard questionnaire tests approved by WHO, statistical analysis.
Results The reported complaint of sleep deprivation was rather common, with the prevalence rate of 66.85% in females and 57.14% in males. Frequent night arousals have been detected in 27.85% women and in 38.46% men. It should be noted that patients of the latter group were over 50 yrs of age and total sleep time was 4 hrs and 50 min. Sleep was characterized as "light sleep/direct speech". Many patients, 87% females and 86% males, complained of having dreadful dreams. Morning awakens was reported as "difficult/non-refreshing arousal" by 97% females and 89% males. Prevalence rate of presomnial disorders was 64.88%, of intrasomnial disorders it was 30%, and of postsomnial disorders it was 5.12%. In the elderly group, patients suffered from hypothalamic syndrome in the structure of "sleep-awakeness" circle.
Conclusion Sleep disorder in patients with limbic system dysfunction is found to be of great concern and needs proper diagnosis and treatment.

P 1171

Are the sleep patterns of fatal familial insomnia (FFI) related to different prion protein gene (PRNP) polymorphisms?

A. Garay[1], A. Reder[2], E. Van Cauter[2], S. Blanco[3], O. Rosso[3], J. Spire[2]
[1]CEMIC, Buenos Aires, ARGENTINA, [2]University of Chicago School of Medicine, Chicago, IL, USA, [3]Instituto de Cálculo, FCEyN-UBA, Buenos Aires, ARGENTINA

Objective To re-evaluate sleep patterns reported in a patient with FFI (D178N-129M plus 24bp deletion; (Neurology 1995; 45:1068) based on new molecular genetic evidence.
Methods We analysed extensively polysomnograms (PSGs) totalling over 100 hours performed between 4 to 1 months prior to death.
Results Total Sleep Time (TST) was reduced to 8.3± 3.8% of Total Recording Time (TRT); atypical REM sleep (aREMs) onset (6/6 PSGs) and aREMs preceding atypical NREM sleep (aSWS) devoid of spindling activity (3/6 PSGs) were observed during these studies. Sleep had preserved circadian (Nocturnal PSGs: 71.1±19.2 min.; Diurnal PSGs: 24.0±12.0 min., $p<0.05$) and ultradian periodicity (aREMcycle1: 98.1±30.4 min; aREMcycle2: 96.1±31.6 min.), and aREM presented a cyclic alternating pattern (CAP). Nocturnal dose of gamma-hydroxybutirate (GHB) produced a significant increase of aSWS.
Conclusions Recent data concerning polymorphisms of the PRNP give new insights about the phenotypical expression of pathogenic PRNP: 1) the influence of met/met polymorphism at codon 129 on the decrease of spindling activity (Neurology 2001; 56(3):A9), with the consequent inability to initiate sleep could allow the reversal of NREM-REM sleep presentation; 2) the octapeptide repeat deletions could play a causative role in the modulation of prion replication and disease presentation (Neuron 2000; 27(2):399; Neurology 2001; 57:354). It will be important to see whether other patients carrying these mutations exhibit similar altered sleep patterns.

P 1172

Mirtazapine induces confusion with hallucinations and REM sleep behaviour disorder in parkinsonism

A. Thomas, A. Luciano, D. Iacono, G. D'Andreamatteo, M. Onofrj
Neurophysiopathology, Pescara, ITALY

Mirtazapine is a new noradrenergic and specific serotonergic antidepressant drug. Shortly after the initiation of mirtazapine treatment of depression we observed the appearance of hallucinations, psychomotor agitation and cognitive changes accompanied by REM sleep behaviour disturbance (RBD) with apparent dream enactment in two male patients (1,2) affected by L-Dopa responsive parkinsonism and the appearance of RBD in a third male patient, with rigidity and cogwheeling in the left arm. These disturbances promptly remitted after the drug discontinuation and did not reappear in the following year (patients 2 and 3) and in following 2 years (patient 1). Polysomnography evidenced short onset REM sleep (SOREM) and lack of muscle inhibition with REM sleep during mirtazapine treatment. The observation might suggest that RBD can be triggered also by a drug lacking anticholinergic activity.

P 1173

Delayed diagnosis of the Kleine-Levin syndrome and treatment with Modafinil. Report of two cases

S. Boufidis[1], A. Karlovassitou[1], A. Balla[1], T. Karapanayiotidis[1], E. Vlahoyanni[2], P. Hamlatzis[1], S. Baloyannis[1]
[1]Aristotle University of Thessaloniki, Thessaloniki, GREECE, [2]"Agios Pavlos" General Hospital, Thessaloniki, GREECE

Introduction The Kleine-Levin Syndrome (KLS) is a rare disorder characterized by periodic hypersomnia, compulsive hyperphagia, behavioural-emotional disturbances and sexual disinhibiton lasting from a few days to a few weeks with almost complete remission during the intercritical periods. Very often the syndrome is under-diagnosed.
Method – Results Two cases are reported: a case of a 15 year old boy, in whom the diagnosis was delayed for 2 years, and one of a 34 year old man, who was diagnosed as KLS with a delay of 12 years. Upon their admission, we conducted a clinical assessment, a sleep study, a psychiatric assessment, as well as a brief neuropsychological evaluation which supported the diagnosis. The choice of treatment with modafinil was based on supposition of a hypothalamic dysfunction. Both of our patients responded to the treatment with modafinil and remission of symptoms has continued (for a period for more than 2 years).
Conclusion KLS often is diagnosed with delay and modafinil seems to be a promising help for the remission of symptoms.

P 1174

Polysomnographic findings in 40 patients with Parkinson's disease

N. J. Diederich[1], C. L. Comella[2], A. Bumb[1], J. Tiete[1], P. Lyen[1], M. Friedgen[1]
[1]Centre Hospitalier de Luxembourg, Luxembourg, LUXEMBOURG, [2]Rush Presbyterian St Luke's Medical Center, Chicago, IL, USA

Objective To describe the sleep abnormalities using polysomnography (PSG) in randomly selected patients with idiopathic Parkinson's disease (PD).
Background A variety of sleep abnormalities have been described in PD, ranging from primary involvement of sleep regulating centres to nocturnal recurrence of PD symptoms and side effects of pharmacotherapy. PSG studies have been rarely reported.
Patient sample and methods 40 PD patients (30 men, 10 women; mean age 65 [44–80] years; mean Hoehn-Yahr stage 2.5 [1–4]) underwent a PSG study with a 16-channel montage. All patients were taking their usual medications.
Results The mean sleep latency was 42+/–56 min. The mean percentage of deep sleep was 18+/–13 (17 patients with more than 20%). The average number of macroarousals was 29. The mean REM sleep percentage was 9.6 with a REM sleep latency of 171 min. No patient demonstrated a REM episode at sleep onset. There were polysomnographic or videographic signs of REM sleep behaviour disorder (RBD) in fifteen patients (38%). Nine patients (23%) had a periodic leg movement (PLM) index/ hour greater than 10. Twelve patients (30%), with a mean body mass index of 26, had a sleep apnoea syndrome (SAS) with a respiratory depression index/hour greater than or equal to 10; their mean lowest nocturnal oxygen saturation was 84 [58–90]%.
Conclusion In this series of PD patients, we found high percentages of RBD, SAS and PLM. Further studies assessing the risk factors and the prevalence of these abnormalities are indicated.

P 1175

Polysomnographic evaluation of daytime sleepiness and sleep attacks in Parkinson's disease

R. Manni, C. Pacchetti, M. Terzaghi, I. Sartori, R. Zangaglia, F. Mancini, V. Rustioni, D. Marchese
IRCCS Institute of Neurology "C.Mondino", Pavia, ITALY

Objective to evaluate daytime sleepiness, namely the features of sleep attacks in Parkinson's disease (PD) patients.
Study design A structured clinical interview, the Epworth Sleepiness Scale (ESS) and continuous 24-hour ambulatory polysomnography (A-PSG) were used to assess daytime sleepiness in a cohort of thirty-one PD patients.
Results Absence of abnormal daytime sleepiness was reported in six patients (group A). Rare microsleep and early afternoon voluntary naps were documented on A-PSG monitoring.
Mild to moderate sleepiness not resulting or rarely resulting in sleep only during moments of extreme relaxation was reported in twelve patients (group B).
Moderate to severe subcontinuous daytime sleepiness and an episodic urge to sleep sometimes actually resulting in sleep was reported in thirteen patients (group C).
The features of so-called sleep attacks, i.e., a sudden occurrence against a background of wakefulness, without heralding symptoms, were reported in eight of these patients with instances of falling asleep during the day. Polygraphic patterns of sudden NREM sleep onset were recorded in two patients of group C.
Group C showed a mean global ESS score significantly higher than group B and an higher occurrence of PSG-A documented microsleep and intentional naps.
Conclusions Sleep attacks can be clearly documented by A-PSG monitoring, represent a real, even if rare, occurrence in PD, and seem to represent the extreme of the continuum of daytime sleepiness observed in PD patients.
Patients with long-lasting disease and higher L-Dopa and/or dopamine agonist usage should be carefully evaluated in relation to the risk of developing sleep attacks.

Neuroepidemiology Neurogenetics

P 1176

"Direct" molecular diagnosis of spinal muscular atrophy in Moldova

V. C. Sacara, S. A. Groppa
Scientific Research Institute of Mother and Child Health Service, Chisinau, REPUBLIC OF MOLDOVA

Objective SMA is one of the most common and severe autosomal-recessive diseases of children. The pathology involves dysfunction and loss of anterior horn cells, leading to muscle atrophy and weakness. Three forms of SMA are recognized. All forms are caused by mutations in a single gene. In 95–98% a homozygous deletion of exon 7 and (or) 8 exon of the telomeric copy of the survival motor neurone gene (SMN1), which maps to chromosome 5q13, can be demonstrated by PCR.
Materials and methods 20 families with risk of SMA passed clinic-neurological, electromyography investigations and molecular study. DNA preparations were made from peripheral blood samples by routine methods, from chorionic villus samples and used for PCR. The EcoRV digestion necessary to distinguish the PCR product of exons 7(150bp) of SMN (8ex/BseNI (183bp) and its copy gene.
Results Molecular studies at the SMNI locus were performed in 65 individuals. The results of direct DNA diagnosis of SMA in admitted to the clinic for suspected SMA are: in 18 out of 20 families (90%) The diagnosis of SMA was confirmed at the molecular level by revealing homozygous deletion of exons7 and (or) 8 of the STNT at the probands. In 4 cases, we performed prenatal diagnosis (PD) SMA. In 2 out of 4 foetuses, we detected heterozygous deletion of the exons.
Conclusions Deletion detection and carrier testing is a decisive step in elaborating a reliable strategy of prenatal diagnosis in families at a high risk of SMA.

P 1177

Genetic and clinical analysis of spinocerebellar ataxia type 8 (SCA8) repeat expansion in Serbia

I. Topisirovic, N. Dragasevic, D. Savic, A. Ristic, M. Keckarevic, I. Petrovic, D. Keckarevic, B. Culjkovic, S. Romac, V. S. Kostic
Institute of Neurology CCS, Belgrade, YUGOSLAVIA

Introduction Spinocerebellar ataxia type 8 (SCA8) is the first form of slowly progressive ataxia causally associated with untranslated CTG repeat expansion on chromosome 13q21.

However, the role of the CTG repeat in SCA8 pathology is not yet well understood.
Patients and methods We investigated the occurrence of the SCA8 triplet expansion (CTA/CTG repeats; CRs) in a sample of 115 patients with ataxia [including 63 patients with dominant pattern of inheritance (ADCA), 28 patients with apparently recessive cerebellar ataxia (ARCA), and 24 apparently sporadic patients], 125 healthy controls, 64 unrelated individuals with non-triplet neuromuscular diseases, and 70 unrelated patients with schizophrenia.
Results All the studied individuals were negative for CTG expansions, except one male patient (18/100 CRs), aged 43, from the group of apparently sporadic patients. Beside ataxia with brisk tendon reflexes, he had infrequent incontinence, not explained by other causes, and abnormal visual and auditory evoked potentials. Asymptomatic father (28/140 CRs) and son (24/92 CRs) were explained by the low penetrance of the disease. In healthy Serbian population (378 total chromosomes) these alleles were in the range between 14 and 34 CRs.
Comment Our findings support the notion that allelic variants of the expansion mutation at the SCA8 locus can predispose ataxia.

P 1178

Clinic-genealogical features of hereditary neuropathies with pressure palsies, in Novokuznetsk population

O. V. Rudenkova, I. R. Schmidt, M. A. Peganova
Institute of Postgraduate Training, Novokuznetsk, RUSSIAN FEDERATION

Aim Our study was to make a clinico-genealogical analysis of families with hereditary neuropathies (HNs) with liability to pressure palsies.
Methods Neurological, clinico-genealogical; gene segregation analysis, and electromyographic studies.
Materials Fifty kinships with the obtained data of 232 relatives have been studied. There were 187 first-line relatives: 81 parents, 75 siblings, 31 children and 45 second-line relatives. Segregation analysis was conducted in 56 nucleus families: parents and their children.
Results Characteristic features of HNs with liability to pressure palsies were identified in 65.8+3.5% relatives of the first-line. The difference was found to be statistically significant ($P<0.01$) when $t=5.1$ and $x2=128.7$, $P\ x2<0.0001$ compared to the population rate sample. Correlation coefficient was $r=+0.33$. Segregation analysis carried out according to Vainberg's proband method has demonstrated that HNs with liability to pressure palsies in our studied patients were inherited through autosomal-dominant type with incomplete penetrance and variable gene expression found out in the families and probands. Autosomal dominant mode of transmission has been confirmed by delectable changes of impulse conduction velocity through peripheral nerves and by increased residual latency identified in clinically healthy relatives of first-line. This fact provides evidence that some family members are most likely to be at high risk for developing pressure palsies. Marked changes of residual latency may help to identify the most vulnerable nerve for inadequate compression.
Conclusion HNs with liability to pressure palsies in our population are characterized by a typical clinical polymorphism and autosomal-dominant mode of transmission with incomplete penetrance.

P 1179

Parkin proven disease: common founders but divergent phenotypes

J. A. Wiley[1], S. Lincoln[2], T. Lynch[1], W. J. Langston[3], R. Chen[3], A. Lang[4], E. Rogaeva[4], J. Harris[5], K. Marder[6], C. Klein[7], G. Bisceglio[2], J. Hussey[2], W. Andrew[2], J. Hardy[8], M. Farrer[2]
[1]Mater Misericordiae Hospital, Dublin, IRELAND, [2]Mayo Clinic, Jacksonville, FL, USA, [3]The Parkinson's Institute, Sunnyvale, CA, USA, [4]University of Toronto, Toronto, ON, CANADA, [5]Columbia University, New York, NY, USA, [6]Taub Institute, New York, NY, USA, [7]Medical University of Luebeck, Luebeck, GERMANY, [8]NIH, Bethesda, MD, USA

Objective To describe six probands with Parkinson's from six families each having inherited a common parkin exon 3, 438 to 477bp deletion (exon 3 40bp del).
Background Farrer and colleagues previously reported 2 families in which a parkin exon 3 40bp deletion segregated with disease. We now report the clinical phenotype in four additional probands with homozygous or compound heterozygous parkin exon 3 40bp deletion.
Methods Semi-quantitative multiplex PCR was performed for exon deletion/duplication. In addition, all exons and intron-exon boundaries were sequenced. Haplotype analysis was performed by genotyping fluorescently labelled markers about the parkin gene.
Results Four of six were compound heterozygotes, one was novel with an exon 3 40bp deletion and an exon 3 duplication, whereas three probands had an exon 3 40bp deletion and an exon 7 924 bp C>T (R275W) mutation. Of the remaining probands, one was homozygous for the exon 3 40bp deletion and one had early-onset parkinsonism and only a single exon 3 40bp deletion and a normal parkin allele. Haplotype analysis suggests that the exon 3 40 bp deletion originates from a common Irish founder.
Conclusion Parkin proven disease can have common founders but divergent phenotypes. Disease has a variable clinical presentation and mode of inheritance although haplotype analysis revealed the common exon 3 40bp deletion originated from an Irish founder. These patients now provide a powerful resource to examine the effect of environment/genetic background on the clinical pathology of genetically defined Parkinsonism.

P 1180

Subtle mutations in Polish SMA patients

M. Jêdrzejowska[1], W. Wiszniewski[2], I. Hausmanowa-Petrusewicz[1]
[1]Polish Academy of Science, Neuromuscular Unit, Warsaw, POLAND, [2]National Research Centre of Mother and Child, Department of Medical Genetics, Warsaw, POLAND

Autosomal recessive proximal spinal muscular atrophy (SMA) is the neuromuscular disorder caused by the mutation (deletion, conversion or subtle mutation) of the telomeric copy of the survival motor neuron gene (SMN1). The loss of the nearly identical centromeric copy does not cause SMA. About 95% of SMA patients show homozygous absence (deletion or gene conversion) of at least exon 7 telomeric copy of SMN gene, the rest present a compound heterozygosity with a subtle mutation on one allele and a deletion or gene conversion on the other.
In our study, we searched for small intragenic mutation among twelve non-deleted SMA patients. There are 25 different subtle intragenic mutations in 58 patients described up to date, which include missense, nonsense, frame shift mutations, inversions,

deletions and splice site mutations. All examined patients presented relatively mild phenotype (3a and 3b), apart from one sibling with Werdnig-Hoffmann syndrome. Using direct sequencing, we identified one missense mutation (T274I) in SMN1, connected with mild phenotype (3a). The rest of analysed group could carry mutations in SMN promotor region or is unlinked to 5q13.

P 1181

Apolipoprotein E genetic polymorphism and stroke subtypes

M. Baranska-Gieruszczak[1], G. Gromadzka[2], A. Ciesielska[1], I. Sarzynska-Dlugosz[1], T. Mendel[1], A. Czlonkowska[2]
[1]Institute of Psychiatry and Neurology, 2nd Dept. of Neurology, Warsaw, POLAND, [2]1-Institute of Psychiatry and Neurology, 2nd Dept. of Neurology; 2-Medical University of Warsaw, Dept. of Experimental and Clinical Pharmacology, Warsaw, POLAND

The association between apolipoprotein E (apoE) genetic polymorphism and stroke has not been completely understood.
We investigated the association between ApoE genotypes and stroke subtypes in 244 patients included into the study. The diagnosis in all cases has been established on the basis of history and full neurological examination, standardized blood tests, CT scan of the brain, Doppler sonography of the carotid arteries and a cardiac analysis that included echocardiography.
Cerebral infarction was classified anatomically into cortical and penetrating region and etiologically into thrombosis and embolism. Cerebral haemorrhage was considered as a whole in all analyses.
PCR RFLP method has been used to determine ApoE genotypes.
Results The most frequent genotype was E3/3 (66.4%) followed by E3/4 (17.2%), E2/3 (14.8%) and E2/4 (1.6%). We observed differences in the frequencies of ApoE genotypes between groups of patients with different stroke subtypes, infarction volume, number and pathology of lesions.
In the univariate logistic regression analysis, E4 allele carriage conferred an increased risk for cardio embolic stroke (OR=3.04, 95% CI 0.8–11.3, p=0.07), carotid artery occlusion (OR=1.13, 95% CI 0.39–3.2, p=0.05) and hemorrhagic stroke (OR=2.57, 95% CI 0.98–6.73, p=0.05). Epsilon 4 carriages presented a tendency to be associated with increased risk of death during 30-days period following stroke (OR=1.99, 95% CI 0.9–4.4, p=0.08).
Conclusion Results of our study suggest that genetic variation at the ApoE locus in Polish stroke patients population is a genetic factor that influence the risk of embolic stroke, hemorrhagic stroke, carotid artery occlusion and can establish a risk factor of death during 30-days period.

P 1182

Paraoxonases genes polymorphisms in ischemic stroke of different aetiology

P. Szermer, A. Slowik, J. Pera, L. Glodzik-Sobanska, A. Szcudlik
Jagiellonian University, Krakow, POLAND

Background Paraoxonases genes polymorphisms play an important role in determining the anti-atherogenic action of paraoxonases. This function in humans has been demonstrated in the coronary artery disease. The impact of paraoxonases genes variability on risk of ischemic stroke is still not certain.
The aim of this study was to assess the M/L54 of PON1 and C/S311 of PON2 polymorphisms in patients with ischemic stroke of different aetiology, based on TOAST criteria (Adams, Stroke 1993).
Material and methods The study population included 48 patients with small vessel disease, 49 patients with large vessel disease, 59 patients with cardioembolic stroke and 122 healthy control subjects. The genotyping was carried out with the restriction enzyme digestion pattern after PCR amplification.
Results Genotype distribution and allele frequencies of M/L54 and C/S311 were similar among the patients and control group. There were also no significant differences among stroke subgroups.
Our study indicates that probably neither M/L54 nor C/S311 polymorphisms are involved in pathogenesis of ischemic strokes due to large vessel disease, small vessel disease or cardioembolism.

P 1183

Hypokalemic periodic paralysis, age of onset in Iranian patients

M. Harirchian
Tehran University, Tehran, ISLAMIC REPUBLIC OF IRAN

Objective To investigate the age of first attack of primary hypokalemic periodic paralysis in our patients and know whether there is any difference between them and other studies about the age of onset of this disease.
Background Primary hypokalemic periodic paralysis is a familial channelopathy inherited as an autosomal dominant trait. The first attack of paralysis may be evolved at any age, but several studies indicate that its onset (first attack) is most common in second decade, so that some authorities believe that an episodic weakness beginning after age 25 is almost never due to primary periodic paralysis.
Design and methods In a retrospective study, we reviewed the patients admitted in two hospitals of Tehran University of Medical Science during 1992–2001. We reviewed the medical data's of 50 patients with flaccid weakness and hypokalemia and 27 patients were excluded due to deficits in documents and inclusion and exclusion criteria. Twenty-three patients remained with the diagnosis of primary hypokalemic paralysis.
Results First attack was beyond age 20 in 13 patients (56.5%) and beyond 25 in 9 patients (39%). Two patients were below age 15, 8 in 15–20, 4 in 20–25, 3 in 25–35, 4 in 35–45, and 2 were more then 45.
Conclusion Age of first attack is much more than other studies and it seems to be a difference between our epidemiological characteristics with west.

P 1184

The spread and clinical development of myasthenia gravis in the Republic of Belarus

T. Korbut, E. Ponomareva
Research Institute of Neurology, Neurosurgery and Physiotherapy, Minsk, BELARUS

Introduction Myasthenia gravis (MG) was considered to be a very rare disease. But for the last few years, it has increased in the world and now it is one of the most widespread nervous and muscular pathology.
Methods In the Republic of Belarus 769 people who suffer from MG (67% of women and 33% of men aged from 2.5 to 92 years) have been under observation for more than 20 years. The disease was diagnosed on the basis of a medical examination,

diagnosis myasthenic tests, and electroneuromyography. The results have been analysed.

Results The first cases of MG were reported in 1980 and accounted for 0.031 per 100000 people, in 1983 there were 0.230 cases, in 1990 – 0.343, in 1996 – 0.561 and in 2001 – 0.630. The age group has also changed. The number of people over 60 has increased while the number of children and teenagers has decreased. There prevails a generalized form of the disease (59%). In 56% of cases, treatment with anticholinesterase medicines doesn't give full compensation. 271 patients underwent thymectomy, 39.6% of them had a benign tumour of the thymus and 2.6% – a malignant tumour.

Conclusion In the Republic of Belarus there has been reported a significant growth of MG, increasing of tumour of the thymus. It might be connected with the ecological situation in the country and the Chernobyl disaster consequences in particular.

P 1185

Risk of cancer in patients with Parkinson's disease

P. Ragonese[1], M. D'Amelio[1], G. Salemi[1], M. Ruggirello[1], A. Epifanio[2], L. Morgante[2], G. Savettieri[1]
[1]University of Palermo, Palermo, ITALY, [2]University of Messina, Messina, ITALY

Introduction Several surveys reported lower cancer risk in Parkinson's disease (PD) patients compared to the general population. Most of these studies were however based on death certificates, which are not representative of the general occurrence of cancer. We estimated the risk of cancer in people with PD trough means of a case-control study.

Methods Cases: PD patients from two Neurological Departments. Controls: PD free individuals, matched by age (+/– 2 years) and sex, randomly selected from all residents of the municipalities of residence of cases. Occurrence of cancer was assessed through a structured questionnaire. Cancer was categorized as follows: benign, malignant or of uncertain classification tumours and, endocrine related or not. Odds Ratios (OR) were calculated using conditional logistic regression and adjusted for gender, cancer categories, and known cancer risk factors.

Results We included 211 PD patients (123 women, 88 men). Mean age at PD onset was 59.5 years. Frequency of cancer was 11.4% for PD patients, 24.7% for controls. Patients with Parkinson's disease had a significantly decreased risk for cancer (OR 0.3; CI 0.2, 0.6). Risk was reduced for women (OR 0.3; CI 0.1, 0.6) and for men (OR 0.5, CI 0.2, 1.2). PD patients had a decreased risk for malignant compared to non-malignant neoplasm (OR 0.6, 95% CI 0.2, 1.7). Still, risk was increased for endocrine related tumours compared to non-endocrine related malignancies (OR 1.8, 95% CI 0.6, 5.3).

Conclusions Our study confirms the lower risk of cancer among PD patients reported in previous epidemiological studies.

P 1186

Epidemiological studies on patients with persistent vegetative state/apallic syndrome in Vienna – a study of the prevalence

C. Stepan
Otto Wagner Hospital, Vienna, AUSTRIA

Searching for data concerning the prevalence of persistent vegetative state/ apallic syndrome (PVS/AS), international literature does not contain exact information. That depends on several reasons as variable diagnostic criteria in different countries or that health agencies do not include PVS/AS as a codable diagnosis.

Due to the insufficient information on prevalence of PVS/AS, a survey on this topic was conducted in Vienna in November 2001. The aim was to register all patients with the diagnosis PVS/AS in a defined area during an exact period of time. The defined area was the city of Vienna with an exact recorded number of inhabitants (1.6 Mio.). November 28th was determined as the day of the examination.

To exclude all source of error, all reported patients, under consideration of epidemiological rules, were examined by a neurologist. Leading the evaluation of all patients by one person, problems based on different examiners were excluded.

32 patients with the diagnosis PVS/AS could be observed. 13 of the patients were treated in a hospital and 19 in a nursing home. 7 patients had a traumatic and 25 patients a non-traumatic aetiology for developing a PVS/AS.

The prevalence of PVS/AS in the area of Vienna was 2.1/100 000 citizens. A longitudinal examination was started to observe the result in its course.

P 1187

Diabetic neuropathy in Satu Mare district (Romania) – epidemiological data

Z. A. Bzduch[1], M. G. Bzduch[2], I. Szilagyi[2], A. M. Mos[3]
[1]Caritas Medical Center Satu Mare, Satu Mare, ROMANIA, [2]Satu Mare, ROMANIA, [3]Oradea, ROMANIA

The importance of diabetic neuropathy is widely recognised. Our study is to determinate the real epidemiological status in the district of Satu Mare, Romania.

Our material consists from a lot of 4351 diabetic patients evaluated for the presence of diabetic neuropathy and other manifestations such as form, gravity, clinical signs, and localization of neuropathy. Patients were selected by function of type of diabetes, age, sex, and age of inset. Another selection of the patients was made function of the affected nervous system, either peripheral or autonomic. Epidemiological data will be represented graphically. In our study, we obtained a main prevalence of 38.1% for neuropathy. In the group of type 1 diabetic patient, the main prevalence of the neuropathy was 15.4%, and in the group of type 2 diabetic patients, this value were of 43.9%, respectively. Other epidemiological data will be presented in our study.

In conclusion, our data shows a higher prevalence of diabetic neuropathy, comparing with the general data found in literature. Our data underlines the importance of new and effective measures for evaluation and treatment of diabetic and neuropathic patients.

P 1188

Is TGA a seasonal disorder? Evidence from a hospital based population

C. Agosti, N. Maalikj Akkawi, B. Borroni, A. Padovani
Clinica Neurologica Spedali Civili, Brescia, ITALY

Introduction Transient global amnesia (TGA) has been defined as the abrupt onset of transient inability to form new memories, repetitive queries and retrograde amnesia without neurological symptoms or sign. Many precipitants factors have been described. We observed that patients affected by TGA were admitted at our hospital especially in cold days, so we investigated whether there is a relationship between lower temperature and admittance of TGA patients.

Materials and methods 225 patients affected by TGA and 225 patients by transient ischemic attack (TIA) were admitted to the Department of Neurology, Spedali Civili, Brescia, Italy. The two groups were matched by sex and age. We evaluated: maximum temperature (Tmax), minimum temperature (Tmin), mean temperature (T=[T recorded at 8 am + T recorded at 7 pm + Tmin + Tmax]/4), excursion temperature (DT= Tmax-Tmin), mean atmospheric pressure reduced to the sea level (P), mean relative humidity (RH), mean water vapour pressure (e). The meteorological station of the "Pastori Technical Institute", Brescia, collected these parameters.
Results The mean values of Tmax, Tmin, DT and Tmean were significally lower in the days of admittance of TGA and the frequency of TGA decreased with the increasing of the temperature. There were no correlations with the other parameters considered. The difference in frequency of TGA and TIA respect to the mean temperatures classified in quartiles was highly significant ($p<0.02$).
Conclusion The frequency of TGA increases with the lowering temperature while barometric pressure, mean water vapour and humidity do not influence the incidence of TGA.

P 1189

Epidemiological study of multiple sclerosis among people suffering from Chernobyl disaster in Mogilev region (Belarus)

G. Naumova, M. Klimova, A. Naumov
Vitebsk Regional Centre for Medical Diagnostics, Vitebsk, BELARUS, Branch of Clinical Research Institute for Radiation Medicine and Endocrinology, Vitebsk, BELARUS

In the context of a national Project "Health status evaluation of population, suffering from the Chernobyl disaster", a descriptive epidemiology of multiple sclerosis on the Mogilev region (Belarus) was done.
The aim of our investigation was to carry out an epidemiological study on multiple sclerosis checking out the epidemiological hypothesis concerning the action of low dose radiation exposure.
We performed a population-based case ascertainment of all available sources of medical care including the State Belarussian Register of people subjected to radiation exposure after Chernobyl disaster.
The study was conducted since May 1986 to December 2000. The total number of inhabitants in the area (29,100 km^2) was 1,200,000.
The average annual incidence was between 1.5–9.5 per 100,000 (1.1–9.0/100,000 in men and 2.9–12.6/100,000 in women).
There was an apparent peak of the incidence in 1986, which was clearly the result of improved case detection due to obligatory universal clinic system for such people initiated since that time.
Clinical profiles of these patients in most respects were similar to those commonly observed in the multiple sclerosis population. The initial remitting-relapsing of multiple sclerosis was the prevalent type of clinical course of the disease.
The mean age of the patients at onset was 32.6 years.
54% of the patients suffering from multiple sclerosis were disabled persons.

P 1190

Neurological and psychiatric forms of adult metachromatic leukodystrophy: phenotype/genotype relationships.

J. Turpin[1], N. A. Baumann[2], M. Lefevre[2], B. Colsch[2]
[1]Salpetrière Hospital, Paris, FRANCE, [2]INSERM Unit 495 and Salpetrière Hospital, Paris, FRANCE

Metachromatic leukodystrophy is due to a deficiency in arylsulfatase which hydrolyses sulfogalactosylceramides and other sulfated glycolipids (sulfatides). In function of age, the clinical manifestations are different. The infantile form is characterized by a regression of acquired motor and later of mental activities. There are also adult forms, which do not occur, in the same families. Moreover, in the adult, there are two clinical variants, one in which motor signs are predominant, the other in which psychiatric symptoms dominate, although secondarily the patients become bedridden and demented. The evolution in the adult forms may be of several decades. In all those cases in the adult, the enzyme deficiency is identical as well as sulfatiduria, which relates to the absence of the catabolic enzyme for sulfated glycolipids. Interestingly, it is well known from the work of V. Gieselmann (reviewed in Human Mut. 4: 233–243, 1994). That the mutations in infantile forms are different from those occurring in the adult, which may explain homochrony. There seem to be specific mutations according to the motor and psycho cognitive types in the adult, i.e. P426L for motor forms in a homozygote form and in the psychiatric forms a specific I179S mutation as a compound heterozygote. Studies are in progress to determine the precise clinical characteristics of the psychiatric forms and whether the I179S mutation of arylsulfatase A could be a susceptibility factor of schizophrenia.

P 1191

A female carrier of Fabry disease with multi-infarct encephalopathy and extrapyramidal symptoms. A case report.

S. Büchner[1], S. Ramat[1], A. Pupi[2], W. Borsini[1]
[1]Department of Neurology, Hospital of Careggi/University of Florence, Florence, ITALY, [2]Department of Nuclear Medicine, Hospital of Careggi/University of Florence, Florence, ITALY

Introduction Fabry disease is a lysosomal storage disease, X-linked, secondary to deficiency of alpha-galactosidase A (α-GAL A), which results in progressive accumulation of globotriaosilceramide in endothelia. Cerebrovascular manifestations (strokes of early onset) frequently complicate Fabry, also in some female carriers. Extrapyramidal signs are unusual. We report a case of a 54 y. o. female Fabry patients with cerebrovascular alterations in brain MRI and extra pyramidal symptoms.
Case report A 46-year-old female developed bradykinesia and rigidity on the left hemi soma. Her past medical history included acroparesthesias in childhood, spontaneous miscarriages and thrombophlebitis. Cornea verticillata was detected. Brain MRI showed lacunar infarctions in the basal ganglia and in the periventricular white matter. Her α-GAL A-activity was reduced and she presented a point mutation in the α-GAL A-gene; the diagnosis of Fabry disease with cerebrovascular complications was done. She started treatment with L-Dopa. The extrapyramidal symptoms initially had a good response, but then they showed a rapid and progressive course. Since 51 years, she has been suffering for on-off symptoms.

Discussion It's difficult to say if the extrapyramidal symptoms are caused by the cerebrovascular complications of Fabry disease or by an idiopathic Parkinson. The clinical history and the response to L-Dopa suggest an idiopathic form; brain MRI positive for infarction in the basal ganglia a secondary form.
Conclusion A female carrier of Fabry disease presented cerebrovascular complications and extrapyramidal symptoms. The extrapyramidal symptoms are of uncertain pathogenesis and need further evaluations like brain PET/SPECT, with studying the metabolism and the neurotransmitter of the basal ganglia.

P 1192

Genotype study of Steinert's myotonic dystrophy in men and women in Bashkortostan (Russia)

L. Akhmadeyeva[1], R. Magzhanov[1], R. Fatkhlislamova[2], E. Khusnutdinova[2]
[1]Bashkirian State Medical University, Ufa, RUSSIAN FEDERATION, [2]Institute of Biochemistry & Genetics, Ufa, RUSSIAN FEDERATION

For the last decade since the mutation associated with Steinert's myotonic dystrophy (DM1) was discovered, scientists are analysing the length of expansion of CTG-repeats at 19q13.1 in patients of both genders. The results vary from study to study. Our **purpose** was to perform genotype study in populations of DM1 patients living in Bashkortostan Republic (Russia) and to compare the data from males and females.
We used standard **methods** for DNA extraction and analyses including PCR and Southern blot.
The mutation was detected in 52 DM1 patients (28 men and 24 women) aged from 5 up to 74 (mean 44.63, standard error of mean – 2.12, standard deviation – 15.17, median – 43.00). In 67% of patients, the size of expansion in different blood cells was different and here we are using the biggest numbers counting in base pairs (bp). The mean length of mutation in our patients was 2503±229 bp and it did not have significant difference in both genders (2388±332 bp in men and 2558±331 bp in women, p=0.71). Both men and women had approximately equal proportion of small (less than 1000 bp), medium (1000–3000 bp) and large (over 3000 bp) expansions (mean – 27%, 36% and 37% accordingly) with no statistical difference between the groups.
This study allows us to **conclude** that the size of DM1 mutation in male and female patients in Bashkortostan does not differ significantly. To continue our study we will analyse our population by pairs "affected parent – affected child".
Supported by Russian Foundation for Basic Research.

P 1193

Clinical epidemiology of aneurysmal subarachnoid haemorrhage at tertiary level hospitals in Latvia

I. Macane, M. Buks, V. Keris, Z. Kalnina, A. Vetra, N. Jurjane
Medical Academy of Latvia, Riga, LATVIA

Introduction Aneurysmal subarachnoid haemorrhage (ASAH) is a devastating event associated with significant morbidity and mortality. The aim of study was to obtain incidence rates, clinical course and case fatality of ASAH for health care services of tertiary level in Latvia.
Methods A retrospective population-based study included Latvian residents aged 20 to 79 yrs. Inclusion criteria was ASAH confirmed either by computed tomography or magnetic resonance imaging and cerebral angiography or autopsy. Hunt-Hess grade at admission and modified Rankin disability scale score, at discharge, have estimated clinical condition of each patient.
Results A total of 546 ASAH patients were registered from the beginning of 1996 till the end of 2000. The mean age (±SD) of study population was 51.0±0.8 y. regarding referral territory, 47% was from Riga (the capital of Latvia). The mean annual incidence rates were 6.4 per 100 000 population in Latvia and 10.0 per 100 000 – in Riga. There were not significant differences between age-specific incidence rates in men and women. The mean age-adjusted incidence rate was 5.8 per 100 000 per year. The annual hospital fatality fluctuated from 28% to 42%. The mortality rate was 32% for all hospitalised patients and 15% for operated patients.
Conclusions The ASAH incidence rates for Latvia were consistent with other north European region countries. The case fatality at level III hospitals was high without tendency to decrease. The view woman have a higher risk of subarachnoid haemorrhage does not correspond to ASAH in Latvian population.

P 1194

The analysis of the beginning of multiple sclerosis (MS) in the group of patients in Lublin (Poland)

A. J. Lobinska[1], T. Hasiec[2], Z. Stelmasiak[2]
[1]Neurological Polyclinic, Swidnik, POLAND, [2]Neurological Clinic, Lublin, POLAND

The aim of the study was to analyse the beginnings of MS with patients in Lublin, in 2001. The average age of developing the illness was 30.11 years; 30.34 years for women; 29.88 years for men. The earliest age of the disease development was 5 years (it was a girl); the latest was 52 years (it was a woman too). There was a period of 3.8 years, on the average, between the appearance of the first symptoms and the diagnosis. Most often, the beginning of the illness was monosymptomatic, 155 patients (75.98%). The polysymptomatic beginning was with 37 patients (18.14%). The most common first symptom was sensory impairment. For the relapsing-remitting (RR) and secondary progressive (SP) forms the illness usually started in the spring. The sufferers reported a cold and virus infection of the respiratory tract that most often precede the first symptoms of multiple sclerosis.

P 1195

Trends in mortality from cerebrovascular disorders in Moldova

R. Baltag
Scientific and Practical Centre of Neurology and Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA

Objective Cerebrovascular disorders are viewed as a concerning problem, both medically and socially. This is due to the big burden and high incidence of severe consequences owing to this group of diseases: high fatality coupled with a prolonged disability. The purpose of this paper is to evaluate the level of mortality from stroke in the Republic of Moldova.
Material and methods Deaths due to stroke have been defined as those classified with ICD-9 codes 430–436 and ICD-10 I60–I64.
Outcomes The mortality rate from stroke in Moldova accounted for 169.56 per 100,000 population in 1999, ranking cerebrovascular conditions I60–I69 second after the "ischemic heart disease I20–I25" with 422.5 cases of deaths per 100,000 inhabitants. There is an insignificant increase in the indicator

figures, and not a soothing one, as compared to 1998 (161.74 per 100,000 people).
Discussion Figures show stroke ranking second as the main cause of death countrywide. The mortality rates owing to strokes in the Republic of Moldova is 5 to 6 times higher than those in other European countries, but more alarming is that this indicator displays no trends in slowing down and reversing.
Conclusions Stroke ranks second as the main cause of death in adult population of Moldova.
There is a trend in stroke mortality rates up-going over the last several years in the mainstream population of Moldova.

P 1196

The role that circulatory disorders play in the general mortality rates of population of the Republic of Moldova

R. Baltag[1], C. Etco[2], N. Istrati[1]
[1]Scientific and Practical Centre of Neurology and Neurosurgery, Chisinau, REPUBLIC OF MOLDOVA, [2]Health Management Dept., Chisinau, REPUBLIC OF MOLDOVA

Introduction The main cause of death in adult population of the Republic of Moldova, much alike in developed European countries and USA, is due to circulatory system conditions, entailing almost 12m death cases in Europe alone yearly. The given paper aims at assessing levels of mortality owing to circulatory system disorders in the overall mortality.
Materials and methods Deaths have been defined as those classified under ICD 10.
Results 53% out of 1,093.1 deaths per 100,000 population occurred throughout 1998 were due to circulatory system disorders; whereas in 1999 this share was even higher nationwide – 55% from the overall number of death cases, in absolute figures coming as high as 1,133.7 per 100,000 people. Thus, the mortality due to circulatory system disorders (made up of three components: strokes, ischemic heart disease, and other cardiovascular disorders) accounted for 623.8 per 100,000 people in Moldova in 1999, that is 48.2 per 100,000 people more vs. 1998.
Discussions The study carried out proved that the burden of circulatory system disorders in the overall mortality of population is very high.
Conclusions Sharing of experience that developed countries gained in decreasing the level of mortality due to circulatory system disorders needs to be implemented to develop national preventive programs.

P 1197

The natural history of initial subarachnoid haemorrhage (SAH) in unselected patients

E. V. Barabanova[1], I. P. Antonov[1], E. K. Sidorovich[2], I. M. Pralyhina[1], O. M. Kondratjeva[3]
[1]Belarussian Research Institute of Neurology, Minsk, BELARUS, [2]Clinical Hospital N 5, Minsk, BELARUS, [3]Belarussian State University, Minsk, BELARUS

A common practice in our country is admission of patients with the initial SAH to a neurological department, where diagnose is made and neurological/neurosurgical observation is performed. A case-series study of SAH was carried out from 1997–2001 in the Neurological Department of our Clinic, which provides health maintenance for more than 400,000 inhabitants.
The database included 137 symptomatic and laboratory and/or computed tomography proved SAH patients (58 men, 79 women). The mean age for men was 52.2±1.4, for women - 57.8±1.4 years old. 54.8% of all patients were in the age interval of 30–60 years (75.3% men, 40.7% women). An age peak for men was from 40 to 50 years, for women – from 60 to 70 years. An average case fatality rate was 21.2% (25.9% in men, 17.7% in women). The age distribution of short-term mortality showed the peak in men of 50–60 and in women of 60–70 years old; 80% of fatal cases were observed in men of 40–60 years old instead of 28.6% in women of the same age. Saccular aneurysms as a cause of SAH were diagnosed by cerebral vessels angiography in 21.9% of patients (24.1% in men, 20.3% in women). A frequency of aneurysmal SAH was significantly higher in younger patients. In 56.2% of the cases, SAH was associated with arterial hypertension.
The results of this study and previous data on population study of SAH showed, that standard risk of initial SAH corresponds to 40–60 year old men and 60–70 year old women.

P 1198

Disability pension of patients with multiple sclerosis (MS) in Lublin (Poland)

A. J. Lobinska[1], Z. Stelmasiak[2], T. Hasiec[2]
[1]Neurological Polyclinic, Swidnik, POLAND, [2]Neurological Clinic, Lublin, POLAND

The aim of our study was to evaluate the problem of disability pension among MS sufferers. 204 patients living in Lublin in 2001 were examined. The average age in the group was 45.5 years. Out of the group of 204 patients, the pension was assigned to 172 people (84.14%), 119 (69.2%) women and 53 (30.8%) men.
The average disability degree according to the Kurtzke's scale – EDSS was 3.5; 3.4 for women, 3.6 for men.
The disease form, its course, EDSS of the patient, his education status, was of no influence to obtaining the pension.
From the first symptoms of the disease to the pension assignment, there was an average period of 5 years. The majority of the disability pensions were assigned in the 90-ties (47.6%), 28.6% in the 80-ties and 23.8% in the 70-ties. If the patient developed the illness in the 60-ties, he obtained the pension after the average 9.5 years. If he fell sick during the 70-ties, the pension was assigned to him after 8 years. If the illness started in the 80-ties he was due to get the pension after 5.4 years, and if it began in the 90-ties, after 3.25 years.

P 1199

The trends in incidence and survival of primary CNS tumours in the population of Primorje-Gorski Kotar region-Croatia (1977–2000)

L. Tuskan Mohar[1], M. Weiner Crnja[1], I. Antoncic[1], K. Willheim[1], A. Jurjevic[1], E. Materljan[2]
[1]KBC Rijeka, Rijeka, CROATIA, [2]Dom zdravlja, Labin, CROATIA

Introduction Descriptive epidemiology of primary CNS tumours has been the subject of several studies, indicating a possible increase in CNS tumour rates. The aim of this study was to evaluate incidence and survival of patients with primary CNS tumours diagnosed between 1977 and 2000 in our Region.
Methods Between 1977 and 2000, 911 registered patients with diagnosis of primary CNS tumours were reviewed. The incidence rates by gender, age, tumour location and histological type were calculated for whole and for two times period of investigation (1977–1986 and 1991–2000). Temporal trends were analysed. Survival rates at 1 and 5 years were also estimated.
Results Eighty-six percent of the tumours were pathohistologically confirmed and 14% were clinically verified. Total

annual incidence of all CNS primary tumours was 11.5/100 000/year, (10.7 for intracranial and 0.5 for intarsia location). Mean age at diagnosis year was 50.7 the most common tumour types were glioblastoma (26.1%). It was an increasing trend of incidence rate from 9.69/100 000/year (1977–1986) to 12.19/100 000/year (1991–2000). The most increase incidence was noted for meningiomas (from 1.0 to 3.17). The 1-year survival for all tumours was 60.5% (95% CI=57.2–65.8) and the 5 years survival was 52.2% (95% CI=48.7–55.7). Comparing the first and the second time period, significant improvements occurred in survival for all tumours.

Conclusion The results of this study confirm the observation made in other countries that the incidence of primary brain tumours is increasing, and the further research into their aetiology and treatment is required.

P 1200

Hereditary thrombophilia in cerebral venous thrombosis in Pécs (Hungary)

Á. Klabuzai[1], J. Czopf[1], I. Gáti[1], Á. Nagy[2], B. Melegh[3], L. Szapáry[1]

[1]Department of Neurology of Pécs University, Pécs, HUNGARY, [2]Department of Haematology, Pécs, HUNGARY, [3]Department of Human Genetics, Pécs, HUNGARY

Introduction In the last few years several studies suggested that the most frequent hereditary risk factors for cerebral venous thrombosis (CVT) are the mutations of factor V Leiden (FVL)(11–24%) and prothrombin (PTR)(6–20%) genes. The aim of this study is to compare Hungarian data with the data of those studies.

Methods 41 CVT patients have been treated at the Department of Neurology of Pécs University (Hungary) (1995–2001). 37 patients were screened for hereditary thrombophilia (antithrombin III (ATIII), protein C (PRC), S, (PRS) deficiency, FVL, and PTR gene mutation).

Results 10 hereditary thrombophilia have been verified in 8 patients (5 FVL heterozygous (HZ), 1 homozygous (HO), 1 PTR gene mutation and 1 ATIII, 2 PRS deficiency have been found). In 2 patients, combined hereditary thrombophilia was found. (ATIII + PRS and FVL HO + PRS)

Conclusion While regarding the frequency of FVL (16%) and inhibitor deficiency (8%) the results are in accordance with the results of the relevant previous studies, the occurrence of PRT gene mutation in this study (2.7%) is lower than in other populations.

Neurological education

P 1201

Effects of educational program on hypertension knowledge and ambulatory blood pressure in hypertensive patients with a history of stroke

G. M. Kozera[1], A. Kosmol[2], R. Szczech[2], K. Narkiewicz[2], W. M. Nyka[1], D. Gasecki[1], B. Krupa-Wojciechowska[2], B. Wyrzykowski[2]

[1]Department of Neurology, Medical University of Gdansk, Gdansk, POLAND, [2]Department of Hypertension and Diabetology, Medical University of Gdansk, Gdansk, POLAND

Introduction Long-term hypertension control in majority of patients with a history of stroke is unsatisfactory. Lack of patient education should be taken into account in order to improve hypertension control. We assessed effects of educational programme on basic hypertension knowledge and ambulatory blood pressure (ABPM) control in patients with a history of neurological events.

Methods We studied 19 hypertensive men with stroke or TIA one month prior to the study (age range 37–67, mean 54.3 yrs; 0–1 pts in Rankin scale). All patients participated in the educational programme. The teaching sessions were lead by the specially trained nurses and physicians. We evaluated basic knowledge on hypertension by questionnaire (15 questions) and measured ABPM at baseline and after one year follow-up. Recurrent stroke symptoms, BP self-measurement frequency, regular medication and diet modification were also assessed.

Results Education programme resulted in better hypertension knowledge (questionnaire score 11.5±2.7 vs. 13.0±1.3 points; $P<0.05$). All patients continued regular anti-hypertensive therapy during the follow-up. BP self-measurement frequency increased from 3.4±4.6 to 7.8±5.7 measurements per month ($P<0.05$). Sixteen of 19 patients reduced their salt intake ($p<0.05$). Twenty-four hour ABPM confirmed satisfactory long-term control of hypertension (132±10 at baseline vs. 131 ±11 mm Hg during follow-up for SBP; 83±7 vs. 82±7 mm Hg for DBP). Only one patient presented recurrent stroke.

Conclusion Structured teaching program improves hypertension knowledge in stroke patients, and results in excellent compliance and good long-term BP control. These findings support the concept that educational programmes should be routinely incorporated to secondary stroke prevention in hypertensive patients.

P 1202

Neurology for general practitioners: a new curriculum for advanced training

Y. Alekseenko

Vitebsk Medical University, Vitebsk, BELARUS

Neurological disorders are a matter of importance not only for neurologists but for general practitioners as well. A new curriculum on neurology for postgraduate advance training course for general practitioners is being worked out. The main goal of this short-term (two-weeks) course is to provide physicians with an efficient level of knowledge and practical skills for general and primary care practice which might be enough to manage some most common neurological disorders and frequent emergencies.

The general curriculum outline embraces theoretical and practical parts, using nosologic and syndromic approaches. Included in the curriculum are backgrounds of neurological examination, main neurological syndromes and neurological diseases. The problem-focused neurological examination that all trainees learn to perform should be incorporated into a general physical examination as a routine procedure. The main attention must be given to disorders that are common, preventable and treatable (cerebrovascular pathology, low back pain and lumbosacral radiculopathy, neuropathies, epilepsy, head injuries, toxic and metabolic disorders, etc). Besides all physicians have to deal with assessment and initial management of comatose patients and patients with disorders of consciousness, sudden headache, dizziness and vertigo, gait disturbances, seizures and syncope, acute muscle weakness, etc. Different teaching methods can be applied: Problem-focused lectures, workshops, demonstrations, clinical rounds, conferences and case reports. The course should be completed by computer tests, evaluation of practical skills, discussion of some questions and solving clinical case problems.

P 1203

Survey of the accuracy of information on the apparently credible websites related to neurology

S. R. Lukic[1], Z. M. Cojbasic[2]
[1]University Clinical Centre Nis, Clinic of Neurology, Nis, YUGOSLAVIA, [2]University of Nis, Faculty of Mechanical Engineering, Nis, YUGOSLAVIA

Purpose We determined the relation between credibility features and contents accuracy of websites that provided information on neurology health topics.
Methods Websites were identified either by searching each of the most commonly used search engines or by simultaneously consulting them using a meta-search engine. We selected English language websites. We each provided a subjective judgment of the overall quality of a site (score out of 10). Then we calculated an average score for each site, and analysed first 20 sites.
We assessed the credibility features of the web sites: evidence hierarchy, source and currency as well as accuracy of contents. Relation between features of web site credibility and level of accuracy of contents were expressed by cross tabulation. The strength of association was assessed with Kendall's rank correlation, which adjusts for tied ranks in the data.
Confidence intervals (CI) and significance levels were calculated for alpha=0.05.
Results In selected cases, 45% (CI 23.06% – 68.47%) websites described currency, 65% (CI 40.78% – 84.61%) source and 20% (CI 5.73% – 43.66%) evidence of hierarchy. Kendall's rank correlations were 0.17, 0.27, and 0.17 for the source, currency, and evidence hierarchy respectively, without significance level.
Conclusions Our study shows that features of website credibility have moderate correlation with accuracy of information in neurology health topics. Websites with description of credibility features tended to have higher levels of accuracy of contents, but this relationship was not strong. Thus, apparently credible websites may not necessarily provide higher levels of accurate health information.

P 1204

Delivery of neurological care in Europe

F. Jungmann
Neurologist, Saarbrücken, GERMANY

The UEMS neurology section was anxious to determine patterns of delivery of neurological care in Europe, particularly in regard to systems of private and public funding of the speciality. There are many overlaps of public and private medicine, hospital and office medicine. A complete overview and a consensus on definitions and concepts are not possible. Differences are in administration, intensity of care, severity of illness, and freedom of decision-making, manpower, brainpower, and money power. In Europe, the vast majority of neurologists work in hospitals. In 5 out of 14 countries, neurologists in private office play a major role in out patient care. In 7, they do not. Group offices exist in 7 countries. Most neurologists in private practice are privately paid; second line financing is being done by insurance. Income is equal or slightly above income of other comparable university graduates, but there is also a tendency to lower upper middle class. With the exception of France and Germany, all ancillary examinations including neuroimaging and botulinum injections are done in hospital. In many countries, neurologists in private practice have no major role in relation to inpatient or outpatient health care in medical institutions. There appears to be very little competition between those in private practice and hospital or institutional medicine. Out of hospital, neurology – as a private office or a consortium of specialists – may well have a greater role in patient care. It is closer to ambulatory patients; it might be more economical and flexible for them. Both areas have to be evaluated more thoroughly.

P 1205

Manpower situation in European neurology

F. Jungmann[1], R. Galvin[2]
[1]Saarbrücken, GERMANY; [2]Department of Neurology, Cork University Hospital, Wilton, Cork, IRELAND

The UEMS neurology section/board was anxious to determine manpower levels of neurologists in Europe. This was done by means of a questionnaire to the national specialist delegates. There was large variation in the numbers of neurologists in the different countries varying from 1:7,500 to 1:320,000 of population. These figures are difficult to explain on the basis of the present study. They may be partly accounted for by different patterns of referral (direct versus through a primary physician) and by different spectra of disease treated by neurologists in different countries. The figures are discussed on the basis that neurologists best manage all neurological diseases and that patients are entitled to easy and rapid access to the specialty. On this basis, a reasonable number of neurologists would be in the range of 1:25.000 – 40,000 and probably better at the lower end of this range. This problem merits more study that is detailed.

P 1206

The EFNS Education Committee

W. Grisold[1], J. Afrá[2], M. Donaghy[3], R. Galvin[4], P. Kalvach[5], J. M. Lopes Lima[6], E. Sipido[7], E. Müller[8]
[1]Neurological Department, Kaiser Franz Josef Spital, Vienna, AUSTRIA, [2]National Institute of Neurosurgery, Budapest, HUNGARY, [3]Department of Neurology, University of Oxford, Oxford, UNITED KINGDOM, [4]Department of Neurology, Cork University Hospital, Wilton, Cork, IRELAND, [5]Neurological Department, Hospital St.Antonio, Porto. PORTUGAL, [6]Department of Neurology, 3rd Medical Faculty, Prague, CZECH REPUBLIC, [7]EFNS Branch Office, Florence, ITALY, [8]EFNS Head Office, Vienna, AUSTRIA

The EFNS Education Committee is planning on educational items for the future, assessing education in neurology in East and West European countries and to contribute to harmonize local and national aspects in particular with the UEMS (Union Européenne des Médecins Spécialistes)
Pregraduate education:
Pregraduate education is an important aspect of neurology training. Presently in many countries, the numbers of hours dedicated to neurology are still low. A guideline about the basic neurology training for students will be elaborated. Also, the exchange of students will need support. Cooperation with the "European Federation of Medical Students" will be sought.
Postgraduate education The 2nd draft of the core curriculum for specialist training programme in neurology has been distributed, and will be submitted to the European Journal of Neurology. Also, the UEMS – EBN Chapter n° 6, the Charter on training of medical specialists was updated in 2001.
OFTEN – Open facilities for training in European neurology is a list of high quality departments that are willing to receive trainees from abroad (on UEMS/EBN Website).
A charter for visitation of training centres, can be viewed on the UEMS website.

Training courses with the EFNS Academy for young neurologists and trainees have become an institution.
Much structural input was obtained at the "Trest meeting", which was first held in 2000, and to which 15 East European countries / 5 PAX from each country, were invited. *Department – Department Co-operation:* The department-to-department programme shall facilitate visits from neurologists from the East at Western departments.
CME The Education Committee has developed guidelines for European approval of CME in neurology. (www.efns.org) and is in close co-operation with UEMS – EACCME.
New input can be expected from a tendency to shift from CME to CPD (continuous Personal/professional development), which will change the future continuous education from the "classic" passive participation (lectures, courses) into more active methods (reading, teaching, online education). This movement can be seen as an influence of consumerism on the social context of medical services.
Migration All topics related not only to national problems, but also international and migrational aspects. This will be of vital importance for the new EU member states and their connection in the medical fields.
Health groups Future educational activities within the EFNS will not be strictly confined to physicians. The Education Committee suggests that health groups, patient oriented organisations will be an integral part of future neurology education. An already established link is the EFNS Liaison Committee/EFNA (European Federation of Neurological Associations – patient/lay organisations).

P 1207

UEMS Neurology Section on-line forum

R. Galvin
Department of Neurology, University Hospital, Cork, IRELAND

The neurology section/board of the UEMS has developed a website to facilitate communication between members of the UEMS and their affiliates. For the first time, colleagues will be able to benefit from each other's experience and knowledge in an easy to use forum that will serve as a central repository for information. The site has been designed for both broadcast and individual communications, of simple messages as well as office documents. The main features of this website are:
(1) A staggered security model allowing different groups of people to view and insert different data depending on their level of authorisation.
(2) A document archive with facility to post documents online, including minutes and published UEMS papers. A searchable archive is planned in future development.
(3) An automated mailing facility enables users to broadcast emails to registered members.
(4) A discussion forum allows the exchange of public and private messages and review of posted documents.
(5) "Uems.org" email addresses can be set up for individual members and can forward messages to their current email addresses.
(6) Member contact details are listed for all members with varying levels of access for different website visitors.
(7) A section is devoted to details of training institutions willing to facilitate movement of young neurologists in Europe.

P 1208

Understanding the neurologist's way of thinking An educational framework for the instruction of neurological reasoning

N. C. Veltman[1], A. Keyser[2], P. F. de Vries Robbé[1]
[1]Department of Medical Informatics University Medical Centre St. Radboud, THE NETHERLANDS, [2]Department of Neurology, University Medical Centre St. Radboud, THE NETHERLANDS

Introduction In academic medicine emphasis exists on the teaching of diagnostic reasoning with students and interns (1). Two frameworks for diagnostic reasoning are being used to this end in our medical institution, Clinical Problem Analysis (CPA) in a general sense (2) and the Clinical Method of Neurology (CMN) more specifically for neurology (3). However, they are taught independently of each other. For a complete understanding and comprehensive teaching of this important characteristic of medical practice an integrated view is demanded.
Methods The CPA model of diagnosing in general medicine and the CMN model of diagnosing in neurology are described and compared using a two dimensional "matrix of concepts" with the various identified steps within the two models set out on the horizontal and vertical axes of the matrix respectively.
Results It is found that CPA defines the procedural characteristics of diagnostic reasoning (syntax), while CMN defines the characteristics of the neurological content of diagnostic reasoning (semantics).
Conclusion Based on this result a two-dimensional grid can be generated which defines diagnostic reasoning in neurology in a complete and comprehensive manner. We believe that the use of this framework in medical education will assist in the development of a well-structured neurological knowledge base with students which they can apply to any neurological case.
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