

Abstracts provided by authors in order of presentations of lectures

EARLY PHYSIOTHERAPEUTIC DIAGNOSIS IN CHILDREN WITH DEVELOPMENTAL DISORDERS

Ewa Gajewska

Department of Developmental Neurology, University of Medical Sciences, Poznań, Poland

The early physiotherapeutic assessment of spontaneous motor activity involves a thorough analysis of posture and movement, which can be observed in a patient when making the diagnosis of the quantitative and qualitative development. The aim of the study is to show early physiotherapeutic diagnosis in children with developmental disorders. The functional diagnosis consists of observation of motor development (quantitative and qualitative), social interaction, reflexes but also the impact risk factors. The quantitative assessment of motor development is used to determine the global pattern, i.e., the highest level of motor activity achieved at a given moment in life. It is the most advanced function (also known as a milestone), which is exhibited by a child at a given moment in the child's development. This function does not always have to be performed perfectly; it is sufficient that the child manifests it in any way or at least strives to perform it (ideomotor assessment). Another important step in the assessment of motor development is to determine the partial pattern, i.e., the qualitative assessment. It is the assessment of the individual partial patterns (elements) that make up one global pattern. It may be stated that the assessment of the partial pattern is the accurate analysis of the kinesiological content of movement patterns. An ideal ontogeny, i.e., the development of an individual is a kind of a matrix, which can be addressed by analyzing the quantitative and qualitative motor development. The motor development to proceed in a proper manner, certain conditions must be met, such as a genetic determinant, normal mental development, a properly functioning nervous system (CNS), and the senses. This means that all motor patterns and the process of the maturation of the central nervous system are genetically encoded. A genetically-based modification changes the entire motor program of a human. Proper mental development results in a child performing a given task or function as a consequence of motivation, and new motor patterns that occur in the process of development allow for the fulfillment of clearly defined needs.

Keywords: physiotherapeutic diagnosis, developmental disorders

SHOULD WE TRUST WHAT PEOPLE DECLARE ABOUT THEIR PHYSICAL ACTIVITY?

Roksana Jedynek, Magdalena Sobieska

Department of Physiotherapy, University of Medical Sciences, Poznań, Poland

The aim of the research was to assess whether the awareness of the need was accompanied by declared and actual activity. The research included a total of 34 students from the Medical University and Technology University in Poznań. The respondents first completed the questionnaire, which assessed the level of declared activity. In order to verify the actual

level of physical activity, the students measured the number of steps taken for 30 days using a pedometer application downloaded on a mobile phone. Students were also asked to record additional activities. The research has shown that students were aware of the need for physical activity and the main reason for taking it was health benefits. Students didn't achieve the recommended level of physical activity. Medical students showed a higher need for activity, and their level of activity was actually higher compared to technical students. Medical students also more often undertook additional activities. In the case of women (medical and technical students), the declared activity was comparable to the actual activity. However, in the case of men (technical students), the level of declared activity didn't coincide with the actual activity. In the group of technical students, women presented a higher level of physical activity than men. In the group of women (medical students), the factor determining the level of physical activity was age, while in the group of men (technical students), the BMI index. The most common limiting factor was lack of time.

Keywords: physical activity self-reporting, measurement of physical activity, awareness of physical activity need

NEUROPHYSIOLOGICAL EXAMINATION FROM THE PERSPECTIVE OF TREATMENT OF BACK PAIN SYNDROMES

Łukasz Kubaszewski

Department of Spine Orthopedics, University of Medical Sciences, Poznań, Poland

Back pain syndromes are a contemporary, significant health problem of our society. Diversified etiology and clinical presentation, along with limitations of the possibilities of therapy, make it necessary to develop knowledge in the field of diagnostics. In the diagnosis of spine diseases, neurophysiological research has a long history but also undoubtedly an indisputable place in the future. The presentation covers neurophysiological diagnostics of back pain syndromes in terms of decision-making processes in both conservative and invasive treatment. In everyday clinical practice, it is important to understand the possibilities offered by neurophysiological examination, but also to be aware that the basic symptom, which is pain, has so far eluded the possibility of an objective assessment. An increasingly better understanding of the pathology of the nervous tissue of the peripheral system and, in particular, neuropathy enables better prognosis to be defined depending on various forms of therapy. At the same time, the availability of modern minimally invasive forms of therapy in many cases makes it possible to avoid unnecessary classical surgical procedures.

Keywords: back pain, degenerative disease, neurophysiology, neuropathy, spine

STRATEGIES FOR COMPREHENSIVE STROKE REHABILITATION

Dagna Dreczka

Department of Rehabilitation and Physiotherapy, Poznań University of Medical Sciences, Poland

Stroke is the leading cause of severe disability. The consequences of stroke depend on the location and size of the brain lesions. The symptoms may include paralysis or hemiparesis, swallowing disorders, paresis of the muscles of the face and half of the tongue, speech disorders,

disorders of cognitive functions, hemianopia, disorders of body posture and positioning of the limbs, gait disturbances, spasticity, depression, reduction of independence in activities of everyday life. Due to the multitude of impaired functions after stroke, a comprehensive, multidisciplinary approach is required in rehabilitation. The time to start rehabilitation is important - according to the principle, the sooner, the better. The most intense improvement in function occurs in the first months after stroke. Stroke rehabilitation is based on activities aimed at stimulating the phenomenon of neuroplasticity. A comprehensive rehabilitation program requires an individual program of rehabilitation exercises, supported by physical modalities therapy as well as occupational therapy, speech-language therapy, and neuropsychotherapy. Particular attention must be given to the methods for which there is evidence of effectiveness confirmed by scientific research, such as CIMT therapy, task-oriented training, mirror therapy, electrical stimulation, rTMS, robot-based training, and treadmill training.

Keywords: stroke, rehabilitation, neuroplasticity, neurologic rehabilitation

FUNCTIONAL ASSESSMENT OF STROKE PATIENTS

Agnieszka Wareńczak

Department of Rehabilitation and Physiotherapy, University of Medical Sciences, Poznań, Poland

SUMMARY

Stroke is one of the causes of adult disability. As indicated by numerous studies, properly conducted rehabilitation may positively affect the recovery of functions lost due to a stroke. A stroke can cause many symptoms. The effects of stroke may range from mild to severe disabilities. It is not enough to know the diagnosis to effectively help the patient and create a good rehabilitation program adapted to the patient's functional state. A functional test should therefore be carried out before starting the rehabilitation process. Patients are usually assessed on several scales, including functional scales (ADL scale, Barthel index), balance and gait tests (Timed Up & Go test, functional reach test, Berg balance scale, Tinetti test), scales for the assessment of motor functions (Fugl-Meyer Motor Assessment Scale). The analysis of the obtained results is needed to determine the degree of deficits in the patient and to establish short- and long-term treatment goals. Often the same tests are repeated after the rehabilitation has been carried out to document the improvement or lack of progress in the patient's condition. This paper aimed to present current knowledge of functional assessment of stroke patients.

Keywords: stroke, functional assessment, balance

CAN DIETARY INTERVENTIONS AID IN TREATMENT OF AUTISM SPECTRUM DISORDER?

Gabriela Kędzia¹, Aleksandra Sidor^{1,2}, Piotr Poniewierski^{1,3}, Anna Kostiukow³, Włodzimierz Samborski³

¹Neurodevelopmental Student Scientific Society, Poznań University of Medical Sciences, Poland

²Student Scientific Club of Clinical Dietetics, Department of Treatment of Obesity, Metabolic Disorders and Clinical Dietetics, Poznań University of Medical Sciences, Poland

³Chair and Department of Rheumatology, Rehabilitation and Internal Diseases, Poznań University of Medical Sciences, Poland

Introduction

Autism Spectrum Disorder (ASD) manifests itself as impaired speech and language capability, mental retardation, learning, and motor dysfunction. ASD is a significant social problem, and the number of people with autism is increasing. Therefore, it is necessary to look for new therapeutic methods. Dietary interventions as an adjunct to treatment could be a simple and inexpensive method. In this review, we examine the possibility of using diets in therapy in ASD.

Aim

Assessment based on a review of scientific papers on dietary interventions in Autism Spectrum Disorders.

Material and method

This review was created on the basis of a systematic review of articles, which were searched using the browsers: PubMed and Research Gate. The search terms were: "diet in ASD", "dietary interventions in Autism Spectrum Disorder", "Autism Spectrum Disorder", "Therapies in ASD".

Results

We received a total of 277 results. We rejected all scientific publications that were inconsistent with the subject of our work and all in a language other than English. We only considered reliable scientific sources.

Conclusions

Diet in autism spectrum disorders is an important aspect of treatment. The most commonly used diets are the ketogenic diet (KD), the gluten-free, and casein-free (GFCCF) diet. Supplementation of omega 3 fatty acids and methyl-B12 vitamin is also used. Children with ASD often suffer from disturbed intestinal microbiota. There is evidence that dietary treatment can aid the therapy of ASD. Their number is relatively small and requires further research.

Keywords: ASD, diet, supplementation

DISTURBED POTASSIUM HOMOEOSTASIS AS A TRIGGER OF OUT-OF-HOSPITAL CARDIAC ARREST (OHCA)

Bartłomiej Czyżniewski, Iga Kolasa, Magdalena Gibas-Dorna

Department of Applied and Clinical Physiology, Collegium Medicum, University of Zielona Góra, Poland

Severe hypokalaemia may lead to cardiac arrest caused by pulseless electrical activity (PEA), ventricular fibrillation (VF), pulseless ventricular tachycardia, or asystole.

A 57-year-old man with a history of mild hypertension, treated with valsartan and hydrochlorothiazide, experienced non-traumatic OHCA during basketball training. He was resuscitated successfully, however, he remained in a coma for a few days. According to Glasgow Coma Scale, he was diagnosed as having a severe brain injury. On admission day, potassium level was 2.8 mmol/l. Because of high troponins, he underwent immediate coronary angiography, which did not show any evidence for coronary artery occlusion. Eeg, head CT, ECG, echocardiography, and laboratory tests did not show any significant disturbances. On day 4th, he woke up and was extubated.

A week later, he was able to walk with assistance. Two days later, the patient was discharged from the hospital. The post-hospital rehabilitation was not refunded by the National Health Fund. 7 weeks after OHCA, an MRI examination showed mild cortical atrophy in the frontal and parietal lobes and indicated the possibility of empty sella syndrome. The patient was consulted by an endocrinologist and referred to the clinic of endocrinology.

After 5 months from OHCA, the diagnostic process is not completed, the patient has persistent cognitive and memory deficits, and rehabilitation is still ongoing.

Conclusions:

1. Blood tests during routine check-ups must include electrolytes in physically active patients receiving valsartan and hydrochlorothiazide.
2. Patients diagnosed with OHCA in a hospital with little infrastructure should be transferred to a well-equipped and experienced care center for detailed causative diagnosis.
3. National Health Fund should support survivors after OHCA with no other comorbidities, with publicly funded immediate rehabilitation.
4. Data regarding OHCA survivors in Poland are scarce, and well-coordinated procedures regarding rehabilitation and reintegration of patients into the productive life of the community are necessary.

Keywords: potassium homoeostasis, cardiac arrest

THE ROLE OF SPINAL MANIPULATION IN MIGRAINE AND HEADACHE MANAGEMENT: A COMPILATION OF CASE STUDIES

Chanika Assavarittirong¹, Melinda Pham², Tsz Yuen Au¹

¹Poznań University of Medical Sciences Center of Medical Education in English, Poznań, Poland

²Life Chiropractic College West, CA, USA

Introduction

The International Classification of Headache Disorder 3 (ICHD3) classifies migraine as one of the primary headaches. It includes the subclassifications of chronic, probable, and episodic migraines. Affected individuals' experiences of each migraine attack can vary differently. Severe headache, and neck stiffness are the commonly reported symptoms. Chiropractic care is often sought for pain relief in addition to medications. More than 87% of chiropractors reported being treating patients with headache-related complaints. Randomized Clinical trials studies suggested that spinal manipulation may play a role in activating the descending pain inhibitory pathways in migraines.

Aim

To explore the outcomes of spinal manipulation via chiropractic adjustments in the management of migraine and headache from case studies compilation.

Materials and methods

Clinical case reports and an observational pilot study of 17 cases about treating chronic migraine with spinal manipulation and other types of headaches from 2011 to 2021 were gathered utilizing the PubMed database to evaluate the effectiveness of treatment.

Results

In the case compilation, 11 out of 17 patients experienced alleviation of migraine pain and other associated symptoms after chiropractic care. Additionally, spinal manipulation showed positive outcomes of relieving rare cases of headaches such as Neck and Tongue syndrome.

Conclusions

Spinal manipulation shows promising outcomes in the management of migraine headaches in addition to traditional therapy. Many patients also sought other modes of treatment, including medication, massage therapy, and acupuncture. Future clinical trials should be performed to generate more understanding of the spinal manipulation mechanism in migraine management.

Keywords: spinal manipulation, migraine and headache management

BRAINS IN SPACE – HOW DOES SPACE AFFECT HUMAN BRAIN?

Arkadiusz Kołodziej

Medical University of Warsaw, Poland

Nowadays more and more people and international companies are interested in Human Spaceflights. We are aware of factors that impact human physiology in space, but some questions still remain unanswered, especially in terms of space neuroscience. In this presentation,

the negative effects from space radiation, microgravity, and the factor of isolation on the central nervous system will be described in relation to space neuroscience and the relevant studies examined.

Space radiation can damage neuronal connections, demonstrated in mice with both acute and chronic effects, manifested as altered cognitive function, reduced motor function, and behavioural changes. All of the above alterations can have a detrimental effect upon space mission safety and astronauts' wellbeing.

Moreover, some astronauts report a condition known as Spaceflight Associated Neuroocular Syndrome (SANS). The brain scans performed upon those astronauts who came back from space travel suggest that due to reduced gravity conditions the brain, and the fluids in the human body shift upwards, which increases pressure in the skull and may result in optic-nerve swelling that causes blurred vision.

Another interesting part of space neuroscience is the research of structural neuroplasticity after spaceflight. A study conducted on cosmonauts revealed an increase in GM (Gray matter) tissue in the basal ganglia and WM (White matter) tissue in the cerebellum, so sensorimotor structures responsible for movement coordination. What is compelling is that those changes persisted seven months after spaceflight. In addition to space radiation and microgravity, long-term confinement also affects the microstructure of the brain white matter, which was proven in the study that used the DTI (Diffusion Tensor Imaging) method and revealed changes that suggest underlying processes of neuroplasticity.

To conclude, to continue understanding the risks posed by spaceflight to astronauts' health and ensuring mission success, research in the field of space neuroscience is important. In addition, the acquired insight could be relevant for terrestrial vestibular patients, patients with neurodegenerative disorders, as well as the elderly population coping with neurological deficits.

Keywords: human brain, space flights

BRAINSTEM ENCEPHALITIS ON THE BACKGROUND OF LYME DISEASE – A CASE REPORT

Filip Kamiński, Marta Miejska
Students' Scientific Group of Neurology
University of Rzeszów

Introduction

Lyme borreliosis is an infectious disease caused by a Gram-negative *Borrelia* bacterium, which is spread to humans by the bites of infected ticks of the genus *Ixodes*. The most common sign of infection is *erythema migrans*, which occurs in 1–4 weeks after the tick bite. Neurological signs can be noticed soon after infection; they can relate to both central and peripheral nervous systems.

Brainstem encephalitis or rhombencephalitis refers to inflammation in the brainstem and cerebellum. It has a variety of etiologies, which include viral infection, bacterial infection, autoimmune disease, and paraneoplastic syndromes. Bacteria *Listeria monocytogenes* are the most common cause of infectious rhombencephalitis. Borreliosis can also result in brainstem encephalitis but is a very rare cause of this condition.

Case description

We herein report a case of rhomboencephalitis caused by Lyme disease in a 66-year-old man.

He was admitted to the Neurology Department with a history of chronic dizziness, imbalance, and the impairment of memory lasting for approximately 2 months. His medical history included mostly gastrointestinal diseases such as functional bowel disorder, diverticular disease of the colon, and hemorrhoids. The patient underwent a thorough examination. During the neurological examination, he was observed with nystagmus, disturbed attention, and retardation. EEG revealed an abnormal record of brain activity. The cerebrospinal fluid analysis revealed Anti-Borrelia antibodies, which were also detected in the patient's blood. The computed tomography of the head showed inconclusive hypodense zones in the midbrain and centrally in the structures above. The patient was treated with anti-infectives, anti-edema drugs, methylprednisolone, and cefalosporin 3rd gen. Due to the fact that after the treatment, his condition got better, succeeding EEG record revealed improvement in the brain function, and because of Anti-Borellia antibodies found in the CSF patient was diagnosed with neuroborreliosis. However, because of the fact that magnetic resonance imaging findings were nondistinctive, he required a follow-up examination. After 3 months patient returned to the hospital for a scheduled visit. He defined his condition as significantly better. The control MRI showed almost complete regression of the previously described changes, however, the features of a significant cerebellar cortical atrophy drew attention.

Conclusions

Various causes of brainstem encephalitis have been described previously, but rhombencephalitis triggered by Lyme disease is quite rare. In the differential diagnosis of every disease, it is important to take into consideration not only the most common etiological causes but keep an open mind for other triggers. Each case should be treated individually. Both laboratory results and imaging examinations are important and together lead to the correct diagnosis. In the studied case, appropriate treatment, conducted due to symptoms, lab, and imaging outcomes, results in regression of brainstem inflammation.

Keywords: brainstem encephalitis, Lyme disease

PRACTICAL CLINICAL IMPLICATION OF COMPARISON OF THE PRE- AND INTRAOPERATIVE MOTOR EVOKED POTENTIALS RECORDINGS IN PATIENTS WITH SURGICAL CORRECTION OF ADOLESCENT IDIOPATHIC SCOLIOSIS

Anna Garasz^{1,2}, Juliusz Huber¹, Magdalena Grajek², Piotr Janusz³, Paweł Główka³, Marek Tomaszewski³, Tomasz Kotwicki³

¹Department of Pathophysiology of Locomotor Organs, University of Medical Sciences, Poznań, Poland

²Faculty of Physics, Adam Mickiewicz University, Poznań, Poland

³Department of Spine Disorders and Pediatric Orthopaedics, University of Medical Sciences, Poznań, Poland

Background and aims

The value of motor evoked potentials (MEPs) in the evaluation of efferent transmission within spinal cord tracts during neuromonitoring associated with spine surgeries is undeniable. The vast majority of studies devoted to the surgical correction of adolescent idiopathic scoliosis (AIS) describe MEPs parameters that in general should prove the absence of side effects caused by correction procedures- distraction, derotation, etc., either implant positioning or corrective maneuvers. The aim of this pilot study is twofold. Is there any relationship

between pre- and intraoperative motor evoked potentials recordings, and does AIS surgical correction effects on improvement of spinal efferent transmission?

Subjects and methods

The pilot study included 13 patients (11 females and 2 males; aged 6 to 19 years) with right thoracic AIS (Th2-L1; Cobb's angle 45–90°). Preoperatively, the MEPs recordings were evoked with a magnetic stimulus (T0; transcranially with 80% of maximal stimulus output – 1.7T) while intraoperatively with trains of electrical stimuli (T1 – before and T2 – after scoliosis correction; 180–200mA) and recorded from anterior tibial muscles on both sides.

MEP parameter	T0 (preoperative)		T1 (intraoperative before correction)		p T0-T1		T2 (intraoperative after correction)		p T1-T2		p T0-T2	
	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
Amplitude (μV)	642	653	492 ↓	434 ↓	NS	NS	711 ↑	588 ↑	0.04	0.03	NS	NS
Latency (ms)	33.9	34.5	29.5 ↓	30.2 ↓	0.03	0.03	29.5	30.5	NS	NS	0.03	0.02
Duration (ms)	20.7	22.7	26.7 ↑	26.9 ↑	0.03	NS	28.5 ↑	28.7 ↑	NS	NS	0.03	0.01

Results

In general, the parameters of MEPs amplitudes induced with magnetic field preoperatively (T0) did not differ significantly from those induced with trains of electrical pulses before surgical correction of scoliosis (T1). Immediately after scoliosis correction, a significant increase was observed (T1-T2). The latencies of MEPs were longer, and durations were shorter preoperatively in T0. The surgical correction resulted in significant changes in MEPs amplitudes recorded from TA muscles on both sides of scoliosis (T2), while no changes in latencies and durations were recorded. On the other hand, the surgery changed the efferent transmission in spinal pathways by means of the latency's parameters decrease and duration increase when compared in T0-T2.

Discussion and conclusions

Considering that MEPs amplitude parameter reflects the number of axons excited from the motor cortex and transmitting the efferent impulses via descending spinal tracts in lateral white matter, pre- and intraoperative recordings are reliable tools evaluating the patient's neurological status before introducing surgical procedures of scoliosis correction. Immediate increase of MEPs amplitudes on both sides after scoliosis surgery indicates improvement of efferent spinal transmission. Considering pre- and postoperative recordings, significant shortening of latencies parameter on both sides may confirm the release of the efferent blockade neural transmission.

Keywords: motor evoked potentials, pre- and intraoperative recordings, adolescent idiopathic scoliosis, neuromonitoring, safety in scoliosis surgery

COGNITIVE IMPAIRMENT AND SACCADIC ABNORMALITIES IN PATIENTS WITH ESSENTIAL TREMOR

K. Pelar, J. Tempiski, M. Wójcik-Pędziwiatr, K. Szewczyk

Department of Neurology, Andrzej Frycz Modrzewski Krakow University, Poland

Introduction

Eye movements are a great source of information for both clinicians and scientists as their abnormalities frequently seem to localize a disease process. Eye movement control is complex and involves many brain areas, including the brainstem, cerebellum, basal ganglia, and cerebral cortex. Rapid eye movements that abruptly change the point of fixation are called saccades. Volitional saccades are a sensitive marker in the assessment of cortical areas connected with cognition. Essential tremor (ET) is the most frequent movement disorder. Many studies have proved the presence of mild cognitive dysfunctions supported by frontal regions in ET. To our best knowledge, there are no previous studies to evaluate the relation between saccades and cognition in ET.

Aim of the study

Our study aimed to assess the relation between the abnormalities in volitional saccades and cognitive function in ET.

Methodology

Sixteen ET patients (6 females, 10 males, average age: 55 ± 26 years, average disease duration: 14 ± 11 years) and a control group consisted of 10 healthy subjects matched by age and gender were included to the study. The diagnosis of ET was made according to the National Institute of Health Collaborative Genetic Criteria (1996) and Tremor Research Investigatory Group Criteria. The team has used the Saccadometer Research device (*Ober Consulting, Poland*) to record antisaccades and memory-guided saccades. In order to assess parameters of saccades, both *Ober Consulting's* algorithms and *ResearchAnalyzer* software were used. Correct saccades were classified accordingly to the algorithms developed by *Ober Consulting* and further verified manually, according to criteria used in the previous research. To estimate cognitive function, we implemented a battery of tests, including BVRT, Stroop test, SDMT, AVLT, and many others. For grading the tremor severity, Clinical Rating Scale for Tremor (CRST) was applied.

Results

Antisaccades latency rose with age, disease duration, CREST score, decrease in Stroop test, in Verbal Fluency test, and AVLT test.

Conclusions

Prolonged saccadic latency in ET correlated significantly with disease progression and cognitive decline, especially in terms of verbal fluency, visual-spatial attention divisibility, short- and long-term memory impairments, so this parameter may be very useful in making diagnosis and following the disease progress.

Keywords: Cognitive Impairment, Saccadic Abnormalities, Essential Tremor

CASE REPORT – SULFONYLUREA POISONING MIMICKING VERTEBROBASILAR ACUTE ISCHEMIC STROKE

Kamila Kędra

Department of Medicine, University of Rzeszów, Poland

The aim of our study was to describe the case of the man with sulfonylurea induced hypoglycemia manifesting as acute encephalopathy with focal neurological signs misdiagnosed as posterior circulation acute ischemic stroke (AIS).

A 64-year-old patient treated with glimepiride (2 BID) for type II diabetes mellitus, after radical prostatectomy for prostate cancer was admitted to the Stroke Unit. Upon admission, patient was unconscious, with upward gaze deviation, four-limb paresis, extensor response to pain, bilateral positive Babinski's sign. Non-contrast head CT and CT-angiography did not reveal any abnormalities. Low serum glucose level (46 mg/dl) was noted and corrected with intravenous glucose infusion (80 mg/dl). Based on the acute onset of focal neurological signs, the initial diagnosis of AIS was made. Due to the exceeding of the treatment window, no reperfusion therapy was performed. In further serum glucose measurements, hypoglycemia was noted. For the next 72 hours, repeated intravenous glucose infusions were needed to maintain the levels above 70 mg/dl. Magnetic resonance head imaging performed in 3rd and 7th did not reveal ischemic changes. Hypoglycemic encephalopathy due to glimepiride poisoning was diagnosed. In our case, perioperatively taken sulfonylureas resulted in prolonged hypoglycemia misdiagnosed as AIS. Prolonged insufficient brain nutrition can result in permanent or long-lasting brain damage, manifesting itself as impaired consciousness and focal neurological signs.

Keywords: Sulfonylurea Poisoning, Vertebrobasilar Acute Ischemic Stroke

SPASTIC TETRAPLEGIA, THIN CORPUS CALLOSUM AND PROGRESSIVE POSTNATAL MICROCEPHALY – THE PHENOTYPE OF THE AFFECTED

Marta Andrzejewska¹, Katarzyna Wołyńska²

¹Student Research Group of Medical Genetics, Department of Medical Genetics, Poznań University of Medical Sciences, Poland

²Department of Medical Genetics, Poznań University of Medical Sciences, Poland

Introduction

Spastic tetraplegia, thin corpus callosum, and progressive postnatal microcephaly is an ultra-rare genetic disease arising from biallelic mutation of the *SLC1A4* gene, resulting in deficiency and malfunction of ASCT1, neuronal amino acid transporter. Symptoms reveal in neonacy or infancy, and to these belong microcephaly, muscular spasticity and/or hypotension, psychomotor development retardation, and epilepsy. Neuroimaging shows a thin corpus callosum. To date, approximately 20 cases in the world are known.

Aim

We attempted to describe the strategy of genetic diagnostics, the prevalence, and treatment of symptoms associated with the disease. Moreover, we aimed to characterize the patients' development.

Materials and methods

We created a questionnaire sent to the positive for *SLC1A4* gene mutation subjects' families. It was divided into three parts. The first asked for general information (ethnicity, age of diagnosis, mutation, technique used for diagnosis). We inquired about the symptoms of the disease, the body regions with altered muscular tension with spasticity assessed with the Modified Ashworth Scale, and the treatment of epilepsy. The third part concerned the development of speech, walking, and eating abilities.

Results

We obtained 16 answers. Mean age of the group is 9.2 years, while mean age of diagnosis is 5.8 years. 81.3% patients (n = 13) were diagnosed thanks to whole exome sequencing. 93.8% (n = 15) patients have microcephaly, 93.8% (n = 15) – spasticity, while 62.5% (n = 10) hypotonia. Mean Ashworth score is 2.2, while median – 3. 75% patients (n = 12) have thin corpus callosum. 81.3% (n = 13) suffer from epilepsy, 68.8% (n = 11) are treated for it and 66.6% (n = 8) have seizures. Only 12.5% (n = 2) subjects are able of walking. 12.5% (n = 2) patients talk with sentences or words, 12.5% (n = 2) use syllables, 43.8% (n = 7) babble and 31.3% (n = 5) cry only.

Discussion

Whilst reporting at least 2 new cases of the disease, we emphasize the importance of the description of the development of the affected patients. A subject to further research is whether the symptoms' severity correlates with the level of gene expression and protein function.

Keywords: spastic tetraplegia, epileptic encephalopathy, developmental delay

USE OF IMMERSIVE TECHNOLOGIES FOR NEUROLOGICAL POTENTIATION IN NEURODEGENERATIVE DISEASES

Ramy Rick Mitwalli

Poznań University of Medical Sciences, Poland

As technology advances, so does the average lifespan of humans. This not only entails a more significant burden of diseases on patient lives but also on the resources of our global healthcare ecosystem. Immersive technologies such as Virtual Reality (VR) or Augmented Reality (AR) provide a favorable environment for the care of complex, degenerative neuropsychiatric diseases like never before - whether it be in the diagnosis, treatment, or maintenance. It, more importantly, makes all this possible at a distance; and could potentially redefine telemedicine – which is now more relevant than ever given obstacles brought by the SARS-CoV2 (COVID-19) pandemic.

The main value-adding proposition of implementing immersive technologies lies in its ability to emulate the physical world. Such technology is suggested to offer novel opportunities in stimulating and activating innate neural plasticity as a dynamic neurocognitive training modality. The application of immersive technologies offers a novel approach to engage and potentiate neurological pathways via digitally simulated environments – combining both physical and simulated worlds. This study suggests that combining neuroscience with technology presents unique mechanisms for neurocognitive potentiation. With increasing acceptance and desirability from patients, the application of immersive technology in clinical settings is gaining widespread interest, especially as a non-pharmacological, non-invasive neuromodulation strategy in caring for patients suffering from neurodegenerative diseases.

The notion of combining neuroscience and technology in the management of neurodegenerative diseases is not meant as a curative method. It is meant to be an adjunct therapy; neither a replacement nor substitution for evidence-based pharmacotherapy or behavioral therapy. The primary function is to complement existing treatment plans which aims to reduce the rate of neurodegeneration in patients while offering a novel, alternate perception. All in all, the main idea is to provide extrasensory stimulation for patients in order to alleviate the burden of disease and symptoms while potentially slowing the rate of degeneration and improving patient quality of life.

Keywords: immersive technologies, neurodegenerative diseases

TO FIND A GOLDEN MEAN: SECONDARY STROKE PREVENTION IN A PATIENT WITH MECHANICAL AORTIC VALVE AND UNSTABLE INR LEVELS – A CASE STUDY

Tsz Yuen Au, Chanika Assavarittirong, Aleksandra Lis, Marek Baliński

Department of Cardiology-Intensive Therapy, Poznan University of Medical Sciences, Poznan, Poland.

Background

Cardio-embolism is a well-known cause of ischemic stroke. This is the result of cerebral artery occlusion by clots formed due to the structural or functional heart abnormalities. Patients with prosthetic valves are at high risk of embolism but simultaneously have an excessive risk of bleeding, often cerebral, as a result of anticoagulants adverse events. Because of this, the use of any treatment strategy must be well-balanced.

Case presentation

A 70-year-old male was admitted to the hospital due to chronic heart failure exacerbation. The patient suffers from a wide range of underlying conditions, including heart failure, previous myocardial infarction, hypertension, atrial fibrillation, episode of ischaemic stroke and subarachnoid haemorrhage, renal insufficiency, iron deficiency anemia, and rectal adenocarcinoma. After several days of intensive diuretic therapy, the patient's condition was satisfying. However, providing the proper anticoagulant therapy turned out to be the main challenge. The patient has an artificial valve, which is a contraindication for the new anticoagulant agents. Due to unstable INR levels in the past and undiagnosed origin of anemia, prescribing warfarin was not recommended. During the hospitalization, the patient was receiving enoxaparin. Nevertheless, the cost and form of injections were unacceptable for the patient. Finally, after the patient's re-education about strict INR control and in cooperation with his family doctor, warfarin was tentatively prescribed.

Conclusion

Our case highlights the difficulty of anticoagulation therapy in a patient with multiple underlying conditions in secondary stroke prevention. Monitored randomized clinical trials on utilizing new anticoagulant agents in patients with artificial valves are needed to increase the therapeutic options.

Keywords: secondary stroke, mechanical aortic valve and unstable INR levels