

Neurorehabilitaion
Neurotraumatology

P 1121

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

E. I. Gusev¹, A. I. Grigoriev², A. B. Guekht¹,
I. B. Kozlovskaya², G. V. Serkin¹, E. S. Chickina¹,
D. V. Galanov¹

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.

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

K. Fheodoroff, H. Kattner, H. Wanger, W. Fässlacher, M. Freimüller

Gaital-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-shelf 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.

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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.

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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 patientsB. Stocker¹, M. Gull², H. Zauner¹, C. Haider¹, J. Langle¹, P. Duncan², A. Gassner¹¹Neurorehabilitation Centre Grossgmain, AUSTRIA²University 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.

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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 ≥ 0.50 m g/l (OR 10.8, 95% CI 2.6–44.5), skull fracture (OR 9.2, 95% CI 2.5–33.3), dizziness (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.

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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. Niklas¹, D. Brock², R. Schober³, D. Clark¹, A. Schulz¹, D. Schneider¹¹University of Leipzig, Department of Neurology, Leipzig,GERMANY, ²Praxisklinik am Johannisplatz, Leipzig,GERMANY, ³University of Leipzig, Department of Neuro-pathology, 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.

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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. Krujick 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. Birbamer¹, F. Gerstenbrand²

¹Klinik Angermühle, Deggendorf, GERMANY, ²Ludwig 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.

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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 injuryR. Formisano¹, R. D. Voogt², V. Vinicola¹, F. Penta¹, P. Stanzione^{1,3}, A. Peppe^{1,3}¹I.R.C.C.S. Santa Lucia, Rome, ITALY, ²Robert Voogt and Associates, Virginia Beach, VA, ³Neurological 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 (MTBI) with concomitant alcohol intoxication (AI) is usually a challenge. We analysed the influence of mild and moderate AI on the neurophysiological mechanisms of MTBI and its main clinical features.

Method This study embraces 91 males with MTBI (aged 16–39). In 61 patients an accident took place on the background of mild and moderate AI (MTBI+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 MTBI+AI patients demonstrated more extensive disorders of consciousness and more frequent traumatic amnesia (88%), especially anterograde amnesia (67%) in comparison with MTBI patients without AI. At the same time MTBI+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 MTBI patients without AI versus that in controls during at least two weeks. In MTBI+AI patients we observed only insignificant and short-term increase of P300 latency.

Conclusion Concomitant mild and moderate AI in MTBI patients is associated with more frequent amnesia and therefore complicates the diagnosis of trauma. But amnesia itself is a valuable diagnostic criterion of MTBI 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 nerveY. A. Chelyshev¹, A. A. Bogov², R. F. Masgutov¹¹Kazan State Medical University, Kazan, RUSSIAN FEDERATION, ²Tatarstan research centre Restoration traumatology and orthopaedics, Kazan, RUSSIAN FEDERATION

Objective Investigation of the effect of peripheral nerve intra-operative 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 reportJ. Opara^{1,2}, B. Grabarczyk², D. Gustowski², M. Sklorz²¹Politechnika 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 (Zigmond & 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 algescic syndrome, predominated. Bio-resonant 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. Chang¹, S. Wei², R. K. Shields³, Y. Jong⁴

¹Chang Gung University, Tao-Yuan, TAIWAN REPUBLIC OF CHINA, ²Yang Ming University, Taipei, TAIWAN REPUBLIC OF CHINA, ³The University of Iowa, Iowa City, IA, USA, ⁴Da-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 hospi-

ces, 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.

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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

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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. Raicevic¹, L. Markovic², A. Radosavljevic², T. Lepic¹, N. Rajsic¹, S. Petkovic¹

¹Department of Neurology, ²Department of Radiology, Military Medical Academy, Belgrade, YUGOSLAVIA

P 1149

New classification of severe brain injury

G. Birbamer¹, F. Gerstenbrand²

¹Klinik Angermühle, Deggendorf, GERMANY, ²Ludwig Boltzmann Institute for Restorative Neurology, Vienna, AUSTRIA

P 1150

Pelotherapy in immunologic rehabilitation of patients with diabetic polyneuropathy

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

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Painful torticollis unresponsive to botulinum toxin following thyroidectomy

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

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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

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Cancelled

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

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