

ABSTRACT BOOK 2016

MIND & BRAIN
56th International Neuropsychiatric Congress



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Program

PROGRAM

Wednesday, June 15th

- 15:00-18:00** **NEUROPSYCHOANALYSIS WORKSHOP**
Bianca Istriana Hall Mark Solms (Cape Town, South Africa)
- 15:00-17:00** **9th International Epilepsy Symposium in Pula**
Belica Hall Chairperson: Hrvoje Hećimović (Zagreb, Croatia)
 Hrvoje Hećimović (Zagreb, Croatia): Emotions and depression in temporal lobe epilepsy
 Marjan Zaletel (Ljubljana, Slovenia): Persons with epilepsy: between social inclusion and marginalization
 Josipa Stipetić Irha (Zagreb, Croatia): Availability in children with cerebral palsy for appropriate health care
 Discussion
- 19:30-20:30** **Academic lecture**
Ulika Hall Mark Solms (Cape Town, South Africa): The dreaming brain

Thursday, June 16th

- 08:30-09:00** **OPENING CEREMONY**
Ulika Hall
- 09:00-09:20** Asim Kurjak (Zagreb, Croatia): Fetal neurobehavior assessed by KANET test
Ulika Hall
- 09:30-11:30** **MAIN THEME NEUROPSYCHOANALYSIS**
Ulika Hall Chairpersons: Mark Solms (Cape Town, South Africa), Stanislav Matačić (Zagreb, Croatia)
 Mark Solms (London, United Kingdom): The Conscious Id
 Francesco Benedetti (Milan, Italy): Neuroimaging of dreams and fantasies: a first step toward investigating incomprehensible first-person experiences
 Vlasta Rudan (Zagreb, Croatia): Development of personality and new technologies
 Stanislav Matačić (Zagreb, Croatia): Psychoanalysis today
- 09:30-11:30** **Cerebral and spinal malformations – diagnosis and treatment**
Belica Hall Chairpersons: Kurt Niederkorn (Graz, Austria), Günther Lanner (Graz, Austria)
 Thomas Gattringer (Graz, Austria): Neurological aspects
 Günther Erich Klein (Graz, Austria): Neurointervention
 Michael Mokry (Graz, Austria): Neurosurgery
- 11:45-13:00** **Mladi psihijatri: Uloga psiholoških tehnika u propisivanju lijekova**
Bianca Istriana Hall Chairpersons: Vedran Bilić (Zagreb, Croatia), Darko Marčinko (Zagreb, Croatia)
 Darko Marčinko (Zagreb, Croatia): Psihodinamika psihofarmakoterapije
 Bjanka Vuksan-Ćusa (Zagreb, Croatia): Granice bipolarnog afektivnog poremećaja i graničnog poremećaja ličnosti (važnost psiholoških tehnika u biologijskoj psihijatriji)
 Prikaz slučaja (sekcija mladih psihijatara) – supervizori D.Marčinko, V.Bilić
 Diskusija
- 11:45-12:45** **MEDIS Satellite symposium - Znanstveni dokazi o primjeni Tecfidere (dimetilfumarata) u kliničkoj praksi**
Ulika Hall Marija Bošnjak Pašić (Zagreb, Croatia): Predstavljanje višegodišnjih rezultata učinkovitosti Tecfidere (dimetilfumarata) u relapsnoj remitentnoj multiploj sklerozi
 Dolores Janko Labinac (Pula, Croatia): Tecfidera – prikazi pacijenata iz kliničke prakse
- 13:00-14:00** **LUNCH**
- 14:00-17:00** **5th European Psychopathology Summer School – Part 1.**
Taverna Hall *Under the patronage of EPA*
 Chairpersons: Martin Brüne (Bochum, Germany), Karl Bechter (Günzburg, Germany), Johannes Schröder (Heidelberg, Germany)
-  Margherita Bechi (Milan, Italy) : Social cognitive and neurocognitive interventions in schizophrenia: raising the bar of functioning
 Martin Brüne (Bochum, Germany): Is Mentalization-based Therapy a useful adjunct treatment to Dialectical Behavior Therapy in Borderline Personality Disorder?
 Anna Buchheim (Innsbruck, Austria): Neural changes in depressed patients during psychodynamic psychotherapy: An fMRI and EEG study using an attachment paradigm
 Break
 Johannes Schröder (Heidelberg, Germany): Neurological soft signs in various psychiatric disorders
 Darko Marčinko (Zagreb, Croatia): Psychotherapy of personality disorders: A contemporary approach
 Martina Rojnić Kuzman (Zagreb, Croatia): Daily hospital setting in the treatment of the first episode of psychosis
 Video case presentations and discussion

Program

14:00-15:40
Bianca Istriana Hall

Emotions and motorical learning
Chairpersons: Osman Sinanović (Tuzla, Bosnia and Herzegovina), Vladimira Vuletić (Zagreb, Croatia)
Osman Sinanović (Tuzla, Bosnia and Herzegovina): Emotions and motorical learning – neurological view
Doris Kutscher Meurer (Neuenkirchen, Germany): The relevance of sensory afferent Input to regain the body schema as a basis for Physiotherapy in Neuro rehabilitation.
Gordana Poščić (Rijeka, Croatia): Negative Consequences of Depression to Recovery of Motor and Cognitive Deficits
Sanjica Vlašić (Zagreb, Croatia): Task-oriented training for patients with involuntary hyperkinetic movements
Marija Miletić (Zagreb, Croatia): Inactivity and Social Isolation in Patients with Parkinson's Disease

15:45-16:30
Bianca Istriana Hall

ABBVIE Satellite Symposium
Vladimira Vuletić (Zagreb, Croatia): Modern Concepts in Treatment of Parkinson's Disease

16:30-19:30
Bianca Istriana Hall

How to write and read papers
Chairpersons: Anton Glasnović (Zagreb, Croatia), Hrvoje Barić (Zagreb, Croatia)

Antonija Paić (Zagreb, Croatia) : How To Write A Well Structured Scientific Article
Anton Glasnović (Zagreb, Croatia): Statistical Reporting For Articles Published In Biomedical Journals
Break
Hrvoje Barić (Zagreb, Croatia): Why Should We CARE About Case Reports
Filip Đerke (Zagreb, Croatia): What makes a good abstract ?

17:30-19:00
Taverna Hall

5th European Psychopathology Summer School - Specifics of forensic psychiatric treatment within – what has to be considered ? - Part 2
Under the patronage of EPA



Chairpersons: Karl Bechter (Günzburg, Germany), Nenad Vasic (Göppingen, Germany)

Đorđe Alempijević (Belgrade, Serbia): Abuse of patients treated in psychiatric facilities and how to deal with it?"
Nadica Buzina (Zagreb, Croatia): Forensic psychiatric aspects of the treatment of persons found not-guilty-by-reason-of-insanity in the Republic of Croatia
Nenad Vasic (Göppingen, Germany): Psychopharmacologic treatment of in-patients with schizophrenia: Comparison between forensic and general psychiatry

Friday, June 17th

09:00-12:00
Ulika Hall

MAIN THEME: NEUROINFLAMMATION & NEURODEGENERATION
Chairpersons: Nenad Bogdanovic (Oslo, Norway) Franz Fazekas (Graz, Austria)
Karl Jürgen Bär (Jena, Germany): The autonomous nervous system in neuroinflammation
Karl Bechter (Günzburg, Germany) The mild encephalitis hypothesis for psychiatric disorders
Francesco Benedetti (Milan, Italy): The role of inflammation in bipolar disorder
Norbert Müller (München, Germany): Therapeutic implications of inflammation in psychiatric disorders.
Break
Franz Fazekas (Graz, Austria): Revisiting the diagnosis of CIS and the implications for therapy
Valeria Caso (Perugia, Italy): Neuroinflammation in Intracerebral Haemorrhage
Nenad Bogdanović (Oslo, Norway): New insights in Neuroinflammation and Alzheimer's disease
Zdravko Lacković (Zagreb, Croatia): Unexpected neurogenic inflammation of meninges as reaction to pain in trigeminal regions

09:00-11:00
Belica Hall

Workshop: Between Neuroradiology and Neurophysiology; New Insights in Neural Mechanisms
Chairperson: Marinko Rade (Rovinj, Croatia, Kuopio, Finland)

10:00-12:00
Taverna Hall

5th European Psychopathology Summer School – 3rd International Sport Psychiatry Meeting - Part 3
Under the patronage of EPA



Chairpersons: Karl Jürgen Bär (Jena, Germany), Valentin Zdravko Markser (Köln, Germany)

Karl Jürgen Bär (Jena, Germany): Neuroendocrinology and neurophysiology of physical activity and high performance sports
Tobias Freyer (Freiburg, Germany): Sports therapy for mental disorders (depression, anxiety, eating disorder, dementia, addiction)
Karl Jürgen Bär (Jena, Germany): Sport specific mental disorders
Valentin Zdravko Markser (Köln, Germany): Sport psychiatry in high performance sports


11:30-12:45
Bianca Istriana Hall

Pristupi razumijevanju i liječenju depresije u Hrvatskoj
Chairpersons: Darko Marčinko (Zagreb, Croatia), Alma Mihaljević Peleš (Zagreb, Croatia)
Alma Mihaljević Peleš (Zagreb, Croatia): Hrvatske smjernice za liječenje depresije
Marina Šagud (Zagreb, Croatia): BDNF i depresija
Maja Bajs Janović (Zagreb, Croatia): Depresija u slikovnim prikazima mozga
Vlado Jukić, Petrona Brečić (Zagreb, Croatia): Zavod za afektivne poremećaje Klinike za psihijatriju Vrapče – od općeg ka konkretnom
Vjekoslav Peitl, Dalibor Karlović (Zagreb, Croatia): Psihoneuroendokrinologija depresije – depresija je bolest cijelog organizma
Željko Milovac, Igor Filipčić (Zagreb, Croatia): Prva iskustva liječenja TMS-om u Hrvatskoj
Diskusija

12:00-12:45
Ulika Hall

MEDIS Satellite Symposium
Silvio Bašić (Zagreb, Croatia): Vimpat (lakoamid) u liječenju epilepsije

Program

- 12:45-13:30**
Bianca Istriana Hall **LUNDBECK Satellite Symposium**
Ante Silić (Zagreb, Croatia): Važnost očuvanja funkcionalnosti pacijenata u ranom tijeku bolesti: uloga dugodjelujućih parenteralnih antipsihotika (LAI) u shizofreniji
Diskusija
- 13:00-14:00**
LUNCH
- 14:00-16:30**
Uluka Hall **MAIN THEME: NEUROREPAIR**
Chairpersons: Vida Demarin (Zagreb, Croatia), Silva Butković Soldo (Osijek, Croatia)
Srećko Gajović (Zagreb, Croatia): In vivo molecular imaging in the evaluation of ischaemic brain lesion in the mouse
Vida Demarin (Zagreb, Croatia): The Role of Neuroplasticity in Neurorepair
Robert Gan (Singapore): Neurorestorative Strategy from Natural Substances: NeuroAid
Lilia Zvyagina (Odessa, Ukraine): Stem cells in treatment of neurodegenerative diseases
Vladimira Vuletić (Zagreb, Croatia): Deep Brain Stimulation in Movement Disorders -is there any neuroprotection?
Silva Butković Soldo (Osijek, Croatia): Neurofeedback in Neurorehabilitation
Vesna Šerić (Zagreb, Croatia): Post-stroke Spasticity
- 14:00-17:00**
Taverna Hall
 **5th Psychopathology Summer School – 3rd International Sport Psychiatry Meeting - Part 4**
Under the patronage of EPA
Sports psychiatry – cases and discussion
Chairpersons: Karl Jürgen Bär (Jena, Germany), Valentin Zdravko Markser (Köln, Germany)
- Discussing psychopathology by video material**
Chairpersons: Francesco Benedetti (Milan, Italy), Karl Bechter (Günzburg, Germany), M. Brüne (Bochum, Germany)
- 16:30-18:00**
Bianca Istriana Hall **5th SYMPOSIUM ON INTERFACE PROVIDERS IN NEUROREHABILITATION**
Chairpersons: Raphael Bene (Zagreb, Croatia), Natko Beck (Zagreb, Croatia)
Raphael Bene (Zagreb, Croatia) & N. Beck (Zagreb, Croatia): Welcome to the 5th IPNR symposium
Natko Beck (Zagreb, Croatia): Applying Neuroscientific findings: a mobile, music-notch therapeutic tool for Tinnitus
Miroslav Vrankić (Rijeka, Croatia): Developing alternative communication interfaces for disabled community
Ines Delzotto (Pula, Croatia): Pula's centre for assistive technology: present and future
Raphael Bene (Zagreb, Croatia): Capturing brain patterns of elite athletes via mobile, wireless EEG sensors
Viktor Peršić (Opatija, Croatia): Projekt SportLab in Thalassotherapy Opatija
- 17:00-18:00**
Uluka Hall **Poster Session**
Chairpersons (neurology): Ivan Bielen (Zagreb, Croatia), Kurt Niederkorn (Graz, Austria)
Chairpersons (psychiatry): Karl Bechter (Günzburg, Germany), F. Benedetti (Milan, Italy)
- 18:15-19:45**
Bianca Istriana Hall **NEUROSCIENCE AND ART – Student Session**
Chairpersons: Filip Đerke (Zagreb, Croatia)
Filip Đerke (Zagreb, Croatia): Neuroaesthetics
Diana Culej (Zagreb, Croatia): Music & Movement & Brain
Luka Filipović-Grčić (Zagreb, Croatia): Fine Arts & Brain
Zrinka Rajković (Zagreb, Croatia): Art Therapy in Neuropsychiatry
Alen Juginović (Split, Croatia): Neuroaesthetics, dreams, and drug-induced nightmares: a literature review
Discussion
- 18:00-20:00**
Belica Hall **Workshop: Implication of afferent sensory input and multimodal integration for postural control as a basis for functional tasks - The Bobath Concept** (max. 24 participants)
Chairperson: Doris Kutscher Meurer (Neuenkirchen, Germany)
- 20:00-21:00**
Bianchera Hall **Kuratorium Meeting**

Saturday, June 18th

- 09:00-10:00**
Uluka Hall **Best posters awards presentations**
Chairpersons: Vida Demarin (Zagreb, Croatia), Francesco Benedetti (Milan, Italy)
- 10:00-12:00**
Belica Hall **Workshop: Motor Learning in Gait**
Chairperson: Gordana Pošćić (Rijeka, Croatia)
- 10:00-12:00**
Uluka Hall **Joint Meeting with Alps-Adria Neuroscience Section and Central and Eastern European Stroke Society and WFN Applied Research Group on the Organization and Delivery of Care**
Chairpersons: Leontino Battistin (Padova, Italy), Vida Demarin (Zagreb, Croatia).
Alexey Danilov (Moscow, Russian Federation): SMART & HAPPY: health management system
Vida Demarin (Zagreb, Croatia): : Lifestyle modification in preserving brain health
Hrvoje Budinčević (Zagreb, Croatia): Cognitive decline in patients with atrial fibrillation
Vanja Bašić Kes (Zagreb, Croatia): Could we prevent cognitive decline in MS ?
Azra Alajbegović (Sarajevo, Bosnia and Herzegovina): Preventive Treatment for Primary Headaches
Bojana Žvan (Ljubljana, Slovenia): Slovenian network Telstroke (TeleKap) - our experiences after a year and half of functioning

ACADEMIC LECTURES

Mark Solms (Cape Town, South Africa): THE DREAMING BRAIN

Dr Solms will review findings regarding the brain mechanisms of dreaming from the 1950s, 1970s, 1990s and current (ongoing) research. He will discuss the implications of these findings for the Freudian theory of dreams. He will use the example of dream theory to illustrate the relevance of neuroscientific research for contemporary psychoanalysis.

Asim Kurjak (Zagreb, Croatia): FETAL NEUROBEHAVIOR ASSESSED BY KANET TEST

Direct assessment of functional development of the fetal central nervous system is not possible, but the assessment of fetal behavior may provide the possibility to distinct between normal and abnormal brain development. Since the ultrasonographic technique allowed the investigation of spontaneous fetal motor activity in utero first studies of spontaneous prenatal movements and fetal behavior were performed and published. 2D ultrasound was considered somewhat subjective method because information needs observer interpretation. The latest development of three-dimensional (3D) and four dimensional (4D) sonography that overcame some of the limitations of 2D methods enable precise study of fetal and even embryonic activity and behavior. Our findings on the behavior in the high-risk pregnancies for cerebral palsy assessed by our new neurological test. New scoring system for fetal neurobehavior assessed by three- and four-dimensional sonography will be presented.

MAIN THEMES LECTURES

NEUROPSYCHOANALYSIS

Mark Solms (Cape Town, South Africa): THE CONSCIOUS ID

Two aspects of the body are represented in the brain, and they are represented differently. The most important difference is that the brain regions for the two aspects of the body are associated with different aspects of consciousness. Very broadly speaking, the brainstem mechanisms derived from the autonomic body are associated with affective consciousness, and the cortical mechanisms derived from the sensorimotor body are associated with cognitive consciousness. Moreover, the upper brainstem is intrinsically conscious whereas the cortex is not; it derives its consciousness from the brainstem. These facts have substantial implications for psychoanalytic metapsychology because the upper brainstem (and associated limbic structures) performs the functions that Freud attributed to the id, while the cortex (and associated forebrain structures) performs the functions he attributed to the ego. This means that the id is the fount of consciousness and the ego is unconscious in itself. The basis for these conclusions, and some of their implications, are discussed here in a preliminary fashion;

Francesco Benedetti (Milan, Italy): NEUROIMAGING OF DREAMS AND FANTASIES: A FIRST STEP TOWARD INVESTIGATING INCOMPREHENSIBLE FIRST-PERSON EXPERIENCES

Introduction/Objectives. The investigation of cognitive processes across the sleep/wake cycle suggested that the dream experience is a narrative of complex events and that a story-like organization could be a feature of dream production itself and not merely due to reconstructive effects in recall. Acceptance of unplausibility in normal dreaming has been proposed to play key roles in normal mentation. The story-like organization of dream experience shows a pervasive bizarreness of events and actions which looks like psychotic thought, and largely exceeds that observed in normal waking fantasies. Little is known about the neural correlates of the confabulatory narrative construction of dreams.

Methods. We recorded dreams, fantasies elicited by ambiguous pictorial stimuli, and non-imaginative first- and third-person narratives from 12 participants, who were then studied for brain blood oxygen level dependent functional magnetic resonance imaging (BOLD fMRI) on a 3.0 Tesla scanner while listening to their own narrative reports and attempting a retrieval of the corresponding experience.

Results. In respect to non-bizarre reports of daytime activities, the script-driven recall of dreams and fantasies differentially activated a right hemisphere network including areas in inferior frontal gyrus (IFG) and superior and middle temporal gyrus (STG, MTG). Neural responses were significantly greater for fantasies than for dreams in all regions, and inversely proportional to the degree of bizarreness observed in narrative reports.

Conclusions These areas have been implicated in the semantic activation, integration, and selection needed to build a coherent story representation and to resolve semantic ambiguities; in deductive and inferential reasoning; and in self- and other-perspective taking, theory of mind, moral and autobiographical reasoning. Their degree of activation could parallel the level of logical robustness or inconsistency experienced when integrating informations and mental representation in the process of building fantasy and dream narratives. In the large majority of dream reports, the dreamer uses the first person pronoun "I" to describe the central actor. The first-person experiences that he describes are often incomprehensible. Here we showed that, when facing these narrative reports, the brain deactivates the areas dedicated to understand them.

Stanislav Matačić (Zagreb, Croatia): PSYCHOANALYSIS TODAY

Psychoanalysis is the first modern psychotherapy discovered by Sigmund Freud at the end of 19th Century. Since the death of its founder Freud in 1939, psychoanalysis has fruitfully developed toward various schools and directions, but inside the IPA (international association founded by Freud in 1910, and consisting today of more than 12.000 licensed analysts worldwide) still retains its basic principles. It is my wish to give in this presentation an brief overview of the present state of our therapeutic and scientific discipline.

During the latest decades of 20th Century following the DSM-III and Karl Popper's claim that it is a *pseudoscience*, psychoanalysis has lost its previous influence in psychiatry and Medicine in general having been connected more with the Humanities. It is my strong belief that it is essentially medical, that it has strong therapeutic possibilities and I should like to discuss it.

With the development of neuroscience and its new discipline *neuropsychanalysis*, a hundred years after Freud's, than unpublished, paper *Project for the scientific psychology (1895)* psychoanalysis in the 21th Century has a new direction for its development.

Although the Freudian thought was present in Croatia during the whole 20th Century, it is only after the fall of the Berlin Wall that we finally have a possibility to establish an IPA Society here, and the brief history of our path will be concluding to my presentation.

NEUROINFLAMMATION & NEURODEGENERATION

Karl Bechter (Günzburg, Germany): THE MILD ENCEPHALITIS HYPOTHESIS FOR PSYCHIATRIC DISORDERS

The causality of severe mental illness, mainly represented by the affective and schizophrenic spectrum disorders, is widely unknown. Established risk factors include genes and prenatal or perinatal hits, and with recent epidemiologic studies not least any severe infections and autoimmune disorders during life time. The latter factors even are related in time, meaning with closer time to the respective hit the risk is stronger. Another emerging line of findings in patients is an previously unknown role of the immune system, evidenced in blood, cerebrospinal fluid and, both by in vivo brain imaging and biopsy, though the latter in single investigations only. The mild encephalitis hypothesis (Bechter 2001, 2013) proposed an unitary model of mild neuroinflammation, difficult to diagnose as compared to classical encephalitis, to causally underlie a considerable subgroup of these disorders, the individual or specific symptomatology being related to additional potentially independent pathogenetic factors.

Accordingly we found in both, in therapy resistant affective and schizophrenic spectrum disorders, in about 40% of cases some CSF abnormalities, in addition in 30% increased neopterin and overall in 100% some cytokine abnormalities, mainly IL-8 increases. These findings match with the mild encephalitis hypothesis, although interpretation is discussed. Alternative views were the interpretation as encephalopathy with systemic inflammation and others. The respective issues and findings are outlined.

Francesco Benedetti (Milan, Italy): THE ROLE OF INFLAMMATION IN BIPOLAR DISORDER

Background. Bipolar disorder (BD) is associated with elevated biomarkers of cell-mediated immune activation and inflammation, in the absence of apparent somatic diseases, and with signs of widespread disruption of white matter (WM) integrity in adult life. Pivotal studies associated the activation of the inflammatory response system with vulnerability for mood disorders, diagnosis of BD, and core clinical features including depressive cognition, course of illness, and response to treatment. Consistent findings in animal models link WM damage in inflammatory diseases of the brain and serum levels of cytokines.

Methods. We tested the effects of pro- and anti-inflammatory cytokines and neurotrophic/hematopoietic factors, on DTI measures of WM microstructure in patients with a major depressive episode in course of BD. We used whole brain tract-based spatial statistics in the WM skeleton with threshold-free cluster enhancement of DTI measures of WM microstructure: axial (AD), radial (RD), and mean diffusivity (MD), and fractional anisotropy (FA).

Results. The pro-inflammatory cytokines TNF- α , IL-8, and IFN- γ shared the same significant associations with reduced FA, and increased MD and RD, with no effects on AD, in large overlapping networks of WM fibers mostly located in the anterior part of the brain and including corpus callosum, cingulum, superior and inferior longitudinal fasciculi, inferior fronto-occipital fasciculi, uncinate, forceps, corona radiata, thalamic radiation, internal capsule.

Conclusions. An increase of RD is thought to signify increased space between fibers, suggesting demyelination or dysmyelination. The pattern of increased RD and MD with reduced FA suggests that cytokine levels inversely associate with integrity of myelin sheaths. The activated inflammatory response system might contribute to BD pathophysiology by hampering structural connectivity in critical cortico-limbic networks. Peripheral cytokines can enter the brain by volume diffusion, or via active cytokine transporters at the blood–brain barrier. Microglia participates in neurogenesis, axon remodeling, synaptogenesis, synaptic pruning, synaptic remodeling, and developmental cell death, and its inflammatory activation disrupts these processes by lack of provision of neuronal growth factors or by producing neurotoxic factors and cytokines. Cytokines can influence the cell fate of oligodendrocytes, and even moderate systemic inflammation alters WM development, also including production of serum cytokines which in the periphery induce, in a bystander fashion, activation of monocytes and T cells: here we confirm that the detrimental effects of the pro-inflammatory state might involve WM microstructure in BD, in Key tracts contributing to the functional integrity of the brain.

Norbert Müller (München, Germany): THERAPEUTIC IMPLICATIONS OF INFLAMMATION IN PSYCHIATRIC DISORDERS.

A persistent (chronic) infection as aetiological factor and inflammatory process in psychiatric disorders is discussed since many years. A prenatal immune challenge during the second trimester of pregnancy seems to be crucial in schizophrenia, research points out that not one single pathogen but the immune response of the mother is related to the increased risk. Several reports described increased serum IL-6 levels in schizophrenia. IL-6 is a product of activated monocytes and of the activation of the type-2 immune response. Moreover, several markers of the type-1 immune response are decreased in the majority of schizophrenic patients, while signs of activation of the type-2 immune response are described accordingly in schizophrenia. Mechanisms involved in the inflammatory process in schizophrenia will be outlined focussing on the role of microglia cells, the macrophages of the brain. Microglia activation in schizophrenia was shown by studies using positron emission tomography (PET).

COX-2 inhibition reduces not only the levels of proinflammatory cytokines, COX-2 inhibition has also an impact to the glutamatergic neurotransmission and influences the tryptophan/kynurenine metabolism: all three components seem to be involved in the pathophysiology of schizophrenia. In the meantime, several studies with the COX-2 inhibitor celecoxib have been performed in schizophrenia. Short term studies of the COX-2 inhibitor celecoxib show a therapeutic effect mainly in early stages of schizophrenia, the pertaining studies will be discussed. However, other immune-based therapeutic approaches including the use of antibiotics and antiviral agents have been studied and will be outlined.

Proinflammatory cytokines, such as IL-6, IL-1 and TNF- α appear to be elevated in the peripheral blood of depressed patients. Thus IDO activity may be enhanced in depressed patients through these cytokines. Although IL-6 does not directly act on IDO, its elevated levels in serum may contribute to IDO activation within the CNS by the stimulatory effect on PGE₂, which acts as cofactor in the activation of IDO. This fits with a report on the correlation of increased in vitro IL-6 production with decreased tryptophan levels in depressed patients. Further inflammatory markers showing evidence for a possible role in depression, such as C reactive protein (CRP) or quinolinic acid, a neurotoxic molecule of the tryptophan/kynurenine metabolism are highlighted including the discussion of biomarkers as markers of therapy response.

We were able to demonstrate a statistically significant therapeutic effect of the COX-2 inhibitor on depressive symptoms in a study using the selective COX-2 inhibitor celecoxib in major depression (MD). Another study in fifty depressed patients suffering from MD also showed a statistically significant better outcome of the COX-2 inhibitor celecoxib. Further therapeutic strategies based on immune-modulatory effects will be discussed as well.

Franz Fazekas (Graz, Austria): REVISITING THE DIAGNOSIS OF CIS AND THE IMPLICATIONS FOR THERAPY.

A clinically isolated syndrome (CIS) is a first episode of neurological dysfunction with features of inflammatory demyelination which is suggestive of multiple sclerosis (MS). The diagnosis of MS requires evidence of CNS white matter lesions disseminated in space and time. To what extent a patient presenting with a CIS can already be diagnosed as suffering from MS thus largely depends on the sensitivity of the diagnostic tools and diagnostic criteria applied. Since the introduction of the McDonald criteria in 2001 which still cautiously relied on magnetic resonance imaging (MRI) findings the requirement for fulfilling lesion dissemination in time and space on MRI have been constantly simplified and relaxed. Using the McDonald 2010 criteria a diagnosis of MS can thus be made already in up to a third of CIS patients with a single contrast-enhanced MRI scan. This is important to note as therapeutic studies in CIS were designed and conducted mostly without excluding patients who nowadays would already be labelled as suffering from MS. Therefore we may assume the so called Will Rogers phenomenon to occur, i.e. our patients which are still labelled as CIS following current diagnostic criteria are likely to have a better prognosis than those included in existing CIS treatment trials even without any long term treatment. This aspect should be considered when counselling patients presenting with a CIS but must not delay early disease modifying intervention where needed.

Valeria Caso (Perugia, Italy): NEUROINFLAMMATION IN INTRACEREBRAL HAEMORRHAGE

Intracerebral hemorrhage (ICH) is associated with the highest mortality and morbidity despite only constituting approximately 10–15% of all strokes. Complex underlying mechanisms consisting of cytotoxic, excitotoxic, and inflammatory effects of intraparenchymal blood are responsible for its highly damaging effects. Oxidative stress (OS) also plays an important role in brain injury after ICH but attracts less attention than other factors. Increasing evidence has demonstrated that the metabolite axis of hemoglobin-heme-iron is the key contributor to oxidative brain damage after ICH, although other factors, such as neuroinflammation and prooxidases, are involved. Neuroinflammation evoked by intracerebral blood involves the activation of resident microglia, the infiltration of systemic immune cells and the production of cytokines, chemokines, extracellular proteases and reactive oxygen species. Previous studies focused on innate immunity including microglia, monocytes and granulocytes. More recently, the role of adaptive immune cells has received increasing attention.

Little is currently known about the interactions among different immune cell populations in the setting of ICH. Nevertheless, immunomodulatory strategies are already being explored in ICH. To improve the chances of translation from preclinical models to patients, a better characterization of the neuroinflammation in patients needs to be carried out in the future.

Nenad Bogdanović (Oslo, Norway): NEW INSIGHTS IN NEUROINFLAMMATION AND ALZHEIMER'S DISEASE

Evidence exists that neuroinflammation might drive the pathogenic process in Alzheimer's disease (AD). Microglia and astroglia, via pattern-recognition receptors bind to soluble amyloid β ($A\beta$) oligomers, misfolded and aggregated proteins and trigger an innate immune response by release of inflammatory mediators. Not only internal but external factors, including systemic inflammation are likely to interfere with immunological processes of the brain and further promote disease progression. It is interesting that genes for immune receptors TREM2 and CD33 are associated with AD. $A\beta$ deposition alone might be sufficient to induce an inflammatory reaction that subsequently contributes to cognitive decline and development of AD. Mild cognitive impairment (MCI), a clinical manifestation before dementia, is characterized by involvement of inflammation in disease pathogenesis. Several microglial cell-surface and mitochondrial receptors were used for development of in-vivo imaging ligands such as the translocator protein TSPO, which is increasingly expressed under conditions of neuroinflammation. It is likely that the TSPO ligand ^{11}C -PK11195 parallels amyloid deposition and signals in patients with AD are likewise associated with cognitive impairment suggesting that cortical microglia activation is detrimental to cognitive function. Despite that more and more evidences suggest that inflammation has a causal role in AD pathogenesis, detection of inflammatory markers has not yet been established as a valuable method for diagnosis or monitoring of AD. Several studies highlight increased concentrations of cytokines in the CSF as risk factors for conversion of MCI to the dementia stage of AD or as markers of the speed of cognitive decline and disease progression. Moreover systemic immune cells and secreted signaling proteins communicate with the brain, and have been associated not only with neuroinflammation and neurodegeneration in general. Non-steroidal anti-inflammatory drug (NSAID) epidemiology and clinical trial results have produced some doubts but highlighted that physiological cytokine regulation of glia activation and microglial phenotypes is highly context-dependent (APOE genotype and AD genes) and stage-dependent (no benefits seen in late intervention). Early trials with indomethacin and large-scale trials with other NSAIDs seemed to be unsuccessful and unreproducible. Other anti-inflammatory drugs, including prednisone, hydroxychloroquine, simvastatin, atorvastatin, aspirin, and rosiglitazone, equally showed no clinically significant changes in primary cognitive outcomes in patients with prodromal symptoms or AD dementia. Although a large randomized study of the NSAIDs naproxen and celecoxib initially reported a detrimental effect for both a longer-term follow-up of these patients suggested that timing and choice of specific NSAID might be a key. It has been proposed that naproxen can be protective in patients who had been asymptomatic at baseline. To understand the immune system pathways and to improve the diagnostic and therapy of AD future studies should a) answer what is the individual contributions of microglia and other cell types to the neuroinflammatory response during the course of AD, b) improve ligands to target microglial activation for PET or other imaging, c) recognize the effect of systemic comorbidities and aging on AD. Modulation of risk factors and targeting of these immune mechanisms could lead to future therapeutic or preventive strategies for AD.

Zdravko Lacković Z, Ivica Matak, Boris Filipović (Zagreb, Croatia): UNEXPECTED NEUROGENIC INFLAMMATION OF MENINGES AS REACTION TO PAIN IN TRIGEMINAL REGIONS

Introduction/Objectives: While botulinum toxin type A (BoNT/A) is an approved therapeutic for chronic migraine, its mechanism of action is unknown. Dural neurogenic inflammation (DNI) induced by trigeminal nerve activation via different stimuli is commonly used to investigate migraine pathophysiology and pharmacotherapy. In the past several years we investigated reactivity of cranial dura to trigeminal pain, and the mechanism of BoNT/A action on it.

Participants, Materials/Methods: We employed a rat model of (1) formalin induced pain, (2) temporomandibular joint (TMJ) inflammation induced by complete Freund's adjuvant (CFA) and (3) infraorbital nerve constriction injury. The rats were treated with BoNT/A injections or sumatriptan per os. Dural neurogenic inflammation was investigated by Evans blue-plasma protein extravasation and cell histology. BoNT/A enzymatic activity in dura was assessed by cleaved synaptosomal-associated protein 25 (SNAP-25) immunohistochemistry.

Results: BoNT/A and sumatriptan reduced nociceptive behavior including supersensitivity to pain and allodynia, and dural neurogenic inflammation in all 3 models of pain in trigeminal regions. BoNT/A prevented the inflammatory cell infiltration, and counteracted the increase of CGRP levels in dura. After toxin peripheral application BoNT/A-cleaved SNAP-25 was colocalized with CGRP in intracranial dural nerve endings. Injection of axonal transport blocker colchicine into trigeminal ganglion prevented the occurrence of cleaved SNAP-25 in dura.

Conclusions: It is generally assumed that migraine is associated with neurogenic inflammation of meninges. In our research we revealed that not only migraine but different types of peripheral pain in trigeminal region are accompanied by neurogenic inflammation of the meninges.

This work was supported by Croatian Science Foundation (IP-2014-09-4503).

NEUROREPAIR**Srećko Gajović (Zagreb, Croatia): IN VIVO MOLECULAR IMAGING IN THE EVALUATION OF ISCHAEMIC BRAIN LESION IN THE MOUSE**

The preclinical selection of the new therapeutic candidates for stroke rely on the representative animal models. As a model for the ischemic stroke we are using medial cerebral artery occlusion, which results in the ischemic lesion of the mouse brain. To monitor the molecular events after ischemic lesion, in the living mouse brain, in vivo small animal imaging modalities were applied. They include magnetic resonance imaging (MRI) for small animals, and light based imaging modality - bioluminescence imaging (BLI).

To visualise the molecular events related to the activity of TLR2, GAP43, and CASP3 in the brain of the living mouse was applied. Imaging was performed by IVIS Spectrum Pre-clinical In Vivo Imaging System (Perkin Elmer, US) in living animals genetically modified to carry luciferase reporter by recording the emitted light from the brain. The ischemic lesion is monitored by T2 MRI modality by Bruker BioSpec 70/20 USR with 7T magnetic field. TLR2, GAP43, and CASP3 were upregulated after stroke. To analyze the apoptosis in subset of GAP43 cells the imaging with DEVD-aminoluciferin was performed. The findings suggested that CASP3 activity, not necessarily associated with neuronal apoptosis, increased, and CASP3 and GAP43 might be part of a common molecular pathway involved in early stress response after stroke. This added neuronal stress in addition to inflammation, repair, and apoptosis as important process to be assessed by the bioluminescent imaging as the brain response to stroke.

The same strategy of in vivo insight in brain molecular events was applied as well to monitor the biocompatibility of brain applications of the stem cells and biomaterials. This opens the way to design and preclinical testing of innovative therapies for brain diseases.

Acknowledgments: The study was supported by EU FP7 grant GlowBrain (REGPOT-2012-CT2012-316120).

Vida Demarin (Zagreb, Croatia): THE ROLE OF NEUROPLASTICITY IN NEUROREPAIR

Neurodegenerative diseases and stroke are foremost causes of medical, as well as socioeconomic problems in modern society leading to quality of life impairment of patients and caregivers.

Disorders like stroke, dementia, Alzheimer's and Parkinson's disease, Huntington disease, multiple sclerosis and acquired brain trauma contribute to the decline of cognitive, motor, and sensory abilities.

Neuroplasticity, also known as cortical remapping, challenges the idea that brain functions are fixed in certain time. It refers to changes in neural pathways and synapses which are due to continuous stimulation and practice enhanced by previous experience.

Mirror-neurons system is activated both in action and observation. Practicing mental stimulation improves memory and attention.

Neuroplasticity can act through two possible mechanisms on motor deficit and cognitive impairment, by forming new, or improving existing pathways. The changes in the cortex organization include an increase in the number and density of dendrites, synapses and neurotrophic factors. After damage has been afflicted to the motor cortex, changes of activation in other motor areas are observed. These changes occur in homologue areas of the non-affected hemisphere which can substitute for the lost functions or in the intact cortex adjacent to the damage. Thanks to these cortical reorganizations the patients can recover, at least in part, their lost abilities.

Brain health is maintained through control of conventional vascular risk factors, practice of physical activity, healthy nutrition, stress management and mental stimulation. Challenging the brain with different tasks creates new neural connections and intensive exercise leads to improvement in neuroplasticity.

**Robert N. Gan (Singapore): NEURORESTORATIVE STRATEGY FROM NATURAL SUBSTANCES:
NEUROAID**

For over 70 years, the belief that the brain is a “static” organ that has no capacity for regeneration was held as a dogma. We now know from scientific works during the past three decades that neurogenesis and neuroplasticity happen in the adult human brain. While they happen in normal conducive situations like learning, they also happen after brain injury such as stroke in an attempt to repair and restore function.

Enhancing such neurorestorative processes has become a very attractive strategy to improve recovery after stroke or brain injury. In particular, non-clinical data on the use of natural substances, such as NeuroAiD (MLC601, MLC901), has improved our understanding of the multi-modal strategy of amplifying neurogenesis, angiogenesis, axonal sprouting, and synaptogenesis. These beneficial properties have been demonstrated clinically through long-term follow up of patients in a stroke recovery trial, the CHIMES-E study.

Vladimira Vuletić (Zagreb, Croatia): DEEP BRAIN STIMULATION IN MOVEMENT DISORDERS -IS THERE ANY NEUROPROTECTION?

Parkinson's disease (PD) is a progressive and disabling movement disorder that affects millions worldwide and is characterized by tremor, bradykinesia, rigidity and balance difficulties. There are a lot of studies trying to find and test a lot of neuroprotective agents, but none of these agents has been successful at preventing the progression of PD.

Deep brain stimulation of the subthalamic nucleus (STN-DBS) is efficacious in treating the motor and non-motor symptoms of Parkinson's disease (PD). However, the impact of STN-DBS on the progression of PD is still unknown. Previous preclinical studies have demonstrated that STN-DBS can attenuate the degeneration of a relatively intact nigrostriatal system from dopamine (DA)-depleting neurotoxins. Clinical results, on the other hand, are conflicting. Investigating the neuroprotective effects of STN-DBS in a clinical population is difficult. This is in part due to the fact that STN DBS is currently practiced as a treatment in advanced stage. This lecture will provide some studies' results concerning neuroprotection and DBS. If DBS will be the first therapy proven to slow PD progression, it must be applied in the earliest stages of the disease to have such an effect.

LECTURES**9th International Epilepsy Symposium in Pula****Hrvoje Hećimović (Zagreb, Croatia): EMOTIONS AND DEPRESSION IN TEMPORAL LOBE EPILEPSY**

Epilepsy is a chronic disorder that adversely affects social, vocational, and psychological functioning. Despite the variety and complexity of the negative clinical associations with epilepsy, depression is remarkably prevalent in patients with epilepsy.

An estimated 30-55% of persons with refractory epilepsy have major depression, and depression has a stronger correlation than seizure frequency with quality of life. Available data indicate that epilepsy and depression may share a common neural network, and the clinical expression of disease results from underlying brain dysfunction rather than social and vocational disability. The brain regions commonly involved in various types of epilepsies, such as the hippocampus and amygdala in temporal lobe epilepsy and subcortical nuclei in idiopathic generalized epilepsies, are important components of current models of depression. Increased understanding of mechanisms of depression in epilepsy is not only crucial for improving care of many persons with seizures, but may also yield useful information about principal mechanisms underlying both depression and epileptogenicity. Recent neuroimaging studies associated depression with specific cerebral structural and functional disturbances, suggesting that a dysfunction in neural networks underlie mood changes.

Current evidence suggests that smaller hippocampal volume in humans is not only a hallmark of mesial temporal lobe epilepsy, but is also associated with depression, and functional imaging studies point to dysfunction in the fronto-limbic network in patients with major depressive disorder. This is also in concord with reports from animal, lesional, and human postmortem studies. Understanding neuroanatomy and interconnectivity of the structures, neurotransmitter pathways and molecular mechanisms implicated in this dysfunction creates a basis to understand clinical expression of the disease. The fronto-limbic pathway presents a model to study a network dysfunction associated with epileptogenicity and mood changes.

Marjan Zaletel (Ljubljana, Slovenia): PERSONS WITH EPILEPSY: BETWEEN SOCIAL INCLUSION AND MARGINALISATION

Epilepsy can change the social status of persons with epilepsy (PWE) and has an effect on their social inclusion as well as their perception of social inclusion. On the other hand socioeconomic status influences seizure control. Recent research has shown that stigma experienced by PWE contributes to increased levels of psychopathology, decrease in social contact and social capital, and lower quality of life. Past research has focused on individual aspects of epilepsy, namely on its influence on the quality of life of PWE in relation to stigmatisation, discrimination, employment opportunities, psychiatric epilepsy occurrence, style of living, burden of epilepsy, and pregnancy. The aim of our study is to explore subjective experience of PWE social inclusion in Slovenia. The objectives of this study were to determine how PWE experience epilepsy and the effect of PWE experience of social inclusion. The study takes a qualitative approach. We included only voluntary participants. Participants were recruited using *snowball sampling* technique. Eleven semi-structured interviews were conducted with eleven participants. Interviews were analysed using thematic analysis. The interviews took place between November 2011 and March 2012 at various locations in Slovenia. Interviews were transcribed word-for-word. After receiving authorisation, transcripts were analysed and interpreted using content analysis. Transcripts were coded. We merged similar codes in superior and subordinate categories, which we then used to form a coding frame. Participants described the physical draining effect of an epileptic episode. Some of them are able to recognize the beginning of an episode, while some of them are not. After an episode they feel tired, drained, they frequently suffer from headaches and are in need of rest. Fear was a common emotional consequence of epilepsy emphasised by the participants. They mentioned different forms of fear: fear related to reaction of their friends and family, and others, fear that the epilepsy is going to get worse. PWE have little control over epilepsy disclosure due to the unpredictable nature of epileptic episodes. Control over epilepsy disclosure can be very important, namely because of fear of rejection. Participants adapt to the epilepsy in different manners. A low feeling of self-worth was identified as one of the main factors in the participants' having trouble trusting others. We concluded that PWE experience of social inclusion depends on various psychosocial factors and differs from person to person. The consequences of epilepsy are shown in PWE social contacts and their sense of social inclusion and autonomy.

Josipa Stipetić Irha (Zagreb, Croatia): AVAILABILITY IN CHILDREN WITH CEREBRAL PALSY FOR APPROPRIATE HEALTH CARE

Cerebral palsy may significantly reduce quality of life. Thus, it is important to recognize it early and from the very start provide optimal medical care. Many factors are involved in rehabilitation of these patients. We assessed current attitudes among parents of children with cerebral palsy. We wanted to provide specific tasks for future guidelines in offering these children appropriate health care. Our primary hypothesis was that parents of children with cerebral palsy are satisfied with provided health care to their children in the frame of current Croatian laws.

70 parents of children with cerebral palsy were included. Mean age of children was 7.7 years (range 4-11 y) and 52% were boys. Majority of parents (40%) said their children were offered additional diagnostic procedures between 6-12 months of age. None of the parents were satisfied with diagnostic procedures offered, and only 11% were satisfied to limited extent. When asked about waiting list to see a neuropediatrician, majority of parents were partly or completely unsatisfied, and had similar attitude to long waiting lists to see a physio- or speech therapist. No parents were completely satisfied on any of these specific questions.

Our data are among the first in Croatia and show that a high percentage of parents of children with cerebral palsy were not satisfied. The unexpectedly high percentage of parents were not satisfied with accessibility to medico-legal regulations, long waiting lists, timing of the physiotherapy and hospitalization.

Our results suggest that parents of children with cerebral palsy need more help in many segments needed for normal socioeconomic welfare of their families. These data may contribute to a need for significant modulations in the system of health care for children with cerebral palsy.

Cerebral and spinal malformations – diagnosis and treatment

Thomas Gatttringer (Graz, Austria): NEUROLOGICAL ASPECTS

The aim of this lecture is to give an overview of the main subtypes of vascular malformations of the brain and spinal cord, and their heterogenous clinical presentations. Furthermore, this talk covers principles regarding the diagnosis of central nervous system vascular malformations with a special focus on noninvasive neuroimaging. Medical management based on recent results of the ARUBA (A Randomised trial of Unruptured Brain Arteriovenous malformations) trial and their implications for clinical practice will be discussed.

Günther Erich Klein (Graz, Austria): NEUROINTERVENTION

An arteriovenous malformation is defined as a congenital maldevelopment of blood vessels with preservation of a primitive direct communication between otherwise normal arterial and venous channels. AVMs are found throughout the central nervous system but are most common (70%) in the supratentorial structures. Brain AVMs most frequently involve the middle cerebral artery distribution followed by the anterior and posterior cerebral distributions. They may be located in the brain parenchyma (pial AVMs), involve the dura (dural AVMs), or have dural and pial components (mixed AVMs).

Patients with brain AVMs may be asymptomatic, with the lesion being discovered by CT or magnetic resonance imaging (MRI), or may present with intracranial hemorrhage, seizures, progressive neurological deficit, or headaches. In children, hemorrhage is seven times more frequent than seizures as the initial event. In the neonatal period, brain AVMs or fistulas can present as a high-output shunt and congestive heart failure.

The mortality rate from hemorrhage in AVMs is 10% from the initial bleeding episode, 13% from a second, and 20% from a third. The risk of recurrent hemorrhage after an initial one is 4% per year. The risk of intracranial hemorrhage in patients presenting with seizures is between 1.0% and 2.3% per year.

The natural history of brain AVMs is not well known. Some reports in the literature attribute to them a relatively benign clinical evolution, whereas others report a 10% to 17% mortality rate from hemorrhage and 40% to 50% rate of incapacitating morbidity.

The most important radiological tools for the diagnosis of brain AVMs are cerebral angiography, CT, and MRI. Cerebral angiography is still the examination of choice for assessment of arterial feeders and the size and location of the nidus and the venous outlet. Bilateral external and internal carotid as well vertebral angiography are mandatory. This thorough angiographic evaluation also demonstrates the external carotid-artery contribution to the AVM nidus or the surrounding normal brain and shows potential pial collaterals that may be important in the planning of therapy and assessment of the risks.

A Ct scan of the brain is a common screening technique for vascular malformations. It helps to localize the nidus of the AVM; it shows areas of hemorrhage, edema, or calcifications; and it evaluates the response of the surrounding parenchyma and the ventricular system.

MRI is an important tool for the investigation of intracranial and spinal vascular lesions. MRI also can show changes in the flow pattern within the AVM nidus and the draining veins after partial endovascular occlusion or surgical resection of the nidus. The nidus can be better seen on MRI than on CT, and the presence of isobutyl-2-cyanoacrylate (IBCA) with tantalum powder does not produce artefacts in MRI images.

Embolization has a significant role in the multimodality treatment of brain AVMs, by either enabling or facilitating subsequent microsurgical or radiosurgical treatment.

Advances in superselective microcatherization techniques, which took place in the past decade, established superselective endovascular exploration as an integral and indispensable tool in the pretherapeutic evaluation of brain and spinal AVMs, including vascular composition of the nidus, types of feeding arteries and types and patterns of venous drainage. In addition, various types of weak angioarchitectural elements, such as flow-related aneurysms and varix formation proximal to high-grade stenosis of draining veins, can be identified as factors predisposing for AVM rupture.

Valavanis showed in his study, that 40% of patients with brain AVMs can be cured by embolization alone with a severe morbidity of 1.3% and a mortality of 1.3%

The technical goal of embolization is the stable obliteration of the nidus of the AVM with preservation of the normal arterial supply to the adjacent and remote brain parenchyma and without compromise of the venous drainage of the brain.

Spinal cord (SC) AVMs are rare lesions of congenital origin representing only about onetenth of cerebral AVMs. They are represented by intradural AVMs, intradural AVFs, and dural fistulae (DAVFs) with perimedullary venous drainage, the last being the most frequent.

5TH EUROPEAN PSYCHOPATHOLOGY SUMMER SCHOOL – PART 1.

Margherita Bechi (Milan, Italy): SOCIAL COGNITIVE AND NEUROCOGNITIVE INTERVENTIONS IN SCHIZOPHRENIA: RAISING THE BAR OF FUNCTIONING

Social and neurocognitive functions are severely impaired in patients with schizophrenia and directly influence daily functioning, compromising work competence, social interactions and independent living abilities. Neurocognition refers to information acquisition and processing, while social cognition represents the interface between emotional and cognitive processing. Interestingly, social cognition appears to mediate the interaction between neurocognition and daily functioning, thus predicting functional outcome in interplay with neurocognition.

Given their role on daily functioning, the treatment of both social and neurocognitive deficits has been a focus of research in the past decade. Currently, a consensus has been reached on the effectiveness of cognitive remediation programs to improve neurocognition, as well as of several social cognitive interventions to enhance targeted domains. However, the impact of such trainings on functional outcome needs to be further investigated and significant predictors are still unclear.

Recently, several combined rehabilitation programs, integrating both cognitive remediation and social cognitive interventions, have been developed with the hypothesis that a synergic approach may optimize outcomes. Data from these studies supported the hypothesis, showing a greater impact of combined treatments on daily functioning, although there is still a high heterogeneity.

Results of recently developed social cognitive trainings and their interaction with cognitive remediation programs will be discussed, highlighting the role of possible predictors of improvement. Moreover, the impact of combined interventions on daily functioning will also be addressed, with a special focus on work competence.

Martin Brüne, Vanessa Raaff, Giancarlo Dimaggio G, Anna Bucheim, Marc-Andreas Edel (Bochum, Germany): IS MENTALIZATION-BASED THERAPY A USEFUL ADJUNCT TREATMENT TO DIALECTICAL BEHAVIOR THERAPY IN BORDERLINE PERSONALITY DISORDER?

Borderline Personality Disorder (BPD) is a serious psychiatric condition that is characterised, among other features, by emotional instability, impulsivity, and interpersonal dysfunction. Dialectical Behavior Therapy (DBT) is one of at least four psychotherapeutic treatment approaches, which has proven effective in BPD. While DBT mainly addresses self-harm and emotion regulation, interpersonal difficulties may better be dealt with by more insight-oriented approaches such as Mentalization-based Treatment (MBT).

This presentations deals with a randomized controlled trial into the efficacy of MBT adjunct to DBT, compared to DBT alone, for patients with BPD.

Both treatments were highly effective in reducing symptom severity. The combination of DBT and MBT was, however, superior to DBT alone in reducing self-harm and attachment anxiety, and in improving affective mentalizing.

In summary, MBT, adjunct to DBT, may improve interpersonal skills and attachment security, as compared to DBT alone, though the short treatment duration warrants caution in interpreting the findings.

Anna Buchheim (Innsbruck, Austria): NEURAL CHANGES IN DEPRESSED PATIENTS DURING PSYCHODYNAMIC PSYCHOTHERAPY: AN fMRI AND EEG STUDY USING AN ATTACHMENT PARADIGM

Introduction/Objectives: In the last decade psychotherapy research has expanded its interest in neurobiological approaches using e.g. PET, fMRI, EEG. Clinical neurosciences approaches have characterized specific neural circuits or brain regions associated with psychiatric disorders; fMRI studies on depression have mostly examined the effect of short-term, interpersonal or cognitive-behavioral psychotherapy. The effect of long-term, psychoanalytic treatment has not been assessed using fMRI and EEG so far. In this presentation we will focus on our EEG-data.

Participants, Materials/Methods: In this study we investigated recurrently depressed (DSM-IV) unmedicated outpatients (N=16) and control participants matched for sex, age, and education (N=17) before and after 15 months of psychoanalytic psychotherapy using fMRI and EEG. Participants were assessed with the Adult Attachment Projective Picture System (AAP) to evaluate attachment representations. Moreover participants were assessed at two time points (at the beginning of treatment and after 15 months), presenting AAP pictures combined with personalized core sentences previously extracted from the AAP-interviews, contrasted with non-personalized, neutral descriptions of the AAP pictures. Electroencephalographic (EEG) activity was recorded at 32 electrode sites of the extended 10–20 system, (impedance 5 kV). Off-line analysis was performed using Brain Vision Analyzer software. We extracted several frequency ranges (alpha, beta, gamma) using a Morlet wavelet transformation. Late positive potentials were computed for the time window 500 – 1000 ms.

Results: Patients showed a higher percentage of disorganized attachment representations at the beginning of treatment compared to controls. These disorganized patterns changed to organized patterns after 15 months. In the fMRI study patients showed a higher activation in the left anterior hippocampus/amygdala, subgenual cingulate, and medial prefrontal cortex before treatment and a reduction in these areas after 15 months. This reduction was associated with improvement in depressiveness specifically, and in the medial prefrontal cortex with symptom improvement more generally (Buchheim et al. 2012, PLoS ONE, 7: e33745). The EEG data are about to be analyzed and will be presented in more detail. Preliminary data showed that patients showed higher levels of gamma activity and late positive potentials than control participants in fronto-central electrode sites when confronted with personalized attachment material compared to neutral sentences. Decrease of this activity was significantly higher in patients compared to healthy controls especially in the personalized condition.

Conclusions: These data suggest that LPP and gamma-band activity could be relevant indicators for the processing of personal affective material related to attachment during the course of psychodynamic treatment.

Johannes Schröder (Heidelberg, Germany): NEUROLOGICAL SOFT SIGNS IN VARIOUS PSYCHIATRIC DISORDERS

Neurological soft signs (NSS) or subtle motor and sensory neurological abnormalities are frequently found in major psychiatric disorders. While the majority of studies have so far focussed on patients with schizophrenia, recent studies also investigated

NSS in affective disorders, mild cognitive impairment and in dementias. According to these findings NSS (i) primarily involve motor functioning, (ii) correspond to psychopathological symptoms and cognitive deficits, and thus (iii) vary in the clinical course of the respective disorders. NSS are among the best replicated findings in biological psychiatry; from a clinical standpoint these findings also underline the importance of a thorough clinical examination.

Darko Marčinko (Zagreb, Croatia): PSYCHOTHERAPY OF PERSONALITY DISORDERS: A CONTEMPORARY APPROACH

The major schools of psychotherapy for patients suffering from personality disorders emphasize a range of therapeutic techniques that are unique to their intervention. Recent trends in the mental health care emphasize the use of modified psychodynamic psychotherapy for the treatment of patients with personality disorders. The author highlights empirical research that supports both the usefulness and the costeffectiveness of this treatment approach. He also reviews some effective clinical strategies for treatment of borderline personality patients mentioned in the books of his team („Personality disorders: real people, real problems“; „Narcissistic personality disorder“).

5TH EUROPEAN PSYCHOPATHOLOGY SUMMER SCHOOL - SPECIFICS OF FORENSIC PSYCHIATRIC TREATMENT WITHIN – WHAT HAS TO BE CONSIDERED ? - PART 2

Nadica Buzina N, Goran Arbanas, Vlado Jukić (Zagreb, Croatia): FORENSIC PSYCHIATRIC ASPECTS OF THE TREATMENT OF PERSONS FOUND NOT-GUILTY-BY-REASON-OF-INSANITY IN THE REPUBLIC OF CROATIA

Introduction/Objectives: Treatment of the persons found not guilty by reason of insanity for their criminal acts is regulated by the Act on the protection of persons with mental disorders. The first version of this Act was passed at the end of 1997, and entered into force on the 1st of January 1998. The Act has been changed several times, and these changes were mainly regarding outpatient treatment. After criminal procedure is finished, and if the offender is assessed as not guilty by reason of insanity, no penal law sanctions will be applied, but (s)he will be referred to an involuntary treatment in one of the four forensic psychiatric institutions in Croatia (Popovača, Vrapče, Ugljan and Rab, with the total capacity of 380 beds). The treatment can be, according to the current Act, outpatient or inpatient.

The authors emphasize key consequences of the before mentioned legal regulations on the forensic psychiatric position of persons found not guilty by reason of insanity, focus on difficulties in enforcement of the Act and present some of their own research results. One contradiction in the Act itself is that person found not guilty by reason of insanity cannot be punished (due to insanity), but on the other side, the maximal duration of treatment is defined by the maximal penal sanction (duration of prison sentence), no matter of the psychopathological state of the person.

5TH PSYCHOPATHOLOGY SUMMER SCHOOL – SPORTS PSYCHIATRY (PART 3)

Tobias Freyer (Freiburg, Germany): SPORTS THERAPY FOR MENTAL DISORDERS (DEPRESSION, ANXIETY, EATING DISORDER, DEMENTIA, ADDICTION)

This lecture will summarize the current evidence of exercise therapy for mental disorders. It will give an overview of mechanisms of action and focus on practical implications for the implementation of a feasible and effective exercise program in mental health settings.

Karl Jürgen Bär (Jena, Germany): SPORT SPECIFIC MENTAL DISORDERS

&

Valentin Zdravko Markser (Köln, Germany): SPORT PSYCHIATRY IN HIGH PERFORMANCE SPORTS

Despite the great public interest in athletic achievements, the mental disorders in high performance sport are very poorly investigated. Available research data on the prevalence of mental disorders in this area suggest that mental disorders are as common in professional sports as in the general population. However, there are sport specific variations and specific disorders are more common in certain types of sports than in others.

For the treatment of psychiatric disorders, sport has been used as a nonspecific additional method for decades. According to the lack of evidence, there was a paucity of specific suggestion for the application in mental disorders. In our days, various studies suggest that sport or physical activity has sufficient therapeutic value and needs more frequent application as a treatment option.

Thus, sport psychiatry deals with the therapeutic potential of sport for mental illnesses. Moreover, it can also be defined as a discipline to prevent, diagnose and treat the psychiatrically related medical issues confronting the high-performance athlete.

Psychodynamic aspects can help to close the gap of descriptive psychopathology. It could be a way to understand many phenomena in high performance sports and help professionals in this area to detect early symptoms of sport specific strains and mental disorders.

EMOTIONS AND MOTORICAL LEARNING**Osman Sinanović (Tuzla, Bosnia and Herzegovina): EMOTIONS AND MOTORICAL LEARNING – NEUROLOGICAL VIEW**

Learning is a special form of memorizing and it consists of active, voluntary, and repetitive memorizing, its goal being permanent retention of the information which is being learned (or at least until the exam is over). The essence of learning is in repetition, in other words, in multiple perception of the same information („Repetitio est mater studiorum – Repetition is the mother of learning“). During repetition the chemical process of synthesis of nucleic acids (RNA) and proteins is also being repeated, thus the engrams are being „imprinted“ over and over. We can talk about productive and unproductive learning. Productive learning or efficient learning refers to a series of conditions, which are motivation, level of intelligence, temporal organization of learning, conscious determination of the aim of learning, compatibility of the methods of learning with the psychophysiological disposition for learning, retroactive inhibition, revising, muscle tone.

According to complexity we differentiate: simple learning (conditioning, associations, mechanical learning); complex learning (learning motor activities, comprehensive learning with insight, learning using the trial and error method). According to the material: motoric and verbal learning, according to modality: kinesthetic, auditory and visual.

Motoric learning refers to the process of forming of a motoric skill which we can roughly define as performing, which can, once learned, be realized fairly accurately, paying little or no attention to parts of the whole. Defining „skill“ is not easy or simple, and different definitions or lists of characteristics can be found in literature.

Sensory-motoric learning refers to the process of forming of a motoric skill which we can roughly define as the ability to harmoniously perform a series of movements. This is a pretty enigmatic way of learning not yet fully researched. Sensory-motoric and verbal learning often combine, especially in complex learning methods.

Process of motoric learning as well as learning in general includes different brain structures and neurotransmitters. Neuroplasticity is a modern paradigm of motor learning process and reorganization of lost function. It is important to know about it in the process of planning of adequate motoric rehabilitation and rehabilitation of non-motor disturbances after stroke, in case of other brain disorders and damages of brain structures.

Doris Kutscher Meurer (Neuenkirchen, Germany): THE RELEVANCE OF SENSORY AFFERENT INPUT TO REGAIN THE BODY SCHEMA AS A BASIS FOR PHYSIOTHERAPY IN NEURO REHABILITATION.

In Neuroscience it is stated that motor outcome is planned, developed upon body schema. As the body schema (cortical and cerebella) has a high plasticity and adaptation to diminution or enrichment (Ostry 2010 and Bolzoni 2012) it is crucial for physiotherapist to understand and use the underlying mechanisms to enrich the body schema especially in neurological population.

This understanding is a prerequisite **to regain postural control and movement**. Finding oneself in the body, in gravity, in space and environment is essential for postural orientation and postural stability during a movement transition or a task.

A lot of discussion came up regarding the question: Which is the best therapeutic approach to recover function after a neurological disease? Most discussions failed to discuss the problem how damaged brains are able to relearn motor function. (Through exercises/training or real learning) The sentence: “You can only train what you have learned” – gives a clear picture, which is underpinned by Kitago and Levin 2013.

The Bobath Concept was from the beginning focused on relearning “the feeling of a movement” which is done by sensory afferent input, specific facilitation of movement components, and fractionation of movement patterns. This mass of proprioceptive Input enriches the body schema so the patient is able to plan, initiate and perform adequate postural control for stability to do task activities in daily life. Clinical experience through many years show that specific sensory input and facilitation of selective movement change the body schema. After a learning period an individual training and exercise period can consolidate what the patient has learned to create automatic postural control for selective movements and task. It is every time a question of: Why and what are we doing, with which patient, in which moment in time and how. This question needs to be answered by physiotherapists individually so that a patient is able to regain postural control and movements under the consideration of the individual symptoms, which occur through the neurological disease.

Gordana Pošćić (Rijeka, Croatia): NEGATIVE CONSEQUENCES OF DEPRESSION TO RECOVERY OF MOTOR AND COGNITIVE DEFICITS

Depression after stroke is a common and serious emotional disorder and has a long-term negative impact on recovery of the motor and cognitive deficit. Emotional instability, apathy, and loss of interest decrease the possibility of physiotherapy in general.

Rehabilitation of patients after stroke facing the motor control problems is based on their remaining mental and motor abilities and resultant deficits. The goal is to reach the highest level of recovery by treatments aimed at individual needs. Rehabilitation starts as early as possible by different approaches (PNF, Bobath, Constrain Induced Therapy and others) and special equipment (Armeo Spring, Hand/Arm/Leg tutor, Computer Games...) . It rests on the patient's understanding of deficits, his/her attention, memory and motivation to treatment and recovery.

The brain is capable of a high-degree self-repair by changing the pattern of synaptic connectivity dependent on input, activity and experience. Motor Learning is a relatively permanent change in the capability for movement measured after a retention period and as a result of practice only.

An active approach only involving a meaningful and relevant task improves the patient's ability and facilitates Motor Learning and ADL activities. Without physical experience and sufficient time, no skills can be effectively learned and retained.

Emotions are the key for motivation so unless the patient is motivated, effective learning is not likely to occur. If the patient does not believe in recovery/treatment or lacks motivation, this will result in emotional instability or neglect, and less possibility to participate in the treatment with "use it or lose it" in consequence.

Depression, if not treated, can influence on desired participation in activity and/or learning. Willing, leading and individual adaptation to a goal-oriented task, leads up to optimal plasticity. Those who are motivated make more effort during practice, can practice for a longer period, and, in the end, they learn more. Repeated experience of reinforcement and reward lead to learning, changed expectation, changed behaviour, and retained performance and recovery.

Sanjica Vlašić (Zagreb, Croatia): TASK-ORIENTED TRAINING FOR A PATIENTS WITH INVOLUNTARY HYPERKINETIC MOVEMENTS

The aim is to present and discuss the challenges of neurorehabilitation approach in patients with involuntary hyperkinetic movements. Hyperkinetic movement disorder caused by a stroke requires a neurorehabilitation care team. Hemichorea-hemiballism have been most commonly reported after stroke. Physiotherapy may have a significant role to empower the control of involuntary movements using sensory tricks and task-oriented training with automatic antygravity movements. Patients with hyperkinetic movements face a great risk of falling and are prone to self-harm and fractures. In order to prevent patients from possible fractures they need to be provided with cushioning aids such as head protectors. The education of immediate family is necessary so patients could function in their environment. The most commonly reported pharmacological treatments for hyperkinetic movements after stroke have been dopamine receptor blockers, particularly haloperidol.

Marija Miletić, Vladimira Vuletić, Iva Šklempe Kokić (Zagreb, Croatia): INACTIVITY AND SOCIAL ISOLATION IN PATIENTS WITH PARKINSON'S DISEASE

Introduction/Objectives: Parkinson's disease is a progressive neurodegenerative disorder and occurs due to loss of nigrostriatal dopaminergic neurons. In addition to the motor symptoms of the disease, non-motor symptoms can certainly affect the psychosocial aspects.

Physical activity (PA) is one of the most important key points of slowing disease progression. The aim of this study was to prove that physical inactivity leads to social isolation of patients.

Participants, Materials/Methods: In this study IPAQ (International Physical Activity Questionnaire) was used, because it measures multiple domains of PA (household/caregiving, occupational, active livins, sports). Patients completed the self-administered IPAQ regarding the amount of PA and time spent in specific domains of PA within last 7 days. Phi coefficient was used to measure association between three categories of PA level and neuropsychiatric symptoms.

Results: This study included 72 patient. Fifty percent of patients with Parkinson's disease have low level of PA, 33.3% of them have moderate level and 16.7% high level of PA. It is noticed that woman are more depressed than men ($p=0.01$, Phi coefficient - 0.302). High level of PA measured by IPAQ is associated with reduced presence of neuropsychiatric symptoms.

Conclusions: Neuropsychiatric symptoms (depression and apathy) affect quality of life and low level of PA in patients with Parkinson's disease is associated with neuropsychiatric symptoms. Early recognition and prompt treatment of these symptoms could prevent inactivity and social isolation of these patients.

HOW TO WRITE AND READ PAPERS

Antonija Pać (Zagreb, Croatia): HOW TO WRITE A WELL STRUCTURED SCIENTIFIC ARTICLE

Many authors find scientific articles hard to write. At the same time readers and editors, faced with scientific overproduction and pressed for time, require that an article is not only relevant and scientifically sound but well written, meaning – clear, concise and straight-to the point. The purpose of this presentation is to analyze the basic elements of the scientific article (IMRAD), and, more importantly, see how understanding of these elements can help authors to better organize their writing and convey their message in a more straightforward way. The speaker will pinpoint the key problems in writing of scientific articles and provide possible solutions. Also, some practical tips will be given for facilitating the process of writing, which will result in a text that is both accurate and easy to read, and, hopefully, more publishable.

Anton Glasnović. (Zagreb, Croatia): STATISTICAL REPORTING FOR ARTICLES PUBLISHED IN BIOMEDICAL JOURNALS

When analyzing statistics in research articles, journals often face a serious problem of inconsistency and also, unclear information about how raw data was analyzed. That is why medical doctors of all specialties, as well as undergraduate students, who wish to write scientific articles, need to have better knowledge about what is statistics and what are the major points that need to be addressed in the „Statistical Analysis“ paragraph of their manuscript. The most important issues, when it comes to statistics are: pilot study with sample size study, test of normality, tests that were used for certain variables, other models used, such as regression analysis, statistical significance level, and statistical software. All of this contributes to better understanding of the whole study, and what is more, uniformity in reporting scientific data and thus better communication between researchers.

Hrvoje Barić (Zagreb, Croatia): WHY SHOULD WE CARE ABOUT CASE REPORTS ?

Even though case reports (CRs) are indispensable for medical progress, in the evidence based era of impact factors and citations, they are often considered to be less valuable. However, CRs have not only changed and grown more complex in their form, but continue to report on a wide range of important topics other than direct clinical experience. In its beginnings, CRs were intended to identify clinical novelty, while today they play a significant role in medical education and help emphasize ethical predicaments. Throughout the history of medicine, CRs have played a major role, some of them subsequently becoming highly cited works that often represent cornerstone publications in their respective fields. Recently, a group of eminent experts involved in CR writing and editing have addressed the issue of standardizing CRs (the CARE guidelines). The aim is to discuss the current status of the CRs as seen from authors and editors point of view and point out their unique roles in distributing valuable knowledge and experience. Higher level-of-evidence articles (original research, reviews, meta-analyses) are more refined and highly scientific; however, CRs often demand subtle writing and presentation skills. Finally, CRs may prove to be one of the last resorts when trying

Filip Đerke (Zagreb, Croatia): WHAT MAKES A GOOD ABSTRACT ?

The word abstract comes from the Latin *abstractum*, which means a condensed form of a longer piece of writing. There are two type of abstracts: the Descriptive and the Informative abstract.

The abstract of a paper is the only part of the paper that is published in conference proceeding. The abstract is the only part of the paper that a potential referee sees when he/she is invited by an editor to review a manuscript. The abstract is the only part of the paper that readers see when they search through electronic databases such as PubMed.

For the majority of readers, the paper does not exist beyond its abstract. For the referees, and the few readers who wish to read beyond the abstract, the abstract sets the tone for the of the paper. It is therefore the duty of the author to ensure that the abstracts is properly representative of the entire paper. For this, the abstract must have some general qualities.

Young researchers are sometimes confused about the difference between an abstract and introduction. In fact, they are different pieces of writing with different aims and key parts. On the one hand, abstract should summaries briefly the whole paper including the conclusions. On the other hand, introduction introduces the paper and foregrounds issues for discussion.

Although some journals still publish abstracts that are written as free-flowing paragraphs, most journals require abstracts to confirm to a formal structure within a word count of, usually, 200-250 words. The usual sections defined in a structured abstract are the Background, Methods, Results, and Conclusions. Some journals include additional sections, such as Objectives (between Background and Methods) and Limitations (at the end of abstract).

This report provides detailed suggestions, with examples, for writing the background, methods, results, and conclusions sections of a good abstract and also some practical advices about writing process.

5th. SYMPOSIUM ON INTERFACE PROVIDERS IN NEUROREHABILITATION

Raphael Bene (Zagreb, Croatia): CAPTURING BRAIN PATTERNS OF ELITE ATHLETES VIA MOBILE, WIRELESS EEG SENSORS

Each sport involves specific neural networks. An archer will constantly rewire his frontoparietal network while tennis or hockey players will focus more on early visual processing. The aim is the same: develop the skill to predict better and faster the next crucial moment. Once we define the networks involved, our goal is to record, analyse and understand how these networks communicate with each other. In-game EEG recording, using wireless EEG technology, provides great insights into task-specific brain wave dynamics. To do so, we created Brainalyser, a real time video- wireless EEG recording software, to build a database of elite, expert and amateur players in each sport. We already collect the brain waves of elite athletes (dozens of olympic, world and continental medal winners) that allows us individual neurofeedback training for recorded athletes and dedicated algorithms for cognitive enhancement.

Natko Beck (Zagreb, Croatia): APPLYING NEUROSCIENTIFIC FINDINGS: A MOBILE, MUSIC-NOTCH THERAPEUTIC TOOL FOR TINNITUS

Tinnitus is a symptom described as a loud, permanent, ringing in the ear affecting 3-5% of the population. We created a mobile app based on “tailor made notched music therapy”, where you listen to music with tones around your tinnitus frequency damped out. After prolonged exposure to such therapy, brain starts to ignore these frequencies and your tinnitus loudness reduces. We are proud that the beta test of our software included more than 2500 users. More than 250 filled out our questionnaire, sending us excellent feedback.

Miroslav Vrankić (Rijeka, Croatia): DEVELOPING ALTERNATIVE COMMUNICATION INTERFACES FOR DISABLED COMMUNITY

People in locked in state (LIS) are usually considered to be in unconscious state by the care givers, which is also often not true. In this state the person is completely conscious and his brain still actively responds to external stimuli like sensory, visual or auditory. With Brain Computer Interface (BCI) one can detect electrical impulses of the brain in the form of continuous signal, we are using this technique to detect these responses to stimuli. In this particular case we observe the electroencephalography (EEG) signals of the user to find response to stimuli for auditory stimulus. Auditory event related potentials (ERP) for responses to target and non-target are obtained after a simple averaging of the EEG data. The experimental setup and EEG acquisition algorithm is been explained in detail. Current data acquisition is done with test subjects. Our BCI communicator is compared with the visual P300 system. Further research will be focused on data analysis and classification in order to design a real time classifier for auditory response to stimuli.

Ines Delzotto (Pula, Croatia): PULA'S CENTRE FOR ASSISTIVE TECHNOLOGY: PRESENT AND FUTURE

Day center for rehabilitation Veruda Pula has established a Centre for Assistive technology which is focused on a children with disabilities and people with long term conditions. We help children find effective tools and strategies , we help our clients, their families and community members learn how to use the tools in their daily lives. These range from simple low-tech to high-tech computerized systems. Services include assesment, consultation, training and follow-up for Augmentative and Alternative Communication, adapted computer access and enviromental controls

Viktor Peršić (Opatija, Croatia): PROJEKT SILA: SPORT INTERFACE LAB IN OPATIJA

SportLab is a joint venture of Thalassotherapia Opatija and Core Interface. TTO is a well known health institution, center of excellence in cardiac rehabilitation, and one of the leading facilities in rehabilitation and diagnostics. We provide healthcare at top level as well as wellness and beds. Opatija is small and beautiful, placed under hills at the coast of the adriatic, with 4 airports in 2 hours range, next to the city of Rijeka. It has a long history and tradition of tourism and health tourism, excellent mediterranean food, clean water and air. This year TTO will build a Sport Center, which is basically SportLab and services. Opatija and surroundings offer spectacular outdoor training possibilities as well as indoor sport facilities.

NEUROSCIENCE AND ART – Student Session**Filip Đerke, Diana Culej, Luka Filipović-Grčić, Martina Bukovac M, Tihana Katić, Zrinka Rajković (Zagreb, Croatia):
NEUROAESTHETICS**

Neuroaesthetics is a field of experimental science that aims to combine neuroscientific and psychological research with aesthetics by investigating the perception, production and response to art, as well as interactions with objects and scenes that evoke an intense feeling, often pleasure. It is both descriptive and experimental, with qualitative observations and quantitative tests of hypotheses, aimed at advancing our understanding of how humans process beauty and art.

Aesthetics has a complex history. The term derives from the Greek "perception" and was coined by Alexander Baumgarten in 1750 as the study of sensory knowledge. But following Immanuel Kant's *Critique of Judgment* in 1790, aesthetics began focusing on the concept of beauty, in nature and art. These three connotations: perception, beauty and art; point in different directions but are conflated in neuroaesthetics. This term, coined by Zeki in 1999 refers to the investigation of beauty perception of neural bases in art. The current report, mainly focuses on visual art through a neuroscientific view. Zeki's approach to art lies on his precise understanding of what is called the seeing brain and focusing on constants.

A recent study claims that "all works that appear beautiful to a subject have a single brain-based characteristic, which is that they have as a correlate of experiencing them a change in strength of (fMRI) activity within the medial orbitofrontal cortex (mOFC). There is high activation in this region when a person views paintings which they consider beautiful. Additionally, the prefrontal dorsolateral cortex (PDC) is selectively activated only by stimuli considered beautiful whereas prefrontal activity as a whole is activated during the judgment of both pleasing and unpleasing stimuli. Most neuroimaging studies highlight neural networks that underline aesthetics judgments across participants rather than explore individual differences. However, a focus on shared responses among viewers leaves unexplored the unique component of individual taste and its corresponding neural correlates.

In this review we used expert opinions and recent literature to present a report on how neuroscience has so far elaborated on different features of the aesthetics phenomenon, hoping to probe areas of neuroaesthetics research which can potentially assess our cultural interface with the aesthetics and cognitive neuroscience.

**Diana Culej, Martina Bukovac, Luka Filipovic-Grcic, Tihana Katić, Zrinka Rajković, Filip Đerke (Zagreb, Croatia):
MUSIC & MOVEMENT & BRAIN**

Sound, the stimulus for the auditory system, is produced by changes in air pressure, which form complex waves. Sound waves have three key qualities: frequency, amplitude and complexity. Combination of these qualities allows the auditory system to comprehend sound as music or language. The auditory system has a complementary specialization in the cortex: in the right handed people, right side of the cerebral cortex is responsible for music-analyses.

For over twenty years there is a surprising claim that, after listening to Mozart's sonata for two pianos (K.448) for 10 minutes, respondents have had significantly better spatial reasoning skills than after period of relaxation instructions designed to lower blood pressure or after silence. The mean spatial IQ scores were 8 or 9 points higher after listening to K.448 than in other two conditions. However, the enhancing effect did not extend beyond 10-15 minutes. In children with epilepsy, K.448 has shown a significant effect in reduction of epileptiform discharge. The most famous example of right-hemisphere predominance for music processing is seen in a composer Maurice Ravel who suffered a left-hemisphere stroke and developed aphasia while at the peak of his career. Many of Ravel's musical skills remained intact: he could still recognize melodies and pick up tiny mistakes in music that he heard being played. However, skills that had to do with musical composition were among those that were destroyed. For instance, Ravel could no longer recognize written music, play the piano, or compose. Apparently, left hemisphere plays at least some role in certain aspects of music processing, especially those that have to do with musical composition. Music also plays an important role in the acute recovery phase of neurological rehabilitation. Patients with a cerebrovascular insult were randomly assigned to music group, language group, or control group. During the following two months, the music and language groups listened daily to self-selected music or audio books, while the control group received no listening material. All patients received standard medical care and rehabilitation. Recovery of verbal memory and focused attention improved significantly more in the music group than in language and control groups. In addition, music group experienced less depressed and confused mood than control group. Not only music, but also, constant induced movement therapy during two weeks of the acute recovery phase revealed significant improvement in those patients.

Clearly, music is widely beneficial to the mind and body and is generally well received by patients with any kind of emotional, mental or physical disease. There is a need for it to be integrated within patients supportive care. For further evaluation of musical and movement therapy, quantitative electroencephalograph (qEEG) brain mapping and functional MRI (fMRI) may help us to determine not only which parts of the cerebral cortex are activated, but also predict the prognosis of the recovery.

**Luka Filipović-Grčić, Diana Culej, Martina Bukovac, Tihana Katić, Zrinka Rajković, Filip Đerke F. (Zagreb, Croatia):
FINE ARTS & BRAIN**

Historically, the five main fine arts include sculpture, painting, architecture, music and poetry, with performing arts including theatre and dance. Today, the fine arts commonly include additional forms, such as film, photography, conceptual art, and printing. In this article I will first and foremost deal with the perception of sculpture and painting. I shall also explore and present different theories of evolution of arts through history. Was it just a mean for attracting mating partners via advertising one's own creative abilities? What role do fine arts play in our everyday life, and how it came to be that way. Art is a form of communication, through art one expresses him or herself, as well as receives more or less subtle information. When one enters, for example, the St. Peter's in Rome, how does he or she feel, what do they experience and what happens in their brains? How does that building, the art works it holds, the „Gesamtkunstwerk“ it represents, how does all that communicate with its visitors? One definition of art speaks of it as a deliberate setting of things which is intended to evoke emotional response in the observer. The process of visual perception is relatively clear and well researched, from rods and cones, through optic nerve to the primary visual cortex in occipital lobe. What happens after that is relatively unclear, and some of the researches carried out concerning the mechanisms behind the perception of art will be tackled in this work. One of the important puzzle pieces in this mosaic are mirror neurons. They represent a special breed of nerve cells, that activate during the observing of a meaningful or purposeful action. They enable the humans and some other mammals to interpret the body language of others, to give meaning to their actions, and as such are held responsible for assuming the intentions, motivations and mental states of an observed individual. In a word, they may be the key behind the „Theory of mind“, which in turn is responsible for compassion, but also for experiencing a work of art. In other words, one does not necessarily have to witness a specific action to produce an emotional response, but a mere representation of it is enough to produce such a response. Beside mirror neurons there is a multitude of other cells (such as von Economo neurons) and neuronal circuits that are thought to play different roles in art perception. With growing knowledge concerning this field we may be close to examine one of the most important claims of all time, that that the beauty is in the eyes of the beholder.

Zrinka Rajković, Tihana Katić, Diana Culej, Martina Bukovac, Luka Filipović-Grčić, Filip Đerke (Zagreb, Croatia): ART THERAPY IN NEUROPSYCHIATRY

Recent findings showed that brain plasticity is not only limited to early development but can also be found throughout the life span. We also know that art-making helps us to rebuild synapses and change brain's architecture and function. Therefore, art therapy gives us a unique opportunity to manipulate with selected art forms such as movement, imaging or touch to increase neuronal activity, which stimulates dendrites and synaptic activity and thickens gray matter. These findings are highly used in clinical practice for therapeutic care and in a variety of healthcare facilities. There is a whole range of theoretical paradigms in art therapy that share a common procedure which uses creative art as a method for healing. In this article, authors discuss connections between art therapy and brain function among individuals with mental disorders. The article presents ADHD, autism, schizophrenia, depression and people who have suffered trauma with focus on PTSD. Furthermore, authors will present different types of art therapy used for treating people who have these mental health issues. Caused by hyperactive deficit, children with ADHD have social difficulties which result in fewer friendships made. That is why play therapy is a great way to improve interaction within a social context and empathy among these children. Music therapy will be presented by an example of treating autism spectrum disorders. Through music-making therapy, children show improvement in interaction with others and development in communication and social skills. Furthermore, therapy offers a promising approach in helping nonverbal children with autism. This is because every kind of art therapy provides equal opportunities to all individuals to express themselves in a way that suits them best. However, schizophrenia is a heterogeneous condition and in its treatment, different forms of art therapy can be used. The most commonly used is painting therapy, making collages and clay therapy. All the forms will be presented in this paper. Authors will also present dance therapy, which was showed to be a good way of healing depression because it stimulates both brain's hemisphere. It will also be shown that art therapy can be used to treat people who suffered trauma. Different forms of art therapy exist that can be adjusted to an individual, and it will be shown that drama therapy can better the mental health of these people. Why is art therapy so widely used? There are many reasons, but what is important to remember is that the brain does not know the difference between proces' used to create a scientific creation and a work of art. Because of that, we can use art therapy to manipulate the brain.

Alen Juginović, Marko Grahovac, Jeronim Matijević, Josip Andelo Borovac JA.(Split, Croatia): NEUROAESTHETICS, DREAMS, AND DRUG-INDUCED NIGHTMARES: A LITERATURE REVIEW

Introduction: The aesthetics of a good sleep and comfortable dreams are important in a daily living. Nightmares are commonly reported as one of the many possible side-effects of different drug classes, especially those that are psychotropic and affect the central nervous system (CNS). However, the clear establishment of etiology of drug-induced nightmares is not an easy task since nightmares and fear-driven dream experiences occur, by large, in a healthy adult population as well. The aim of this review was to identify and elaborate on the most common, regularly prescribed pharmacological agents that are associated with nightmares.

Materials and Methods: This review included the PubMed (MEDLINE) available case reports, original articles, and data gathered from registered clinical trials that reported nightmares or similar disturbances in dream architecture that were associated with medication usage. Search terms used were: nightmares; drug, induced, treatment.

Results: The drugs that belong to serotonin-norepinephrine reuptake inhibitors (SNRI) class such as venlafaxine and selective serotonin reuptake inhibitors (SSRI) such as fluoxetine were often brought in association with nightmare-like CNS side-effects. Furthermore, melatonin agonists such as ramelteon that act on MT1 and MT2 receptors were associated with nightmares. Mirtazapine and bupropion, the atypical antidepressants with serotonergic and noradrenergic activity have been widely associated with nightmare episodes. Likewise, hypnotic drugs such as zolpidem and cholinesterase inhibitors (donepezil) were reported to induce nightmares. Some antiviral drugs, such as efavirenz, a non-nucleoside reverse transcriptase inhibitor (NNRTI) used for the treatment of HIV infection has been brought into connection with nightmares that persisted up to several weeks. Antimicrobial drugs like erythromycin have been associated with recurrent nightmares. Finally, beta-blockers such as metoprolol, bisoprolol and propranolol were reported to induce sleep disturbances and nightmares in a multitude of studies. On the other hand, selective α 1-adrenergic antagonists such as prazosin and terazosin were found effective in the treatment of trauma-related nightmares and in patients who suffer from post-traumatic stress disorder (PTSD). The proposed mechanism of this effect is a decrease in noradrenaline transmission at α -1 receptors.

Conclusions: The drugs that were most frequently associated with nightmares belong to beta-blocking, amphetamine and sedative/hypnotic classes of drugs. Recent evidence also suggests that antiviral NNRTI drugs may trigger nightmares and neuropsychiatric complications through a class effect. Therefore, implicated pharmacological mechanisms that induce nightmares are most likely mediated by the action of neurotransmitters such as serotonin, dopamine, melatonin, and norepinephrine, but precise workings are yet to be elucidated.

JOINT MEETING WITH ALPS-ADRIA NEUROSCIENCE SECTION AND CENTRAL AND EASTERN EUROPEAN STROKE SOCIETY AND WFN APPLIED RESEARCH GROUP ON THE ORGANIZATION AND DELIVERY OF CARE

Vida Demarin (Zagreb, Croatia): LIFESTYLE MODIFICATION IN PRESERVING BRAIN HEALTH

Brain diseases are frequent, causing disability and changes in the quality of life of the patients and their families, as well with the huge social and financial burden. According to European Brain Council costs of brain disorders in Europe are 798 billions of Euros per year, what is one third of the whole health expenditure per year, with stroke contributing a great deal to this situation.

In spite of huge development in the management of stroke, with stroke units, thrombolytic therapy, endovascular treatment, neurosurgical and vascular surgical treatment, primary prevention of stroke is still one of the most important contributors to the brain health.

Adequate blood supply of the brain is prerequisite for brain health with control and management of behavioral, environmental and metabolic risk factors.

The four most important keys for healthy brain are in our hands: healthy nutrition (Mediterranean Diet), regular physical activity, stress management and „brain fitness“.

The importance of nutrition in preserving the brain health is a subject of investigation for many years, pointing out the role of polyunsaturated fatty acids from fish consumption, abundance of fruits and vegetables, whole grains, olive oil and red wine, what are all main ingredients of Mediterranean Diet. The adherence to this diet leads to improved endothelial function, increased plasma antioxidant capacity and reduction of insulin resistance, what contributes to prevention of stroke, neurodegenerative disorders, metabolic syndrome etc.

Regular physical activity increases the level of BDNF what is of utmost importance for cognitive functioning and decreased risk for depression.

Control and management of stress in a daily living is the third key in preserving healthy brain especially important nowadays when human circuits are overloaded and people are bombarded with constantly changing mental challenges. It is estimated that we encounter a thousand times more events per year than our great-grandparents did, but the time available for decision-making remains the same or even less. In the era of person-centred approach, techniques for stress relief should be individually tailored and stress should be properly managed.

And the fourth key, again something what we can practice by ourselves is an array of different brain fitness tasks which contribute greatly to healthy brain.

Hrvoje Budinčević (Zagreb, Croatia): COGNITIVE DECLINE IN PATIENTS WITH ATRIAL FIBRILLATION

Atrial fibrillation is well known risk factor for ischemic stroke. Anticoagulant therapy is a gold standard for secondary prevention of ischemic stroke in patients with atrial fibrillation. One of the relative contraindication for usage of anticoagulant therapy in stroke prevention is dementia and cognitive decline. Alzheimer's dementia and vascular dementia are sharing risk factor, which are common stroke risk factors. Recent data suggest that the atrial fibrillation might be independent risk factor for dementia and cognitive decline development. Cognitive decline is also associated with cryptogenic strokes and may be related to previously undiagnosed atrial fibrillation. The current dilemmas regarding atrial fibrillation and development of dementia/cognitive decline will be discussed.

Azra Alajbegović (Sarajevo, Bosnia and Herzegovina): PREVENTIVE TREATMENT FOR PRIMARY HEADACHES

International Classification of Primary Headache makes distinction among: migraine, tension and cluster headaches. All three can be prevented by medications and by removing so called precipitating factors. For primary headaches we have available non-pharmacological and pharmacological treatment. Non-pharmacological treatment includes preventive measures and identifying strategies to avoid precipitating factors for headache episodes. An important role plays psychological counseling sessions, relaxation exercises, psychotherapy, lifestyle and change habits in daily activities.

Pharmacological measures are prophylactic measures.

Prophylaxis usually starts with low doses of medications, which are gradually increased until satisfactory effect is achieved. The therapy is carried out continuously for 6 to 12 months, and then gradually discontinued. Patients usually does not require further treatment, or if episodes repeat, the therapy is repeated for a period of 6-12 months. Beta blockers are the first drug of choice. They have minor side effects in small doses. During the first two weeks can cause a transient increase in headache intensity. The exact mechanism of action on migraine is unknown. It is assumed that they have the inhibitory action on adrenergic neurons in the CNS through the beta receptors. Antagonists of 5-HT₂ serotonin receptors. Activation of 5-HT₂ receptors has important implications for migraine episodes: vasoconstriction of cranial blood vessels, increased permeability of capillaries, platelet aggregation, and a central neuroexcitation and neuroendocrine followed by changes in behavior. Methysergide is an ergot derivative. Because of the side effects may only be used if other means fail, and not for more than 3 months. Prolonged use can cause retroperitoneal, endocardial and pulmonary fibrosis in rare cases. Pause in therapy last for at least two months. Pizotifen has less pronounced side effects than methysergide, but is less effective. Calcium channel blockers (flunarizine, nimodipine, verapamil) were used in migraine prophylaxis, but have generally shown disappointing results. Anticonvulsants. Valproate has a GABA mimetic activity, so it is considered to act on GABA receptors in the nuclei raphe dorsalis thereby inhibiting excitation of serotonergic cells. Gabapentin has a similar action. Nonsteroidal anti-inflammatory drugs. Acetylsalicylic acid in low doses reduces the incidence of seizures up to 20%. Particularly useful is the administration of naproxen (for at least 3 months) in the prevention of menstrual migraine. Antidepressants. Amitriptyline is useful in preventing migraine episodes, regardless of its antidepressant effect. Specific serotonin reuptake inhibitors should be avoided due to serotonin syndrome. Magnesium and riboflavin supposedly reduce the frequency of migraine seizures. Clonidine was initially considered to be effective drug in the migraine prophylaxis, especially in dietary induced forms. In later studies in small doses it did not show satisfactory effect.

Prophylactic treatment of chronic tension headaches

Antidepressants. The drug of choice for prophylaxis of chronic tension headaches (CTH) is amitriptyline. Administered in the initial dose of 25 mg in the evening, which can be increased up to 100 mg/day. It is effective in the prophylactic treatment of migraine, but not in the treatment of episodic tension headache. It reduces the duration and frequency of headaches, but not its intensity. Side effects are: dry mouth, sedation, urinary retention, weight gain, contraindications are heart block, glaucoma, and use of MAO inhibitors. Selective serotonin reuptake inhibitors do not have even close effect than non-selective tricyclic antidepressants, and it is assumed that in addition to blocking serotonin reuptake in tension headache, there are other mechanisms of action of these drugs. Valproate is used in the prophylaxis of chronic daily headache with tension elements which has occasionally migraine properties. Dihydroergotamine is also used in breaking the cycle of chronic daily headaches (CAUTION: The possibility dependency development and rebound headaches). Botulinum toxin A is used more and more in order to prevent migraine and chronic tension-type headache. The current attitude is that it should be used in the treatment of chronic tension-type headache when other pharmacological treatments fail (alternative therapy).

Cluster headache

Justified is the use of corticosteroids in preventing repeat episodes of pain and shortening of the cluster. It may be administered orally, prednisone 40 mg/day for 5 days, then 30 mg for 5 days and gradually decrease until discontinuation of treatment after following 11 days. Contraindicated is administration in case of psychological changes, diabetes and peptic ulcers.

Bojana Žvan (Ljubljana, Slovenia): SLOVENIAN NETWORK TELSTROKE (TELEKAP) - OUR EXPERINECES AFTER A YEAR AND HALF OF FUNCTIONING

Introduction/Objectives: A TeleStroke network is an effective way to extend quality acute stroke care to remote hospitals and to improve patient outcomes. It has grown remarkably in the past decade and has entered mainstream care for patients with acute stroke worldwide. The ESO and the AHA/ASA have both issued guidelines encouraging the formation of TeleStroke networks. Slovenia is predominantly rural region covering 720.273 km² and a population of 2 million, and approximately 4.300 stroke patients, annually. Prior to the beginning of telemedicine, there were 4 regional centers providing thrombolysis 7 days a week, 24 hours a day. Projected ambulance travel time was more than 60 minutes from peripheral centers to either one of these 4 regional centers. This motivated horizontal organization of the program which has already started at September 15. Our TeleStroke network enables patients suffering acute stroke to be remotely evaluated in 12 our hospitals, allowing optimal treatment and management in clinically underserved areas and removing geographical disparities in access to expert care.

Our system, called TeleKap, is based on video examination and evaluations of brain scans via teleradiology. It promises to extend the benefits of intravenous thrombolysis to patients in nonspecialized hospitals and advantages in rural landscapes by minimizing dependence on regional transport services and developing rehabilitation and follow-up care for patients closer to where they live. Beyond thrombolysis we have also benefit for immediate decision making in acute stroke, e.g. for triage of patients for mechanical revascularisation. Telemedicine are also used for secondary stroke prevention, rehabilitation, education and long-term stroke care.

Participants, Materials/Methods: Prospective registry data from 2014 to the end of January 2016 describe processes of all consecutive stroke and TIA patients in 12 TeleKap hospitals in Slovenia.

Results: Up until the end of January 2016, we performed 2581 consultations for 702 patients. Number of thrombolysis increased to 43.1 % of all strokes within the TeleKap network. Door-to-needle time has been in UMC Ljubljana 40 minutes, while in all hospitals at the same time 68 minutes. Mechanical revascularisation was performed in 7.4 % of acute stroke patients. Recommendations of secondary interhospital transfers decreased from 95% to 30 %.

Conclusions: Registry data of the national telestroke network suggest sustainability of the telemedical consultation services within 17 month period and relevant improvement in the delivery of thrombolysis. It is essential to further reducing the time of stroke onset to acute treatment.

MLADI PSIHIJATRI: ULOGA PSIHOLOŠKIH TEHNIKA U PROPISIVANJU LIJEKOVA

U sekciji „Uloga psiholoških tehnika u propisivanju lijekova“, na početku će prof. Marčinko održati kratku prezentaciju vezano uz važnost poznavanja psihodinamike kod propisivanja psihofarmaka. Nakon toga će prim. Vuksan Ćusa, iznijeti nove spoznaje vezano uz granice između bipolarnog afektivnog poremećaja i graničnog poremećaja ličnosti, uz naglasak na važnosti psiholoških tehnika u tzv. biologijskoj psihijatriji. Zatim će specijalizantica psihijatrije, dr Ivana Pedišić Šerka, prikazati seansu psihoterapije i prikaz bolesnika kod kojeg postoji problem suradljivosti vezano uz uzimanje lijekova. Supervizori prof. Marčinko i prim. Bilić, komentirati će glavna obilježja psihoterapijske seanse, a predviđen je i prostor za otvorenu diskusiju svih sudionika sekcije.

PRISTUPI RAZUMIJEVANJU I LIJEČENJU DEPRESIJE U HRVATSKOJ

Alma Mihaljević Peleš (Zagreb, Croatia): HRVATSKE SMJERNICE ZA LIJEČENJE DEPRESIJE / CROATIAN GUIDELINES FOR THE TREATMENT OF DEPRESSION

In the year of 2013., the expert group of three largest Croatian psychiatric associations presented the common guidelines for the treatment of depression. The guidelines were published in the supplement of the journal Medix in July 2013. Guidelines for the treatment of depression were based on a variety of psychiatric guide of different world psychiatric association and Croatian clinical practice. They are intended for the treatment of depressive episodes in adults as well as in children and adolescents in clinical psychiatric practice and in the practice of general practitioners.

The guidelines include a variety of actions that contribute to the successful clinical management of patients with depression. The guidelines serve for developing individualized treatment plan for each patient. Here are shown guidelines only for use of psychopharmacological drugs with the recommendations of the first, second and third choice of treatment. Guidelines for psychotherapeutic treatment, methods of self-help and psychosocial methods are not going to be shown. The guidelines emphasize the importance of individual treatment and establishing a relationship of trust and therapeutic alliance. They help physicians in making decisions concerning, planning and choosing treatment for patients in everyday practice and contribute to the quality and effectiveness of treatment.

Marina Šagud, Bjanka Vuksan-Ćusa, Alma Mihaljević-Peješ, Maja Bajs Janović (Zagreb, Croatia): BDNF I DEPRESIJA / BDNF AND DEPRESSION

Brain-derived neurotrophic factor (BDNF) is an important neurotrophic factor, which is involved in neurogenesis and neural plasticity of the brain, particularly hippocampus and cortex. In addition to brain tissue, BDNF is also present at periphery. Circulating BDNF levels could be measured in plasma, serum, whole blood and blood cells. Changes in BDNF gene transcription are involved in the pathogenesis of a wide range of psychiatric disorders, including depression. There is a complex relationship between BDNF levels, inflammation, serotonergic system, NMDA receptor activation and GABA signalling. While peripheral BDNF levels are decreased in drug-free patients with depression, antidepressants were reported to normalize those abnormalities. While increase in serum BDNF concentration has even been purposed as a screen for novel antidepressant agents, there were also negative results. Increase in peripheral BDNF level was reported with antidepressants with different mechanisms of action, such as SSRIs, mirtazapine, milnacipran and vortioxetine. However, the relationship between peripheral BDNF levels, cognition, and response to treatment remains to be determined in future studies.

Maja Bajs Janović (Zagreb, Croatia): DEPRESIJA U SLIKOVNIM PRIKAZIMA MOZGA

Depresija je poremećaj s značajnim neurobiološkim promjenama koje, prema današnjim saznanjima, uključuju strukturalne, funkcionalne i molekularne promjene u nekoliko regija mozga. U razvoju i oporavku od depresije, ulogu ima neuralna mreža koju tvore neurotransmitorski sustavi u mozgu. Povratni i kronični tijek depresije upućuje na neurobiološke promjene. Postoje pokazatelji da je liječenje antidepressivima povezano s promjenama fiziologije mozga, kao i terapijski odgovor. Tehnike slikovnog prikaza mozga i druge metode omogućile su po prvi put otkrivanje neurobioloških promjena u depresiji.

U regulaciju raspoloženja uključeno je nekoliko prefrontalnih i limbičkih struktura i njihova mreža. U depresivnih se osoba nalaze značajne promjene upravo u tim regijama u usporedbi sa zdravim osobama i stoga te regije predstavljaju temelj za daljnja istraživanja. Ipak, zasada se neuroanatomski nalazi još ne mogu smatrati patognomoničnima.

Slikovni prikazi mozga depresivnih ispitanika pokazuju redukciju volumena u sivoj i bijeloj tvari, proširenje sulkusa, pad metabolizma glukoze i promjene u protoku krvi u prefrontalom korteksu, smanjenje volumena hipokampusa i reaktivno povećanje amigdala. Recentnija istraživanja spektroskopijom putem magnetske rezonancije (MRS) omogućuju mjerenje razine specifičnih biokemijskih tvari u mozgu. Nedavni razvoj kliničkih mogućnosti MRS-a doprinosi otkrivanju potencijalnih neurokemijskih promjena u mozgu, povezanih s patologijom i liječenjem depresije. Istraživanja u depresiji usmjerena su na glutamat, glutamin, GABA, laktat i glutation, N-acetilaspartat (NAA), kolin, kreatin, i mioinozitol te povezanost promjena navedenih metabolita u odnosu na kliničke značajke depresije, terapijski odgovor i ishod liječenja. I dalje je predmet istraživanja koje su strukturalne, funkcionalne i stanične promjene mozga u depresiji uzrok ili posljedica depresivnog poremećaja. Istraživanja više govore u prilog neurorazvojnoj osnovi depresije.

Istraživanja mozga u depresiji putem slikovnih prikaza također imaju za cilj identificiranje mogućih bioloških markera za depresiju, težinu depresije, oporavak od depresije i terapijski odgovor. Biomarkeri su značajni za individualizirani pristup u liječenju depresije i praćenju ishoda, što će doprinijeti boljoj učinkovitosti liječenja. Dosadašnji rezultati nedvojbeno demonstriraju da depresija ima učinak na mozak i da je povezana s disfunkcijom specifičnih regija u mozgu, koji su naročito uključeni u kognitivnu kontrolu i emocionalni odgovor.

Željko Milovac, T. Gajšak, V. Aljinović, S. Sučić, S. Zečević Penić, E. Ivezić, Igor Filipčić (Zagreb, Croatia): PRVA ISKUSTVA LIJEČENJA TMS-OM U HRVATSKOJ / First experiences using TMS in Croatia.

Introduction/Objectives: Repetitive transcranial magnetic stimulation (rTMS) is a neurostimulation and neuromodulation technique. It is based on the principle of electromagnetic induction of an electric field in the brain and it is used in noninvasive treatment of various neuropsychiatric conditions. The Psychiatric Hospital “Sveti Ivan“ is the first hospital in Croatia to perform rTMS in therapeutic purposes. Hereby we present our first experiences.

Participants, Materials/Methods: Twenty one outpatients and inpatients with diagnosis of major depressive disorder, schizoaffective disorder, bipolar disorder, anxious depressive disorder, pathological gambling and alcohol dependence have been treated with rTMS technique in our hospital so far. Those patients had refractory depressive symptoms. We delivered rTMS to the left dorsolateral prefrontal cortex at 120% motor threshold (10 Hz, 4-second train duration), 3000 pulses per session for a minimum of 4 weeks using a figure-eight coil. Each patient received a minimum of 20 sessions. Eleven patients completed the protocol and six patients are currently in treatment. There were three dropouts. One patient received other type of protocol. All patients continued taking psychopharmacotherapy during their rTMS treatment.

The following measures were used to evaluate the efficacy of rTMS: the Clinical global impression scale (CGI), the Hamilton anxiety rating scale (HAMA), the Beck depression inventory (BDI), the Beck hopelessness scale (BHS) and the WHO quality of life (WHOQOL) - BREF questionnaire. The clinicians and patients completed these measures before and after completion of the treatment protocol.

Results: While the clinicians assessed patients' depressive symptoms, anxiety and the global severity of their illness as significantly reduced upon completion of rTMS treatment ($z= 2.807, p= .005; z= 2.533, p= .011$ and $z= 2.153, p= .031$, respectively), the patients reported no significant changes in their depression and hopelessness scores. Nevertheless, patients described their overall quality of life as significantly improved after the treatment ($z= 2.016, p= .044$), particularly with regard to their psychological health ($z= 2.194, p= .028$).

Conclusions: Notwithstanding the limitations of this study due to its preliminary nature, it can be concluded that the first experiences using TMS in Croatia are encouraging. Further research is required to assess the efficacy of rTMS, as well as its potential long-term outcomes.

WORKSHOPS**Marinko Rade (Rovinj, Croatia, Kuopio, Finland): BETWEEN NEURORADIOLOGY AND NEUROPHYSIOLOGY; NEW INSIGHTS IN NEURAL MECHANISMS**

Starting from the assumption that nerves are not simply inert tubular structures limited to the conduction of sensory and motor information, but that they do also show inherent protective mechanisms that may impact on their very function, this lecture is going to present arguments to support the notion that i) nerves move, and that their movements can be quantified using appropriate non-invasive techniques, and ii) the human body does present some innate mechanisms to protect nerves from excessive mechanical forces, iii) these movements can be predicted and shaped to fulfil our diagnostic and rehabilitation therapy purposes.

In this lecture data collected from non-invasive investigation techniques (T2 weighted turbo spin echo fat saturation magnetic resonance sequences, Diagnostic ultrasound), as well as from cadaver investigations, will be presented to visualize longitudinal and transverse neural sliding in relevant clinical regions as lumbar spine and carpal tunnel. Following this, principles defining the neural biomechanics will be presented (Neural convergence principle, Principle of linear dependence).

Furthermore, surface electromyography data will be presented to show innate body protective mechanisms naturally employed to protect peripheral nerves by i) avoiding further elongation of neural bed, ii) shortening the neural pathway in order to decrease tensile stress.

With the cumulative results shown in the published literature, in which nerves are shown to move in response to body movements and muscular protective mechanisms in response to mechanical stress applied on peripheral nerves are proved to exist, it is hypothesized that the sliding of neural structures in anatomical tunnels and canals may be a protective effect which preserves the spinal cord, neural roots and peripheral nerves from strain and compression, and that inherent protective mechanisms are activated in case sliding effect fails. Following this line of reasoning, the preservation of free longitudinal and transverse sliding of neural structures in these tunnels and canals might be the *conditio sine qua non* for maintaining an asymptomatic situation. Importantly, it seems that these reactions do bear aspects of predictability that can be used for both diagnostic and therapeutic purposes by formulation of systematic approaches.

Doris Kutscher Meurer (Neuenkirchen, Germany): IMPLICATION OF AFFERENT SENSORY INPUT AND MULTIMODAL INTEGRATION FOR POSTURAL CONTROL AS A BASIS FOR FUNCTIONAL TASKS - THE BOBATH CONCEPT

Human beings develop their potential for moving and function on the basis of the development of the body schema. Afferent sensory information of all modalities are interconnected to a three dimensional picture in the parietal temporal lobe. The body schema needs a constant update through sensory afferent input of internal and external resources to plan the adequate movement strategy in that moment in time and in the environment.

New research shows that the body schema is highly adaptable and this is depending on sensory afferent information through active movement. Non-use of paralysed limbs will reduce the body schema dramatically within 12 hours and this will cause great difficulties in activation of the motor areas of the paralysed limbs.

In this workshop we will learn which possibilities the physiotherapy has to intervene in patients after stroke to enrich the body schema. Through which pathways and interconnections we can influence the sensory integration in the CNS to improve motor control.

A case report and a personal lab will underpin this.

Gordana Pošćić (Rijeka, Croatia): FACILITATION OF MOTOR LEARNING IN GAIT

Patients after stroke have more or less problems in gait. They lose the midline and the gait becomes difficult to control and unsecure. First, PNF facilitates midline in different position together with head positioning. Head movement and vestibular system help them to feel the midline. Working on mats helps the patients to feel secure and have no fear of fall and it is ideal for teaching them to roll and make other transfers to be able to get up or to get ready for walking. By working in standing position, we train appropriate weight bearing and structure of every phase of the walking cycle, especially the stance phase. Immediately after, we ask for an activity level because there is no Motor Learning without walking itself. We do many repetitions without repetition, which means different condition of the surface, uphill/downhill and stairs, which help them for to gain better plasticity and maintain the performance.

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1. BRAIN-DERIVED NEUROTROPHIC FACTOR ASSOCIATES WITH GRAY MATTER VOLUMES IN BIPOLAR DISORDER

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Introduction/Objectives: Bipolar disorder (BD) is a chronic and severe psychiatric illness characterised by a cyclic alternation of manic and depressive episodes. Strong evidences reported both gray matter (GM) and white matter alterations that have been suggested as possible biomarkers for BD. Neurotrophins have been suggested to play a role in the neuroprogressive changes during the illness course. In particular Brain-derived neurotrophic factor (BDNF) has been proposed as a potential biomarker related to disease activity and neuroprogression in BD. The aim of our study was to investigate if serum levels of BDNF were associated with GM volumes in BD patients and healthy controls (HC).

Participants, Materials/Methods: We studied 36 BD type I patients and 17 healthy controls (HC). Both patients and HC underwent magnetic resonance imaging and blood sampling. Brain imaging volumetric T1-weighted sequences were acquired on a 3.0 Tesla scanner. Images were analyzed using Statistical Parametric Mapping software (SPM8) and the voxel-based morphometry (VBM8) toolbox. BDNF serum levels were analyzed using the bead-based Luminex system. First, we investigated the effect of diagnosis on regional GM volumes in the whole brain through an analysis of variance (ANOVA). Second, we searched for an interaction effect of diagnosis with BDNF on GM volumes. Threshold for significance was $p < 0.05$, Family Wise Error (FWE) corrected for multiple comparisons. All the analyses were controlled for the effect of nuisance covariates known to influence GM volumes, such as age and sex.

Results: The comparison between BD patients and HC revealed a reduction of GM volumes in bipolar patients in several limbic, frontal and temporal areas. The interaction analysis between BDNF levels and diagnosis showed a significant effect in the middle frontal gyrus: HC reported higher BDNF levels associated with greater GM volumes.

Conclusions: An increment of serum BDNF, representative of platelets contents, could probably be related to mood stabilizer effects on BDNF and with the duration of the illness. In fact, both the chronic assumption of mood stabilizer and a longer illness duration, seems to be related to an increment of BDNF serum levels and GM volumes. The presence of a neuroinflammatory state could induce an anti-inflammatory response to repair cell damage and support neuronal survival. However, the impact of BDNF in BD could potentially be different from that in healthy individuals because the pathophysiology of BD is associated with immune cells abnormalities and the disease process has deleterious effects on neurons and non-neuronal cells.

2. PSYCHOLOGICAL CORRECTION OF PSYCHOEMOTIONAL STATE IN WOMEN WITH PREGNANCY HYPERTENSIVE COMPLICATIONS

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Introduction/Objectives: Psychoemotional disorders in pregnant women represent a significant medical and social problem, as the consequences caused by this pathology have a strong effect on infants born to such mothers, and their mothers during and after pregnancy.

Often, the consequences caused by psycho-emotional disorders during pregnancy cannot be prevented using conventional pharmacological methods and standards, because the medication pregnant strictly limited because of their adverse effects on the fetus.

The purpose of psychological correction of emotional States in pregnant women with hypertensive syndrome Ericksonian method of hypnosis.

Participants, Materials/Methods: The study was conducted on the basis of fsbi "research center for obstetrics, gynecology and Perinatology named after academician V. I. Kulakov" Ministry of healthcare of the Russian Federation.

The study involved 150 pregnant women with hypertensive syndrome. 75 pregnant women with hypertensive syndrome received psychological correction method of Ericksonian hypnosis in the amount of 15 sessions.

To assess the psycho-emotional state the techniques used: depression scale Beck and the scale of anxiety Spielberg-Hanina (State Anxiety Inventory - STAI). The study was carried out 4 times in the first, second, third trimester and three months postpartum.

Results: When comparing psycho-emotional state of pregnant women with hypertensive syndrome on the background of psychological correction method Ericksonian hypnosis and pregnant women with hypertensive syndrome who did not receive psychological correction revealed statistically significant differences. In pregnant women with hypertensive syndrome, receiving psychological correction method Ericksonian hypnosis, revealed a lower level of depression and situational anxiety than women who did not receive psychological correction.

Conclusions: Thus, our study has proved the necessity of psychological correction method Ericksonian hypnosis and its effectiveness for stabilization of psychoemotional state of pregnant women with hypertensive syndrome and prevention of preeclampsia.

3. PROTECTIVE PSYCHOLOGICAL MECHANISMS AND COPING STRATEGIES OF PROSTATE CANCER PATIENTS

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Introduction/Objectives: Diagnostics of emotional disorders of patients with malignant diseases of the prostate is not doubt, because timely correction contributes to the shortening of rehabilitation period and restoration of the quality of life of patients after treatment. Detection and diagnosis of prostate cancer for many patients is stressful and causes changes in the affective sphere, and manifests itself in increased levels of anxiety and depression in men. Purpose of our research is studying psychological defense mechanisms and coping behavior of patients with prostate cancer.

Participants, Materials/Methods: The study included 56 men who applied to the Department of Clinical Hospital in the period from December 2009 to June 2014. The average age of the patients was $35,7 \pm 6,1$ years. The average duration of prostate cancer is $4,6 \pm 4,2$ g. All the men were subjected to standard algorithm evaluation of hormonal status, PSA and other method of instrumental diagnostic. Psychological study of patients was performed at the beginning of the treatment cycle, a urologist at the stage of diagnostic measures. **Methods:** Beck depression scale to identify depressive symptoms and assess their degree of severity; Scale of psychological stress PSM-25 to measure stress on somatic sensations, emotional and behavioral characteristics; technique "lifestyle index" to measure the severity of psychological defense mechanisms; technique "Coping - test" to determine the coping - mechanisms in the cognitive, emotional and behavioral areas; Scale reactive and personal anxiety for the differentiated assessment of anxiety as a state and anxiety as a personality traits.

Results: Thus, according to the results of research, prostate cancer patients were likely to use constructive coping- strategies that led to the stabilization of the mental and emotional state of men and contributed to a more effective adaptation under stress caused by the process of the treatment of prostate cancer. Negative correlation between this type of coping strategies and primitive psychological defense mechanisms, have shown that the active position occupied by the subject in relation to stressful events, reduced the level of emotional stress the most productive and adequate manner, which contributed to a successful adaptation.

Conclusions: As a result of our research we were obtained correlations between the mechanisms of coping and psychological defense mechanisms as an important component of psychological adaptation of this group of patients, analyzed the effectiveness of these strategies when coping with stress in the conditions the beginning of the program of treatment prostate cancer, examined indicators of mental and emotional state of patients.

4. PSYCHOTHERAPEUTIC TREATMENT OF PATIENTS SUFFERING FROM ANXIETY-DEPRESSIVE DISORDER AND RESIDUAL CEREBRAL-ORGANIC FAILURE.

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Introduction/Objectives: Residual cerebral-organic failure

forming pathologically changed "soil" ("ground") often leads to chronization and complication of neurotic disorders that are developing due to it. This failure is the factor which worsens patients' social adaptation and narrows therapeutic potentialities of correction. Developing anxiety-depressive disorders combining with evident asthenic, cephalgic and cognitive derangements are among the most common kinds of neurotic pathology that such patients suffer from.

Participants, Materials/Methods: The aim of this research is to study factors of increase in efficiency of psychotherapeutic treatment of patients suffering from anxiety depressive disorder and residual cerebral organic failure. In order to achieve our aim we paid special attention to developing a program of patients' self-help and self-regulation training. This thesis is based on the fact that emerging cognitive abnormalities combined with emotional lability create all the necessary conditions for the patient to deepen their inferiority feeling, to become unduly vulnerable and unable to adequately regulate their personal functioning. Inclination to constant comparison with former "ideal" state and resources led to acute sense of loss, "psychic disablement" and cognitive vulnerability with intensification of dysfunctional schemes.

Results: Our psychotherapeutic self-help program was based on cognitive-behavioral therapy methods, relaxation techniques and was carried out through group format. The program aims included increasing patients' independence, teaching them to take responsibility for their behavior and help, creating adequate and optimistic view of life, emotional and physical abilities.

The program consisted of teaching self-regulation (vegetative discomfort correction with help of autogenous training), self-correction of disadaptive cognitive constructions (working with automatic thoughts), sanogenic lifestyle (optimization of everyday schedule, labor, physical and mental activity, meal). The patients were motivated towards deeper socialization. Attempts were taken to make patients form a skill of turning for support and keeping negative emotions from those around one. The training also included normalization one's opinion about regular appointments at a neurologist, taking special medicine in order to correct and prevent relapse of general and organic pathology.

Conclusions: As a result we observed evident decrease in anxiety and depression levels, improvement of other psycho-clinical indicators among patients who had taken part in the psychotherapeutic groups' activity.

5. TOURETTE'S DISORDER, TREATMENT ALGORITHM

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Introduction/Objectives: Tourette's disorder (TD) is neurodevelopmental motor disorder and it is diagnosed when the individual has multiple motor and vocal tics that have been present for at least one year and that have a waxing-waning symptom course (DSM 5). The paper analyses the results of therapy and suggests an algorithm of treatment.

Participants, Materials/Methods: 21 minors with Tourette's disorder (between 8 and 16 years of age). 19 participants were male. 9 participants had comorbid disorders (5 participants had

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OCD and 4 participants ADHD). All were treated at outpatient unit of Children's Hospital Zagreb.

Results: The average age of starting treatment procedures was 12 years.

Among 21 patients, 8 patients were treated with neuroleptic drug (haloperidol or risperidone or pimozide) due to severe tics.

Haloperidol and risperidone were administered in 8 cases, and pimozide in two cases. During neuroleptic therapy the improvements (reduction of tics) lasted for only 2-6 weeks.

In 5 cases of TD without ADHD, clonidine was given as a single drug and its effects (reduction of tics) lasted during the medication but not more than two months.

In 4 cases, the combination of neuroleptics and clonidine proved to be better in reducing tics, but the sedative side effects were too strong.

Comorbid condition of OCD (5/21) in all cases responded well to the application of drugs (SSRIs or tricyclics), so patients felt better despite tics. All cases of TD with ADHD (4/21) have reacted well to the application of clonidine. Positive effects of drug therapy on OCD or ADHD lasted at least during the medication.

Concomitant use of the two drugs (neuroleptic and SSRI or tricyclic, neuroleptic and clonidine, clonidine and SSRI or tricyclic) reduced the elements of ADHD or OCD but reductions of tics were the same like during single neuroleptic drug use or better (neuroleptic and clonidine).

All patients (21/21) responded well to psychotherapy and social-therapy procedures.

Conclusions: Psychotherapeutic and social-therapeutic procedures were the main form of treatment which we applied in all patients with Tourette's disorder. Neuroleptic therapy showed short-term positive results in reducing tics. Drug therapy (SSRIs, tricyclics, clonidine) of comorbid disorders (OCD, ADHD) had a positive effect at least during the medication. The drug combinations increased the level of side effects of therapy. Most helpful interventions for the overall well-being of the patients were psychotherapy and social-therapy involving the patient, his family and the school.

6. THE EARLY ONSET OF MORPHOMETRIC ALTERATION IN HIPPOCAMPAL FORMATION DURING FIRST-PSYCHOTIC EPISODE

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Introduction/Objectives: Early brain structural alterations are present in subjects at high risk of developing psychosis. Studies suggest that there is an association between hippocampal (HPC) volume reduction and symptom severity in schizophrenia subjects after the first psychotic episode. Moreover, these alterations may further impede the treatment complexity of first psychotic break. We present three adolescent inpatient cases, each presenting with first episode of psychosis and significant alterations of their respective HPC formation.

Participants, Materials/Methods: Structured psychiatric interview, Neuroimaging study, EEG and routine lab testing,

Comprehensive battery of psychological testing including:

- Wechsler Intelligence Scale for Children – Fourth Edition
- Repeatable Battery for the Assessment of Neuropsychological Status
- Trails Making Test
- Personality Assessment Inventory – Adolescents
- Rorschach Inkblot Test

Cases:

Patient A is a 16 y/o M who presented with emotional and perceptual disturbances associated with general anxiety disorder and panic attacks.

Patient B is a 17 y/o F who presented with frank psychotic symptom, mood instability and catatonia. The clinical picture was further complicated by intermittent myoclonic seizure activity.

Patient C is a 17 y/o M who presented with frank paranoia, persecutory delusions, auditory and visual hallucinations, coupled with increasing unprovoked agitated behavior in the context of substance intoxication and extensive cannabis use.

Results: The MRI of the brain: Patient A findings showed a decreased right HPC volume; patient B was significant for decreased left hippocampus and increased bilateral HPC fissure, while patient C was consistent with bilateral prominence of HPC fissures (see figs).

The EEG Data: Patient A and B were normal, while patient C, showed polyspike wave discharges consistent with idiopathic generalized seizure.

Psychological Testing: showed borderline range cognitive functioning and physiological anxiety (Patient A); global deficits in cognitive functioning, poor reality testing and poor insight (Patient B) and low average cognitive functioning, poor reality testing and deficits in visual memory (See figs).

Intervention: All three patients were stabilized within a period of 3-6 weeks. Their symptoms were controlled with atypical antipsychotics mainly or long-acting antipsychotics. However, the initial management also included benzodiazepines which were eventually tapered mainly for panic attacks (patient A), catatonia and seizures (patient B) and psychotic agitation (patient C). All three patients were discharged with follow-up to the outpatient treatment service.

Conclusions: Numerous studies have demonstrated the functional implication of the early morphometric HPC changes in patients after their first-psychotic episode. Our clinical case presentations and HPC alteration findings are consistent with the hypothesis that psychotic events in schizophrenia are associated with an early disruption/arrest of normal neurodevelopment, which likely implicates alteration of gray matter in other brain areas including HPC, amygdala and prefrontal cortex. Moreover, these findings have important implications for future neurobiological studies of psychotic disorders and emphasize the importance of longitudinal studies examining patients before and after the onset of a psychotic episode.

7. USE OF NEW PSYCHOACTIVE SUBSTANCES IN PATIENTS WITH CHRONIC PSYCHOTIC DISORDER – CLINICAL CONSIDERATIONS

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Introduction/Objectives: As an increasing number of new psychoactive substances (NPS) have become available among the users worldwide in recent years, a corresponding increase in use of these substances among patients with psychotic disorders ("dual diagnosis patients") can be observed. While acute symptoms of abuse are predominantly short term, the long term consequences are yet to be evaluated. Identification of NPS, where the "gold-standard" is gas chromatography with mass spectrometry, is still problematic due to its cost and problems with NPS detection because of their chemical diversity, their short half-life, and the continual emergence of new substances.

Participants, Materials/Methods: All admitted patients with psychotic disorder were routinely interviewed for current and past use of substances. Standard urine and alcohol testing was performed. In certain individuals showing significant signs of intoxication, gas chromatography with mass spectrometry for NPS was performed.

Results: It was established that the majority of patients with anamnesis of NPS use where gas chromatography with mass spectrometry was performed and NPS was identified, were also conventional psychoactive substance (THC and alcohol) users. Certain patients were unaware of what NPS they were taking.

Conclusions: In patients with psychosis and sudden emergence of unexplained, mostly atypical clinical picture of a psychosis, health care professionals should consider the possibility of NPS abuse. As it is also important to analytically confirm the exact compounds causing the intoxication to foster an understanding of the influence of different NPS on the long term consequences in psychotic disorders. We think it is necessary to include information about NPS in the education of patients, because of potential hazardous side effects as well as currently unexplained long-term effects on the prognosis of the disorder.

8. DEFINITION OF TYPES OF PERSONALITY DISORDERS IN PATIENTS WITH ALCOHOL ADDICTION

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Introduction/Objectives: Our aim was to study the structure of psychopathology and to identify the main types of personality disorders in patients with alcohol addiction.

Participants, Materials/Methods: 60 patients with alcohol addiction participated in the study. The average duration of alcohol addiction was 5.4 years. Clinical, psychopathological and statistical methods were used. In order to identify the types of personality disorders, participants were examined with a technique described by J. Oldham and L. Morris. Behavioral motives and emotional-

volitional spheres were investigated with multifactorial experiment developed by R.B. Cattell.

Results: 31 patients (52%) displayed paranoid sharpening of personal character traits. 12 patients (20%) demonstrated aggressive traits. Anxious and avoiding behavior and character traits were found in 7 patients (12%). Finally, 10 patients (16%) exhibited symptoms of emotionally unstable personality.

Conclusions: We have determined 4 main types of personality disorders in patients with alcohol addiction: paranoid, aggressive, anxious and emotionally unstable. Pathological changes of personal character traits in patients with alcohol addiction originate from the chronic toxic damage of neural system. Initially, personal disorders are characterized by the slight sharpening of outstanding traits, but further, these sharpening transforms into full-fledged personality disorder with loss of cognitive personal resources. Further toxic damage of brain tissue leads to further worsening of personality disorder. At final stages of the disease, alcohol-induced personality disorder resembles personality disorders observed in organic brain diseases. We have determined 4 main types of personality disorders in patients with alcohol addiction: paranoid, aggressive, anxious and emotionally unstable.

9. DEPRESSION OR MULTIPLE SCLEROSIS, WHAT STARTED FIRST?

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Introduction/Objectives: It is known that multiple sclerosis is accompanied by depression. Depression may be effected by the changes caused by MS and appear as undesired effects of treatment with corticosteroids or interferon. However, depressive symptoms are one of the most common symptoms of multiple sclerosis. Likewise, the depression is present in other immunological, neuroinflammatory diseases suggesting that inflammation alone contributes to the development of depression in these conditions. Untreated depression reduces the quality of life of people with MS, leading to increased feelings of fatigue, all the more intense pain and more pronounced cognitive failure and can be life threatening. Studies have shown that the risk of suicide affected by MS is 7.5 times higher than in general population.

Participants, Materials/Methods: In our work we show patient whom we treated psychiatric stationary due to the depression presented with cognitive impairment and distinctly pronounced suicidal risk. During treatment we conducted neuropsychological tests and neuroradiological imaging and processing of CSF and serum of patient by which we diagnosed primary demyelinating disease of the CNS, MS.

Results: Through a well-organized consultation activities and extremely close cooperation of team made of psychiatrists, neurologists, psychologist, radiologist and infectious diseases we quickly diagnosed and carried out intensive complementary treatment of our patient in the psychiatric ward.

Conclusions: Clinical depression affects up to 50 % of patients with MS throughout their life, it is associated with increased morbidity and mortality, and is one of the main indicators of the

quality of life of these patients. In neurological surrounding depression is often inadequately treated due to which it is very important in the medical team and consultation to include a liaison psychiatrist and a psychologist as well.

10. MODERATING EFFECTS OF DEPRESSIVE SYMPTOMS ON THE RELATIONSHIP.

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Introduction/Objectives: Problematic internet use (PIU; Internet addiction, Internet dependence, pathological internet use) is characterized by an individual's inability to control their internet use, leading to marked distress and/or functional impairment. PIU occurs in approximately 10%–30% of adolescents; adolescence is characterized as a period of rapid and sudden physical and mental development. Therefore, adolescent internet use has the potential to significantly impact physical and mental health due to the distinct characteristics of adolescent development. Adolescent PIU is highly associated with depression and sleep problems. However, whether or not a direct relationship exists between PIU and sleep problems or whether depressive symptoms play a moderating role between the two is unclear. We hypothesized that 1) an adolescent group with problematic internet use (PIUG) would have more sleep problems (e.g., insomnia, excessive day time sleepiness, and sleep-wake behavior problems) compared with an adolescent group with normal internet use (NIUG); and 2) depressive symptoms would moderate the relationship between PIU. To verify this hypothesis, we examined various variables related to PIU, depressive symptoms and sleep problems and their interrelationships.

Participants, Materials/Methods: A total of 802 students between 7th and 11th grade (age range: 12–17 years old) were recruited from one middle school and one senior high school that were located in Seoul, South Korea. Of the 802 students who participated in the study, 36 were excluded due to incomplete responses, which resulted in 766 subjects (483 boys, 283 girls). Measures: 1. Young's Diagnostic Questionnaire (YDQ), 2. The School Sleep Habits Survey (SSS): includes 1) a Sleepiness Scale, 2) a Sleep-Wake Behavior Problems Scale (SSS_SWBP), 3) a Depressed Mood Scale (SSS_DM) and 4) a Morningness-Eveningness (M-E) scale, Epworth Sleepiness Scale (ESS), 3. Insomnia Severity Index (ISI), 4. The Children's Depression Inventory (CDI)
We used Baron and Kenny's method to examine the moderating or mediating effects between the independent and dependent variables.

Results: Among the total of 766 participants who completed the questionnaires, 152 had PIU. The PIUG had significantly higher ISI, ESS, SSS-S and SSS_SWBP scores compared with the NIUG. The mean bedtime of the PIUG was significantly later than that of the NIUG, both on weekdays and weekends. Additionally, the PIUG had significantly higher depressive symptoms compared

with the NIUG.

We examined the moderating effect of depressive symptoms on sleep-related problems with PIU using the Baron and Kenny method. PIU itself did not affect the ISI or M-E. However, when depressive symptoms were combined with PIU, PIU had an effect on the ISI and M-E, suggesting that depressive symptoms moderated the interaction between PIU and ISI or M-E. Regarding the ESS, we found that when PIU and depressive symptoms were combined, each of them affected ESS, indicating that PIU and depressive symptoms have reciprocal moderating effects.

Conclusions: Both depression and PIU, as well as their interaction, can contribute to various sleep problems. Because sleep is essential for mental and physical development and daily functioning in adolescents, young people need adequate sleep time and sleep quality.

Understanding the underlying causes of adolescent sleep problems is critical for solving them. However, the cause of sleep problems in adolescents is not simple. Adolescent sleep problems may arise from the interactions of various factors such as PIU, depression and normal physical and hormonal changes. Therefore, the causes will need to be explored in a more multi-dimensional way with the collaboration of experts in related areas.

11. PREVALENCE OF FOOD ADDICTION AMONG OVERWEIGHT PEOPLE IN THE SPORT MILITARY BRANCH IN AL-AMARAT IN JUNE 2014 .

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Introduction/Objectives: Background: Food Addiction refers to a behavioral phenotype of food consumption that mirrors the clinical criteria for substance dependence. This is a process similar to drug addiction: the food triggers the reward center of the brain, causing a sense of pleasure. But with frequent consumption of such foods, they become physically and emotionally addicted. Due to lack of studies on FA; the extent of the problem in Sudan especially in Khartoum is unknown.

General Objective: The aim of this study was to determine the prevalence food addiction among overweight people in the sports military branch training center of Al-Amarat in June 2014. Specific objectives:

1. To determine the symptoms of tolerance in the addicted individuals.
2. To determine the withdrawal symptoms in the addicted individuals.
3. To determine the desire of quitting some sorts of food in the addicted individuals and failing in that.
4. To determine the loss of self control in food habits in the addicted individuals.
5. To determine the salience among addicted individuals.
6. To estimate the effects of food addiction on the social life and productivity of the addicted individuals.
7. To determine the negative psychological effects on the addicted individuals

Participants, Materials/Methods: This was a descriptive cross-sectional. A 27-item 200 self-administered questionnaire was

distributed conveniently to overweight individuals in the training center of Al-Amarat. Its the largest training centre in Al-Amarat Of the 200 questionnaires, all of them were completed. The response rate was 100% .There was no association between the prevalence of FA and Gender (pvalue= 0.89). The questionnaire was standardized and published by Yale University in the united states and it was translated from english to arabic and back to english and again to arabic by three different persons to make sure of its validity.

-Inclusion criteria:The overweight people whose Body Mass Index is ranging between (25_30) aging between (18_50) including the same number of males and females .

-Exclusion Criteria:Will be Excluded from the sample all the Individuals who reported DSM-IV binge eating or compensatory behaviors (eg, vomiting for weight control), use of psychotropic medications or illicit drugs over the past 3 months. And also all those who have a medical illness that caused them the obesity.

Data management and analysis plan: The data generated on the questionnaires will be numbered and validated manually for errors and entered for analysis using SPSS. Data analysis will be carried out using SPSS software package on the computer. Simple descriptive statistics: frequencies, means, and percentages will be used to describe the study findings. The YFAS provides 2 scoring options: a symptom count version and a diagnostic version. To receive a“diagnosis” of FA, it is necessary to report experiencing 3 or more symptoms in the past year and clinically significant impairment or distress. The participants who indicated that they had never experienced the symptom were assigned a value of zero.Chi square analysis will be performed to test the relationships between food addiction and the information variables .

Results: 200 questionnaires were analyzed. The prevalence for Food Addiction among both males and females was 52%. The prevalence for Food Addiction among the females was 60%. The prevalence for Food Addiction among the males was 48%.

Conclusions: The majority of the overweight people in the training centre of Al-Amarat had Food Addiction according to the criteria of Yale Food Addiction Scale. Food Addiction needs more studies to be well identified so, actions can be taken to solve this problem. This study has revealed for the first time that:

- 1) slightly more than half of overweight individuals in the training center in Al-Amarat were food addicted.
- 2) food addiction has slightly higher rates in females than in males, and it equaled approximately half of the participants.
- 3) ‘food addiction’ contributes to human obesity and is significantly associated with the severity of obesity/amount of body fat from normal to obese individuals in the general population. Our findings provide strong evidence that ‘food addiction’ may represent a distinct etiology of human obesity in the general population.

The FA doesn’t depend on neither the gender, age, occupation, education, nor the marital status of participants. But, it depends on family history of obesity incidence .

Food addiction diagnoses are positively associated with BMI and, therefore, increased in obese individuals and even more in obese patients with BED. Moreover, this relationship between body mass and food addiction may be non-linear. Studies suggest that there is a plateau in food addiction symptomatology once an obese state is reached. However, prevalence rates show that the obesity epidemic cannot be fully attributed to addictive eating notably that an

arguably high proportion of under-, normal-, or overweight individuals can also be classified as food addicted...

12. HEADACHE ATTRIBUTED TO PSYCHIATRIC DISORDER – CASE REPORT.

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Introduction/Objectives: Contrary to numerous studies showing a high degree of comorbidity between psychiatric disorders and primary headache disorders, pointing to psychiatric disorder as a risk factor for headache progression and chronification, the number of studies that put in the spotlight headache occurring only during the psychiatric disturbance, e.g. “headache attributed to psychiatric disorder” is significantly smaller. Literature data, limited to case reports and one retrospective study, point out headache attributed to psychiatric disorders as an uncommon headache syndrome with wide area of clinical presentation, differential diagnosis, clinical implications and needs for future research.

Participants, Materials/Methods: Hereby, we present patient with headache attributed to psychiatric disorder.

Case report: Male patient, 23 years old, complains on severe pain, localized in the whole body, the most pronounced in head. The first symptoms he experienced at the age of 17, when he started to feel pain in the whole body and believed that he had been suffering from serious and incurable disease. Looking for a cause of the illness he underwent extensive diagnostic procedures. In the further course of the disease, symptoms remain and progress, resulting in social withdrawal up to isolation and complete dysfunctionality. Headache that he complains of is continuous, without headache-free periods, diffuse, with the pain localized in the whole head. The intensity of pain is 10 on verbal analog scale (VAS), showing no aggravation by routine physical activity, without photophobia and phonophobia, refractory to analgesics. At times, unrelated to the severity of pain, he has nausea without vomiting.

Neurological examination and neuroimaging showed normal results.

During the six years lasting period, the therapeutic attempts with olanzapine, risperidone, haloperidole, amitriptyline, paroxetine, clomipramine, carbamazepine and valproic acid resulted with unsatisfactory effect.

Conclusions: Treatment with clozapine brought about significant improvement in mental state. Simultaneously, the headache improved as well, with the reduction of intensity to the 4 on VAS. In this way, the evidence of causation, required by the International Classification of Headache Disorders as a diagnostic criteria for the „headache attributed to psychiatric disorder“ had been demonstrated.

13. KYNURENINE PATHWAY AND WHITE MATTER MICROSTRUCTURE IN BIPOLAR DISORDER

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Introduction/Objectives: Decreased availability of serotonin in the central nervous system has been suggested to be a central factor in the pathogenesis of depression. Activation of indoleamine 2–3 dioxygenase following a pro-inflammatory state could reduce the amount of tryptophan converted to serotonin and increase the production of tryptophan catabolites such as kynurenic acid, an antagonist of ionotropic excitatory amino acid receptors, whose levels are reduced in bipolar disorder (BD). Changes in white matter (WM) integrity have been suggested as a biomarker for BD. We then hypothesized that metabolites involved in serotonergic turnover in BD could influence DTI measures of WM microstructure.

Participants, Materials/Methods: Peripheral levels of Tryptophan, kynurenine, kynurenic acid, into 3–hydroxy-kynurenine, and 5-HIAA were analysed in 22 patients affected by BD and 15 healthy controls. WM microstructure was evaluated using Diffusion Tensor Imaging and tract-based spatial statistics with threshold free cluster enhancement only in bipolar patients.

Results: We observed that kynurenic acid and 5-HIAA were reduced in BD and associated with DTI measures of WM integrity in several association fibres: inferior and superior longitudinal fasciculus, cingulum bundle, corpus callosum, uncus, anterior thalamic radiation and corona radiata

Conclusions: Our results seem to suggest that higher levels of 5-HIAA, a measure of serotonin levels, and higher levels of Kynurenic Acid, which protect from glutamate excitotoxicity, could exert a protective effect on WM microstructure. Reduced levels of these metabolites in BD thus seem to confirm a crucial role for serotonin turnover in BD pathophysiology.

14. BIZZARE CONSEQUENCES OF ENCEPHALITIS

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Introduction/Objectives: The core of the encephalitis syndrome consists of an acute febrile illness with evidence of meningeal involvement, added to which are various combinations of the various symptoms and signs. As a result of viral encephalitis can damage the structure of the brain that cause disturbances of higher cortical activity, disorders of character and instincts, and possible neurological deficits.

Participants, Materials/Methods: The aim of this paper is to show that the patient who has been recovered of viral encephalitis without neurological, but with psychological consequences.

Results: 56 years old female patient, married, retired, treated 17 years ago due to acute viral encephalitis when fully recovered

physically. Then psychological changes occurred in the form of memory impairment, emotional instability and behavioral changes. After 4 years begins occasionally aimless and pointless wandering, which can last for several days. Every time she left home she was aware of her actions, she remembered everything, but she did not know the purpose of her pointless walking around. With the help of psychopharmacotherapy all mental disorders were significantly improved (memory, behavior and mood) except the insistent needs for periodic wanderings that remained inaccessible drug correction after 13 years of treatment.

Conclusions: In spite of the prognosis of postinfectious psychosyndromes are generally poor, in our patient was an improvement of all psychological problems, except persistent and urgent needs for bizarre aimless wandering (3-5 times a month).

15. NEUROPSYCHOANALYSIS IN PHILOSOPHICAL CONTEXT

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Introduction/Objectives: Sigmund Freud (1856 – 1939) can also be called the father of neuropsychanalysis. He based his first ideas on psychoanalytic approach on the hypnotherapeutic studies of hysteria. Of no less importance are his later works on connection with the philosophical contexts and characteristics. His life work is recognised and appreciated by various world's important philosophers for dealing with philosophical matters. Freud's contributions to philosophical issues is not without value and cannot be ignored.

Participants, Materials/Methods: Various philosophical and scientific papers in which Freud's involvement in contemporary philosophical thought is elaborated. The authors have used as the method of their work consulting, discussing and analysing due to connect Freud's approach with other philosophical works. They comment, work through and give their own summary interpretations of these issues within today's mainstream philosophy.

Results: Sigmund Freud's philosophical thought is an important part of today's philosophy and other textbooks. Freud had numerous followers in this field, and they have elaborated and enlarged on his primary ideas. Later investigation and philosophical research, especially the successful part of neuroscience, has ramified Freud's primary ideas in this district of psychology and philosophy, psycholinguistics, (neuro)psychoanalysis, phenomenology, hermeneutics, ontology, epistemology and (post)structuralism. Freud's work is a paradigm of combining different disciplines – natural and social sciences, for the enrichment of neurology, neuroscience and medicine in general.

Thus the philosophers received new specific knowledge and insight in their own matter of investigation. Thus were opened new horizons and possibilities of a wide range of discussion about further research in science, especially between all possible included data, disciplinary fields presented, and that in the multi-perspective and various modes of philosophical mainstream.

Conclusions: Achieved results in the exciting area of

neuropsychanalysis promise new findings which will cause the necessary echo in their wide philosophical sphere. Philosophy is a discipline with multi and inter-disciplinary fields, which source their hypotheses from all the sciences and make their own findings and final conclusions, as has been through the millennia. Neuropsychanalysis encourages philosophy and vice versa, et ad hoc et eo ipso et verbatim et de rerum naturae. Philosophy could enrich neuropsychanalysis by its new findings.

16. C(- 1019)G 5-HT1A PROMOTER POLYMORPHISM AFFECTS FRONTO-LIMBIC CONNECTIVITY DURING EMOTIONAL PROCESSING IN BIPOLAR DEPRESSION

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Introduction/Objectives: The 5-hydroxytryptamine 1A (5-HT1A) receptor is an inhibitory G protein-coupled receptor and a functional variation (C[-1019]G) in 5-HT1A receptor gene polymorphism (rs6295) influences the serotonergic neurotransmission: the G variant was associated with higher expression of 5-HT1A and reduced serotonergic signaling. It is known that rs6295 affects antidepressant response, risk of developing a major depressive episode and committing suicide, with a detrimental role for the G variant. Different studies showed that rs6295 influences amygdala (Amy) reactivity to emotional stimuli: in depressed patients, the G allele was associated with greater reactivity. The same pattern was found in Panic Disorder, paralleled by a decreased activation of prefrontal cortex. The aim of this study is to explore how rs6295 and emotional processing interact in affecting the connectivity between Amy and prefrontal cortex in bipolar depression.

Participants, Materials/Methods: We used fMRI and a Functional Connectivity analysis (CONN toolbox) to study the effect of rs6295 on the response to emotional faces in 45 BD patients, divided into 8 CC patients, 25 CG and 12 GG. Seed-based analyses were performed by comparing the temporal bivariate correlation between the BOLD signals from bilateral Amy to all other voxels in the brain between genotypes and, as within effect, the difference between the processing of emotional faces and the control condition of the task. Imipramine equivalent dose for antidepressant treatment was entered as nuisance covariate. Z-score standardizing was introduced to validate the multiple comparisons (thresholded at cluster-size pFDR)

Results: A significant interaction between rs6295 and within effect of the task was found for the connection between right ventrolateral prefrontal cortex (VLPFC) with bilateral Amy (right Amy: $F=11.49$; left Amy: $F=12.30$). Specifically, for right Amy GG patients showed a significant increased connectivity compared to both CC and CG, for left Amy only compared to CC. For bilateral Amy in CG and GG patients the connectivity was significantly affected by emotional processing and different among the tasks ($p<.05$) neither of these effects were found in CC.

Conclusions: Rs6295 and emotional processing interact in affecting Amy-VLPFC functional connectivity in BD patients. Specifically, we found that GG patients showed a significant

increased connectivity between bilateral Amy and VLPFC compared to other two groups. In the light of the worse antidepressant recovery and clinical outcome previously detected in GG patients, our results could underlie to an enhanced Amy activation and a dysfunctional recruitment of VLPFC, followed by an unstable reactivity of the limbic areas to environmental stimuli.

17. DREAMS IN THE PSYCHOTHERAPY OF A TRAUMATIZED REFUGEE

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Introduction/Objectives: Dreams are a universal phenomenon. The material includes recent experiences, significant events, phantastic elements and sudden shifts in story line.

Today, there is scientific proof for the significance of dreams in working through emotional and stressful life situations. Traumatic events are followed by a typical pattern of dreams, changing with time. However, cultural views can differ and present rigid prescribed roles of the dream content.

Can dreams be used in a meaningful way in psychotherapy regardless of differences in cultural views of dreams and their meanings?

Participants, Materials/Methods: Case study with a male psychotherapy 44-year old refugee patient suffering of nightmares, with a history of multiple traumatic events.

Results: In a culturally sensitive integrative psychotherapy dreams were interpreted with respect for cultural meanings. The dream work made a mutual exploration of the trauma history possible and helped insightful processing of the patients' experiences.

Conclusions: Dream work can be a significant additional tool transculturally if the patients' cultural views are respected.

18. A COMPARATIVE STUDY OF THE NATURE AND EXTENT OF COVERAGE OF MENTAL HEALTH ISSUES IN INDIA AND THE U.S.

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Introduction/Objectives: •Media are considered to be the public's primary source of information regarding mental health. Mass media representations of people with psychiatric disorders tend to emphasize violence, dangerousness and criminality. Even in the current era of global internet, print media still present a powerful channel through which information can be transferred to the society

We aimed to compare the extent and nature of coverage of mental health issues in THE TIMES OF INDIA, the most widely read English language daily in India, and THE NEW YORK TIMES, one of the most widely read newspapers in the U.S., based on an electronic search of appropriate keyword/s.

Participants, Materials/Methods: We searched for "mental illness" as key words. The electronic search was carried out in one leading English language daily newspaper each, published from

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India and the United States. The electronic search was conducted over a six month period from May 1, 2015 to October 31, 2015. Content analysis was done on the articles searched, by a team of two psychiatrists.

Results: Of the total number of electronic search results, 90.3 % belonged to the New York Times which indicates significantly more extensive coverage of mental health issues. 72.9 % of the news items reported in the New York Times were adjudged to have a negative impact on the readers. In contrast, The Times of India carried 54% of the news items which had a positive impact on the readers. 75.5% of the search results of the TOI consisted of news items. There was no editorial comment related to mental health issues. The majority of the coverage in the NYT consisted of news items (60.9%) but it also carried editorial comments, which formed 8.5% of the search results. Both the newspapers carried majority of the news without quoting the perspective of a mental health professional (80.6% versus 66% respectively). Significant majority of the coverage in the NYT consisted of violence committed by the mentally ill persons while significant majority of the coverage in the TOI consisted of violence committed against the mentally ill patients. Editorial comments, which formed 8.5% of the search results.

Conclusions: We hope to sensitize both the print media as well as mental health professionals to the nature of coverage of issues related to mental health. This could form the basis of a new relationship between the two which is more open, frequent and objective. There is an eminent need to start organized activities like joint education workshops for journalists and mental health professionals in order to reshape the negative stereotypes of the mentally ill patients. We suggest that the journalists and other media related professionals should work on more comprehensive depictions of persons with mental illness reflecting a more accurate reality of their lives.

19. NEUROIMAGING MEETS PSYCHOANALYTICAL IMAGING

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Introduction/Objectives: Sigmund Freud, the father of psychoanalysis, came up with most of his revolutionary ideas about the human mind in the late 19th and early 20th century. Almost a hundred years later, neuroscience has progressed immensely, and techniques such as fMRI enabled us to document the action of neural networks and correlate them with external inputs, as well as anatomy. An engaging new moment for psychoanalysis arises with fMRI research of Freud's concept of unconscious, which was the central topic in his description of the working of the mind. Combined with a new prefix, neuropsychanalysis combines latest neuroscientific imaging-driven findings with original Freudian theories. Consequently, this approach has yielded scientific research that tackle the problem of understanding brain functioning, i.e. human behavior. Tools for scientific research of the brain in real-time didn't exist until recently, so neuroscience finally doesn't have to be afraid of Freud anymore.

Participants, Materials/Methods: Medical database PubMed was

searched for terms 'neuropsychanalysis' and 'neuroscience AND psychoanalysis'. Articles generated by search results were read and final conclusions for assessing validity of Freudian ideas through the eyes of current neuroscientific methods were derived according to published works.

Results: There are substantial fMRI studies that show correlations with Freud's theoretical postulates in which psychoanalysis managed to exist for a century. The modern concepts of 'default-mode network' in fMRI correlate with the psychoanalytical term 'Ego'. 'Free energy' can account for what is known in neuroscience as prediction-error in neural network interactions. The hierarchy of Freudian topographic model can be correlated with neuroanatomical structures that exert top-down regulation in order to lower the rate of prediction-error. When dysfunctional neural network patterns occur in distinct brain regions, along with the loss of higher cortical control, i.e. top-down control, certain disturbances in psychological functioning arise.

Conclusions: Contemporary neuroscience has the means to scientifically assess Freudian ideas after a century of existence of psychoanalytical practice across the world. With studies and observations done by fMRI technique, a lot of Freud's original concepts can be supported by scientific evidence. Since he came from a medical background and invested significant effort in trying to link the anatomy of the brain with the functioning of the mind, it isn't surprising that his intuition did provide modern neuroscience a solid theoretical system that should be investigated and certainly not neglected if proven correct.

20. SUCCESSFUL TREATMENT OF SEVERE TREATMENT-RESISTANT TOURETTE SYNDROME WITH CANNABIS

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Introduction/Objectives: Tourette Syndrome (TS) can be a disabling condition with severe psychosocial handicap. Current treatments are often ineffective or intolerable. Literature suggests that some sufferers successfully self-medicate with cannabis and there is evidence that delta-9-tetrahydrocannabinol (THC) can be effective. We report on the first case of TS being successfully treated with 'Sativex', a medicinal cannabis treatment from cannabis Sativa containing cannabidiol and THC in a 1:1 ratio, measured by subjective questionnaires and objective video assessments.

Participants, Materials/Methods: Our subject is a 26 year old man who has for the last fourteen years suffered from severe treatment resistant TS. Our subject was videotaped on four occasions for thirty minutes at a time; the first ten minutes completing maths problems followed by ten minutes reading aloud from prose and then ten minutes sitting in silence. The first video was prior to commencing treatment, then he was filmed at week one, week two and one month during treatment whilst adherent to Sativex. His TS was subjectively assessed using the Yale Global Tic Severity Scale (YGTSS) and objectively using the Original Rush Videotape Rating Scale (ORVRS). Two raters watched the

videos independently and were blind to the phase of treatment being assessed.

Results: Administration of Sativex improved motor and vocal tic frequency and severity significantly. Video assessments showed a reduction in motor tics from 176 pre-treatment to 27 at week four and vocal tics from 20 pre-treatment to 2 at week four. The severity score of his tics reduced from 9/10 to 2/10 on the ORVRS with the number of body areas affected reducing from 11 to 2. The subject's YGTSS reduced from 71/100 pre-treatment to 46/100 at week four. Inter-rater reliability was good.

Conclusions: Our results support previous research suggesting that cannabinoids provide a safe and effective treatment for TS and should be considered when first-line therapies have been unsuccessful.

21. COMPARATIVE EFFICACY OF SOME TYPICAL AND ATYPICAL ANTIPSYCHOTICS IN THE TREATMENT OF SCHIZOPHRENIA

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Introduction/Objectives: Schizophrenia is a severe and devastating mental disorder. Antipsychotics are regarded as its main treatment strategy for the last 60 years. The clinical profile and side effects of particular antipsychotics (AP) can vary considerably.

Participants, Materials/Methods: This study was devoted to the comparison of the efficacy and side effects of some typical antipsychotics (TAP) and atypical antipsychotics (AAP). Patients with paranoid schizophrenia were treated by the either TAP (1 group, n=145) or AAP (2 group, n= 95). The influence of AP on cognitive functioning and negative symptoms of schizophrenia has also been assessed. PANSS and some neurocognitive scales (test of fluency, verbal memory test, complex figure of Ray-Osterica, Wisconsin card sorting test, test of variables of attention) were the main instruments. The patients of the first group were taking perphenazine (n=51) or zyclophenthixol (n=69). The second group patients were treated by either risperidon (n=53) or quetiapine (n=42).

Results: The global efficacy of the TAP and AAP has not differed significantly from each other (18.0% and 12.6%, respectively). The clinical profile of negative symptoms was associated with the specific course of schizophrenia and a particular AP used. The severity of negative symptoms due to psychotic signs has been reduced more intensively while using TAP than AAP from the fourth to the eighth week of treatment. After that, it may also last gradually even after achieving the remission. Moreover, the severity of negative symptoms may also depend on the course of disease regardless the particular AP used: the more favorable course, the less severe negative symptoms occurred.

Conclusions: All antipsychotics have improved the different domains of cognitive functioning after reducing of psychotic features. In adding to that, the improvement of cognitive functions may continue up to six months after remission. On the other hand, only the parameters of visual and aural memory are more likely to

reach the normal ranges, but not other cognitive domains which could be decreasing a lot after clinical remission.

Both groups with a favorable course of the disease were characterized by the less severe profile of negative symptoms in comparison with patients with the most severe course regardless the particular AP used. It must be emphasized that after achieving remission and during the maintenance phase of pharmacotherapy the differences between two groups were not too large and were more likely to depend on the course of schizophrenia.

22. RECOGNITION AND DISCRIMINATION OF FACIAL EMOTION EXPRESSION IN CHILDREN WITH ATTENTION-DEFICIT HYPERACTIVITY DISORDER AND AUTISM SPECTRUM DISORDER

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Introduction/Objectives: Impairment in facial emotion recognition and facial emotion discrimination is established findings in autism spectrum disorders(ASD). And children with attention-deficit hyperactivity disorder (ADHD) also experience significant difficulty in recognizing and discriminating facial emotion. this study aimed to investigate the differences in facial emotion recognition and emotion discrimination between children with ADHD and ASD children.

Participants, Materials/Methods: 53 children, aged 7 to 11 years participated in this study. Among them, 42 children were diagnosed with ADHD and 11 children were diagnosed with ASD. We examined the ability to recognize facial emotion expression by using Penn Emotion Recognition Task (ER40) and we measured ability to discriminate facial emotional intensity by using Penn Emotion Discrimination Task(EDF40).

Results: ADHD children were found to have better ability than ASD children in the recognition of happy and sad faces, but there was no significant difference in the recognition of angry, fear, and no emotion faces between two groups. Also, ADHD children recognized facial emotion expression better than ASD children when they shown female faces, but We found no significant difference between two groups when they shown male face. And ADHD children showed better ability than ASD children in the recognition of intense emotion expression but there was no significant difference in the recognition of mild emotional expression between two groups. We found no statistically significant difference in the discrimination of facial emotional intensity between the children with ADHD and ASD children.

Conclusions: The results of our study suggested that children with ADHD have better ability in facial emotion recognition than children with ASD, yet have deficit in facial emotional intensity discrimination equal to children with ASD.

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23. DISSECTING LESION OF COMMON CAROTID ARTERY AFTER CAROTID SURGERY OF KINKING OF INTERNAL CAROTID ARTERY

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Introduction/Objectives: Carotid surgery is commonly performed in patients with symptomatic high grade carotid stenosis. In selected cases carotid surgery might be performed in other indications such as kinking of internal carotid artery which produce symptoms. The aim of this case report is to show rare complication of carotid surgery, and the role of endovascular treatment.

Case report: We herein report a case of 55 year-old female patient in whom carotid surgery was performed due to kinking of right internal carotid artery, what was confirmed with digital subtraction angiography of the neck. Patient complained on the pain of palpable pulsating mass on right side of the neck. Her prior medical history included low back pain and gastritis. Six months prior surgery in patient was performed microssectomy for cervical radiculopathy (C5-C6). The reduction of elongation surgery was performed due to kinking of right internal carotid artery. The resection of right internal carotid artery was performed with re-anastomosis with common carotid artery. The patient did not complained for symptoms after surgery. According to Hospital's protocol on 7th day control carotid ultrasound was performed. The carotid ultrasound showed dissection lesion of right common carotid artery with double flaps and moderate hemodynamic stenosis (60%), what was confirmed with computed tomography angiography of neck vessels. The detection of embolic signals with transcranial doppler showed 15 embolic signals in left middle cerebral artery. The neurological and physical status was normal. For stroke prevention dual antiplatelet and antihypertensive therapy were introduced. One month later the percutaneous angioplasty was performed with stent implantation. The control carotid ultrasound showed stent implantation with normal hemodynamics.

Conclusions: The carotid surgery complications such as dissecting lesion might be successfully treated with percutaneous angioplasty with stent implantation. Carotid ultrasound has its place as a screening method for finding of these unaware dissecting lesions.

24. HELICOBACTER PYLORI AND MULTIPLE SCLEROSIS

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Introduction: Recent studies pointing out the presence of *Helicobacter pylori* (HP) in multiple sclerosis (MS) patients implicate it's possible immunomodulating properties. However, there are still lot of contradictory and differences in epidemiological and serological data.

The aim of this study was to evaluate presence of *Helicobacter pylori* in MS patients; and impact of intravenous „booster“ steroid therapy on presence of *Helicobacter pylori*.

Participants, Materials/Methods: In this prospective study consecutively were analyzed 100 patients with MS treated at Department of Neurology, University Clinical Center Tuzla. The average age 81tatis patients was 37.34±9.2 (12-57) and 76% of them were women. Steroid free were 62 patients. Control group was made 81tatis same number of individuals free of neurological or gastro-intestinal diseases with average age of 37.5±10.25 (17-58) and 69% of them were women. ELISA-test was performed for analysis IgA, IgG and IgM anti HP antibodies blood. For statistical analysis were used standard tests: Ch2, proportion test and Fisher's exact test.

Results: Seropositive were 75 (75%) out of 100 MS patients, significantly more than in healthy group (38; 38%) (P<0.0001). In 38 patients who received at least once iv. Steroids HP was presented in 10, as well as in 15 patients out of 62 who did not receive iv. Steroids at all but this is not 81tatically significant.

Conclusion: *Helicobacter pylori* is significantly more frequent in patient with multiple sclerosis than in healthy population. Intravenous „booster“ steroids do not have impact on presence of *Helicobacter pylori* in patients with multiple sclerosis.

25. POLYMORPHISM OF THE OSTEOPONTIN GENE AND CLINICAL COURSE OF MS IN THE POLISH POPULATION.

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Introduction/Objectives: Osteopontin (OPN) is a key cytokine involved in T-cell activation in MS. We investigated whether polymorphism of the osteopontin gene affects MS occurrence and clinical course in a Polish population.

Participants, Materials/Methods: Participants: Disability in 100 MS patients was evaluated using the Expanded Disability Status Scale (EDSS). Genotype ad allele frequencies at exons 6 and 7 were examined by PCR. Using appropriate statistical test, the distribution of variables was tested and means +/- SD compared. **Results:** The EDSS score was higher in 8090 T/T + 9250 C/C patients than in 8090 C/C + 9250 C/C MS patients (p=0.0120), and the disability in 8090 C/C + 9250 C/T MS patients was higher than in 8090 C/C + 9250 C/C MS patients (p=0.0137). Logistic regression analysis revealed age to be an independent factor influencing disability.

Conclusions: Genotype distribution and allele frequency differences between patients and control individuals were not statistically significant. No association of OPN with susceptibility

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to MS was found in the Polish population. The polymorphism of the OPN gene in position 8090 T/T + 9250 C/C, 8090 C/C+9250 C/T, and 8090C/T+9250 C/T were linked with higher levels of disability in MS patients.

26. COMORBIDITIES IN PATIENTS WITH MULTIPLE SCLEROSIS

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Introduction/Objectives: Multiple sclerosis (MS) is a chronic inflammatory, autoimmune, demyelinating disease that affects the central nervous system (CNS). It is characterized by paroxysmal symptoms and neurological deterioration. MS occurs between 20 and 40 years of age, often in the female population. The cause has not yet been determined, but it is widely known that genetic background and environmental factors affect its manifestation. MS is a chronic disease which is followed by a wide range of comorbidities, such as psychiatric, autoimmune or vascular diseases and tumors. The aim of this review is to elaborate on each of those comorbidities, introduce data from various studies which have demonstrated the incidence and prevalence of those comorbidities and compare their prevalences in MS patients with the ones in the general population.

27. WHEN THE STROKE IS OVER?!

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Introduction/Objectives: Stroke is a leading cause of adult disability. More than half of stroke survivors are left dependent on others for daily activities. By 2020, stroke will have moved from the 6th to 4th leading cause of lost disability adjusted life years (DALY's, Murray). A stroke that leaves significant neurological deficits is sometimes referred to as chronic stroke when palliative care becomes appropriate. We distinguish: primary PC (managing both early deaths and survival with disability) and specialty PC (consultation for more complex problems). Coma, 82 dismissed 82 vegetative state or severely reduced level of consciousness for at least 3 days are hospice care criteria for acute stroke patients. To improve the quality of patients lives, we should pay attention to pain, nonpain physical and psychological symptoms.

Results: Our experience- In 2015th, in Region hospital Vinkovci, we have hospitalized 429 stroke patients. 31 patients (7,22%) were candidates for PC (25 ischaemias, 6 hemorrhages), 11 male, 20 female, mean age of 69. The most frequent risk factor was arterial hypertension (64%). Incontinence was present in 93,54% of patients, uroinfection in 19, febrility in 9, pneumonia in 6 and decubitus in 2 patients. 80,64% of patients were 82 dismissed to home care, 19,36% were send to an institutional care. 1 patient was organ donor, 7 patients died (22,58%).

Conclusions: Stroke patients need a responsive and prepared

healthcare system which will ensure PSC optimized for each individual, taking illness and treatment but also patient's personal characteristics into account. The space for progress lays in future research, validation and uniformity in declaration of brain death, which will ensure both: maximized outcomes for patient and family and opportunities for organ donation.

28. THE EFFECT OF PRIOR ANTITHROMBOTIC THERAPY IN ACUTE STROKE IN PATIENTS WITH ATRIAL FIBRILLATION

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Introduction/Objectives: Atrial fibrillation causes more severe strokes and it is related to higher mortality. Antithrombotic therapy is effective for primary and secondary stroke prevention.

Objective: To determine the effect of prior antithrombotic therapy in first-ever acute stroke in patients with non-valvular atrial fibrillation.

Participants, Materials/Methods: This retrospective study included 780 hospitalized patients with acute stroke and atrial fibrillation during a ten year period. Patients were divided into three groups according to prior antithrombotic therapy. Stroke severity was assessed according to National Institutes of Health Stroke Scale (NIHSS). Stroke outcome was assessed by the modified Rankin scale (mRS) at hospital discharge.

Results: The study included 124 patients with prior warfarin therapy; 221 patients with prior acetylsalicylic acid therapy and 435 patients with no prior antithrombotic therapy. Risk factors (diabetes mellitus, arterial hypertension, hyperlipidemia, cardiomyopathy) were significantly lower in the group with no prior antithrombotic treatment. Patients in the warfarin group were the youngest ($p < 0.001$), had a significantly lower cognitive decline frequency ($p = 0.007$), the best treatment outcome assessed by mRS ($p = 0.006$) and had a better outcome ($mRS \leq 2$) more often ($p = 0.04$). No statistically significant difference was found in initial presentation and in-hospital mortality. **Conclusions:** Prior anticoagulant treatment in patients with acute ischemic stroke and atrial fibrillation is associated with younger age, less severe stroke and more favorable clinical outcome. Prior acetylsalicylic acid therapy showed the lowest benefit in clinical outcome in patients with acute ischemic stroke and atrial fibrillation compared to patients with warfarin or with no prior treatment.

29. THE CLINICAL OUTCOME OF ENDOVASCULAR TREATMENT OF STENO-OCCLUSIVE LESIONS OF SUPRAAORTIC ARTERIES

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Introduction/Objectives: Stenoses and/or occlusions of supraaortic arteries are common, and often unrecognized, cause of

a wide range of conditions such as instability, vertigo, and hand pains and/or paraesthesia. We find that the number of problems caused by stenoses and occlusions of these arteries is indeed surprisingly high, especially taking into account the fact that this condition can be easily diagnosed (or at least suspected upon) – by measuring blood pressure values on both hands and comparing them.

In the present study we show the clinical outcomes after the endovascular treatment of clinically symptomatic subjects with these diagnoses. We present the results of a 8-year study, performed in the Clinic for diagnostic and interventional radiology of the Clinical hospital centre in Zagreb, Croatia from 2008 to 2015.

Participants, Materials/Methods: We report on a cohort of subjects (N=32) who underwent a DSA procedure at our clinic. Subjects were predominantly female (N=19), with mean age of 65.4 years. Indications subjects were presenting for were mostly vertigo (N=8) and arm pain (N=7), followed by paraesthesia (N=4), instability (N=3), arm weakness (N=3) and several other conditions. Median number of risk factors per subjects was 3, with the most common being HA (N=24), HLP (N=25), DM (N=25), CeVD (N=17), CaVD (N=11) and smoking (N=15). Prior to the procedure, all subjects had US test, while 17 also had MSCT. Indication was either occlusion (N=8) or stenosis (N=24).

Results: The intervention was successful in majority (N=26) of cases- PTA/PTA + stent, while the intervention was not successfully because of heavy calcificated occlusion in 4 subjects. Only two subjects experienced complications until intervention as dissection of artery.

Conclusions: All included subjects showed clear clinical improvement after the successful endovascular procedure. We therefore conclude that endovascular treatment should be the method of choice in symptomatic stenotic and occlusive lesions of the supraaortic arteries.

30. PLANNING AND PERFORMANCE OF MOTOR TASKS OF A PATIENT WITH CHOREA AND BALISTIC MOVEMENTS

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Introduction/Objectives: Hyperkinetic movements have been reported after ischaemic and haemorrhagic stroke. Hemichorea-hemiballism have been most commonly reported hyperkinetic movement after stroke.

The aim is to present the challenges of neurorehabilitation approach in patient with chorea and ballistic movements.

Case report: We report a case of a 61-year old female patient hospitalized at Stroke and Intensive Care Unit Department of neurology, University Hospital Sveti Duh. Four days prior to hospitalization involuntary movements of left-side extremities started, together with behavior changes. Upon admittance to hospital the neuroradiological methods (MSCT, MR, MRA) confirmed intracerebral hemorrhage in the right subthalamic nucleus region which was the next three weeks resorbed. Neurological status showed choreatic ballistic movements of the left

arm and leg. Involuntary movements were more observable when the patients was in psychological excites, while reduced when resting, even disappearing when sleeping. Medication had only a partial impact reduction involuntary movements.

Physiotherapeutical plan was to activate the patient outside the bed. Voluntary movements of the patient towards anti-gravity positions intensified choreoballistic movements of the left extremities aggravating her psychological condition inasmuch that she refused the physiotherapy. A gradual and tactical approach resulted in patients cooperation and motivation with a common goal set - the possibility of unassisted walking. The realization of the goal set developed through motor tasks – from simpler to more demanding. In two months in hospital the patient was able to walk with the assistance of another person.

Conclusions: Sensory tricks with deep somatic pressure showed good results regarding the calming of involuntary movements. The patient learned how to control choreoballistic movements with sensory tricks e.g.- when sitting a leg upon the other leg supporting the affected side with the backrest, side lying on the affected side, corner-standing.

In conclusion, patients with hyperkinetic movements after stroke require multidisciplinary team involved in their neurorehabilitation.

31. PREDILECTION ROLE OF BIRTH MONTH, EARLY VIRUS INFECTION AND SMOKING IN MULTIPLE SCLEROSIS OCCURRENCE

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Introduction/Objectives: To analyze birth month, presence of smoking and presence of an early infection with the viruses Herpes simplex, Epstein-Barr virus, Cytomegalovirus, and Rubella virus in persons suffering from Multiple sclerosis, by using titer of IgG and IgM antibodies.

Participants, Materials/Methods: The research included patients treated at Neurological Clinic in Sarajevo with MS (newly discovered) in the period January 2011-December 2013. In all of them, along with medical history and neurological examination, as well as tests for diagnosis confirmation (brain MRI, EP and CF examination), serological tests were performed on viruses HSV, RV, CMV and EBV, with a review of parameters of the former and new virus infection, birth month and smoking habit.

Results: The study included 311 patients with MS (68% female, 32% male), age 18 to 56. IgG HSV was positive in 68% patients (63%F and 37%M), and IgM in one person. IgG CMV was positive in 62% patients (18%F and 82%M), while IgM was negative in all of them. IgG RV was positive in 55% patients (71%F and 29%M), and IgM was negative in all, and IgG EBV was positive in 96% patients (75%F and 25%M), while IgM was negative in all persons. 72%F and 28%M were smokers. Most of them were born in May (32%), followed by November (32%) and April (17%).

Conclusions: Early infection with HSV, CMV, EBV and RV is

present in MS patients in significant number, and the conclusion refers to the fact that the crucial role in development of MS is the one of an early exposure to those viruses.

Smoking is present in high percentage, which certainly contributes to reduction of defensive strengths and damaging of immunity. Most examinees were born in May and November, which means in the colder part of the year.

32. THE EFFECT OF WALKING DISTANCE ON QUALITY OF LIFE IN PATIENTS WITH PAINFUL DIABETIC POLYNEUROPATHY

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Introduction/Objectives: Walking distance (WD) is an important criterion in estimating quality of life (QOL) of diabetic patients. Diabetic patients walk slower and have shorter WD compared to healthy controls. Claudication arising as a consequence of stenoses or occlusions in blood vessels of lower extremities is quoted as the most common cause. The focus of our interest was impact of WD on QOL.

Participants, Materials/Methods: Included in the study were 160 subjects with diabetic polyneuropathy (DPN).

Subjects were divided into painful and non-painful groups using VAS (Visual Analogue Scale) and LANNS (Leeds Assessment of Neuropathic Symptoms and Signs), taking into account the pain intensity at the moment as well as during the last month. QOL was assessed using the SF-36 (Short Form Health Survey) questionnaire. Additionally, a complete medical history was taken, followed by a detailed neurological examination, EMNG and Doppler US of lower extremities.

Results: The two groups were comparable in terms duration of diabetes, glycaemia control, lipid status, Doppler findings and DPN grade on Dyck scale.

Group with painful DPN had statistically significantly lower QOL in terms of both PCS (physical) and MCS (mental) measures of the SF-36 instrument.

Correlations of QOL to walking distance, EMNG and Doppler findings were investigated in all subjects. Our results show that subjects with radiculopathy have significantly lower QOL (in terms of MCS and PCS). Same is true for subjects with occlusion or stenosis, but only for the PCS measure. Regarding walking distance, subjects with shortest WD (50-100 m) as well as those with the longest WD (>500 m) had lower QOL in above mentioned terms compared to the group with WD of 100-500 m. These puzzling results are discussed in more detail in the main text.

Conclusions: In diabetic patients with DPN, walking distance, EMNG and Doppler findings are all significant predictors of subjects' quality of life. Unexpected results in correlation of QOL to WD show the need for scrutinized methodology in future studies.

33. INTRAVENOUS THROMBOLYSIS OF A PATIENT WITH ISCHAEMIC STROKE, CONTRALATERAL SIGNIFICANT STENOSIS OF THE INTERNAL CAROTID ARTERY AND IPSILATERAL STENOSIS OF THE MIDDLE CEREBRAL ARTERY – A CASE REPORT

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Introduction/Objectives: We are presenting a 71-year-old patient with acute ischaemic stroke, admitted to the University clinic for neurology with suddenly manifested right hemiplegia and complete aphasia, beginning one hour before examination. Hypertension and hyperlipidaemia were registered. The patient had been on regular antihypertensive, statin and antiplatelet therapy.

Participants, Materials/Methods: Evidenced upon admission: blood pressure 200/109 mm Hg, NIHSS 15, glycaemia 6.8 mmol/L, thrombocytes $241 \times 10^9/L$. An urgent CT brain scan revealed a normal finding; ASPECT score 10. After application of a Lasix ampoule, the blood pressure was 170/80 mm Hg. The patient had herein fulfilled the inclusion criteria for intravenous thrombolysis. The Actilyse treatment began: total dose 72 mL (7 mL in bolus, 65 mL in an infusion) within one-hour, while the vital parameters showed stable values. Minimal neurological status improvement was evidenced: NIHSS 13. The following day, the carotid and vertebral artery Doppler sonography revealed atheromatous alterations in the carotid arteries' extracranial segment and an unevenly-surfaced mixed plaque in the right bifurcation section, that entered the initial segment of the ICA and narrowed the lumen 80-90%. Intra-stenosis and post-stenosis elevated PSV and RI were noted, a result in favour of a significant carotid stenosis. The control CT brain scan disclosed a massive ischaemic stroke in the left MCA irrigation area. In addition, CT Angiography of the cerebral blood vessels showed a stenosis at the ramification of the M1, M2 segments of the left MCA (a thrombus cannot be excluded), with a gracile appearance of both M2 trunci, and the distal M3 and M4 segments. At the parenchyma window a sub-acute ischaemic lesion within the left MCA vascular area was seen. During the treatment the patient was treated with the usual ischaemic stroke therapy for three weeks.

Results: At discharge the patient, with NIHSS 13, was recommended suitable medication, physiotherapy and regulation of risk factors. The distinctiveness of this case is that a significant stenosis of the right carotid artery was diagnosed, which in this case was asymptomatic, whilst on the other hand, in the left MCA, a symptomatic stenosis and probable thrombus were visualized, which caused an ischaemic stroke.

Conclusions: With such high-risk patients a cautious approach is crucial in the choice of the most suitable treatment, in accordance with the contemporary guidelines.

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34. SUPERPOSITION OF PARANEOPLASTIC POLYNEUROPATHY AND SPASTIC PARAPARESIS WITH AXONAL POLYNEUROPATHY OF TOXIC GENESIS – CASE REPORT

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Introduction/Objectives: Paraneoplastic neurological syndroms are non-metastatic tumour complications for which there is no clear pathological process. They are formed as a reaction of the immune system to the presence of a tumour in the organism. They are caused by the activity of antibodies to neurogenic antigens. The tumour which is caused by the paraneoplastic neurological 85eficien can be diagnosed before the appearance of neurological symptoms and signs. The tumour is often occult and a more detailed diagnostics is 85eficienc. Neuropathy caused paraneoplastically is mostly caused by a microcellular lung cancer, breast, ovarian and prostate cancer. About 65-70% of patients with a microcellular lung cancer have some form of a paraneoplastic syndrome tied to the nervous system. The most common neuroplastic polyneuropathy is a subacute sensory neuropathy which is connected with a higher titer IgG of antinuclear antineuronal antibodies (ANNA-1, Anti Hu), which share the epitope with the microcellular lung cancer.

Alcohol polyneuropathy occurs as the result of a synergistic effect of alcohol and a nutritive 85eficiency followed by chronic alcoholism, it is mostly a vitamine B deficiency. Chronic alcoholism joined with a nutritive deficiency is a common cause of the sensorimotor polyneuropathy. Electroneurographic diagnostics indicates a distal symmetric axonal sensorimotor polyneuropathy.

Results: Our analysis describes a patient with a clinical picture of polyneuropathy and spastic paraparesis. Neuroradiological examination hasn't identified a clear patoanatomic substrate in the area of 85eficie spinalis. One of the possible differential diagnosis included a metabolic neuropathy caused by a vitamin B 12 and folate 85eficiency, which has been clinically presented by a combination of neuropathy and myelopathy with sensory ataxia, damage of the proprioceptive sense, spastic paraparesis and pathological reflexes. A hemathologic disorder, a macrocytic anemia is often accompanied. There were no signs of anemia with our patient. The analysis of the liquor eliminated a possible postinfective etiology, but oligoclonal IgG bands were detected in the liquor. The toxic or paraneoplastic etiology was suspected. Radiologic examination of the thorax verified a tumour in the left hilum area.

Conclusions: After the conducted procedures we think that the patient suffered an axonal, mostly sensory polyneuropathy of a probably mixed genesis, toxic on the basis of a longtime alcohol consumption and a possible nutritive deficiency, as well a paraneoplastic genesis due to a microcellular lung cancer. The clinical picture of a spastic paraparesis was probably a part of the paraneoplastic syndrome, too. The treatment is first of all directed to the basic therapy of the malignant illness, followed by a polyvitamine therapy due to the joined toxic etiology, as well as the abstinence from the use of alcohol.

35. SUPERPOSITION OF ALCOHOL POLYNEUROPATHY AND CRITICAL ILLNESS POLYNEUROPATHY- CASE REPORT

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Introduction/Objectives: Alcohol polyneuropathy is sensorimotor polyneuropathy with the compound of toxic and metabolic peripheral neuropathy. Chronic alcoholism could lead to this type of polyneuropathy, defined by synergistic output of toxic effect of alcohol and nutritional deficiency (vitamin B12 and folate). Critical illness polyneuropathy (CIP) can be seen in critically ill patients. Disorders of consciousness, sepsis and use of sedatives may lead to CIP. Multiorgan failure, use of mechanical ventilation and incompetence of separating from mechanical ventilation combined with the weakness of limbs, in an absence of other explanation, indicates the existence of CIP.

The diagnosis of polyneuropathy is based on history, clinical examination and diagnostic tests.

Case reports: A 35- years old patient, chronic alcoholic, was hospitalized at the Department of Neurology of General Hospital Karlovac in January of 2016. Progressive weakness of the extremities, paresthesia and pain of the distal parts of the lower limbs in duration of 3 months led to hospitalization. Due to several years of alcohol abuse, our patient has developed liver cirrhosis complications. In December 2015. He was hospitalized at the Intensive Care Unit (ICU) due to hepatic decompensation presented by hypovolemic shock and disorder of consciousness caused by acute anaemia and metabolic acidosis. Soon after the hospitalization patient has developed clinical deterioration leading to cardiorespiratory arrest and was mechanically ventilated followed by successful CPR. During his stay in hospital the develops septicaemia, but with positive outcome. EMG (12.2015.) has shown a severe sensorimotor predominantly axonal polyneuropathy. At discharge from the ICU general condition of the patient was stabilized, but it was followed by progression of neuropathy and lags tetrapareses with predominance paraparesis. Control EMG made during the re-hospitalization in January shows severe sensorimotor axonal and demyelinating polyneuropathy. We performed the lumbar puncture, CSF presented low protein content, without inflammatory cells. Immunological tests, genetic analysis of hereditary neuropathy, antiganglioside antibodies and paraneoplastic antibodies tests were unremarkable. The proper value of folic acid and elevated vitamine B12 were also found.

Conclusions: Based on the diagnostic procedures, we made the conclusion that the patient has developed a critical illness polyneuropathy superposed on pre-existing toxic neuropathy.

36. DO PATIENTS WITH STROKE AND NEWLY DIAGNOSED ATRIAL FIBRILLATION HAVE BENEFIT FROM PRIOR TREATMENT WITH ACETYLSALICYLIC ACID?

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Introduction/Objectives: Antiplatelet agents have a major significance for both primary and secondary stroke prevention. Our objective was to analyze whether acetylsalicylic acid (ASA) therapy prior to the onset of stroke in patients with newly diagnosed atrial fibrillation (AF) changes stroke outcome.

Participants, Materials/Methods: This retrospective study analyzed medical records of patients admitted to our Stroke Unit in the period of 2004.-2013. Due to acute stroke and with newly diagnosed AF. Two groups were formed: patients that have at the time of stroke been receiving ASA therapy (ASA+) and those without it (ASA-). None of the subjects was receiving any other antithrombotic agent at the time of stroke onset. The outcome variables (in-hospital mortality, initial severity of stroke assessed by NIHSS, modified Rankin scale (mRS), localization of stroke and antithrombotic therapy prescribed at discharge) were compared between the groups with appropriate statistical tests.

Results: There were 78 patients in ASA+ and 244 in ASA- group. ASA+ group differed from ASA- in terms of presence of ischemic heart disease/cardiomyopathy (65.4% vs. 52%; $p=0.04$), prior stroke (29.5% vs. 13.9%; $p=0.002$) and prior CHADS2 score (3.18 ± 1.19 vs. 2.55 ± 1.15 ; $p<0.001$).

Conclusions: Our results show that ASA therapy prior to the onset of stroke in patients with newly diagnosed AF is not associated with a better outcome. An emphasis should be put on screening for AF and introducing anticoagulant therapy according to current guidelines.

37. EFFECTS OF NEUROFEEDBACK ON THE BRAINWAVES IN INSOMNIA

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Introduction/Objectives: Sleep is a dynamical state where various electrophysiological changes occurs. These changes are often monitored via EEG to assist the diagnosis of sleep-related disorders. Neurofeedback works on the brain enhancing desired brainwaves, which can allow and regulate sleep, and potentially treat sleep disorders. In this study, we aim to quantify effects of neurofeedback on the brainwaves in insomnia patients.

Participants, Materials/Methods: A sequence of randomized qEEG sessions (one neurofeedback enhancing theta and sigma, but inhibit beta; one sham, 30 minutes each) was performed to 4 mild insomnia patients (34.8 +- 5.3 yrs; 3 males), registered at a sleep clinic. A standard 10-20 system was used for EEG recordings (20 channels). For each 30 s epoch, spectral power in standard

frequency bands (delta, alpha, theta, alpha and beta) and scaling exponent of detrended fluctuation analysis were calculated. These time series of these qEEG measures were further quantified and compared between the neurofeedback and sham sessions.

Results: The relative theta spectral power was reduced significantly during the neurofeedback treatment compared with the sham session (3.40 ± 1.3 vs 2.63 ± 1.36 ; $p = 0.048$). The EEG slowness (delta to alpha ratio) enhanced slightly during the treatment session (12.54 ± 9.82 vs 10.80 ± 9.18 ; $p = 0.726$). However, no changes were found in other qEEG measures.

Conclusions: The trend of EEG slowness during the neurofeedback session might imply the insomnia patients would feel sleepier during the treatment session, which may be associated with the effectiveness of the neurofeedback. The small size of our pilot data is a limitation of the current study and it requires further validation of the outcomes.

38. CORRELATION BETWEEN CHRONIC CARDIOMYOPATHY AND EPILEPSY AT ISCHEMIC CEREBROVASCULAR ACCIDENTS

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Introduction/Objectives: Summary: Epilepsy is a paroxysmal disorder of brain function, which happens and stops suddenly with recurrence tendency. The specific and complex problem is hypertension at CVA-s with epilepsy.

Purpose: of this paper is the analysis of CMP-chr and epilepsy cases in ischemic CVA-s. The frequency of CMP-chr and epilepsy cases at ischemic CVA-s (thrombosis and embolism). Correlation between CMP-chr and epilepsy cases at ischemic CVA. The definition of the relation among genders of ischemic CVA-s with epilepsy and CMP-chr.

Participants, Materials/Methods: Material and methods: The data source were the patients that have been hospitalized in Neurology Clinic for five years from January 2006 to December 2010. The study was retrospective.

Results: Results: 121 out of 6770 cases, have had CMP-chr at ischemic CVA. Whereas, the number of cases with CMP-chr and epilepsy at ischemic CVA was 71 cases. The number CMP-chr with epilepsy at embolism cases was 49 cases, while 32 or 83.11% were cases with thrombosis. Out of 36 cases, 21 cases or 58.33% are males and 15 cases or 41.67% are females.

Conclusions: Conclusion: Epilepsy with CMP-chr caused by ischemic CVA is highly expressed with a high significant contrast compared to cases without CMP-chr and represents a particular problem in the society, which causes permanent disabilities to the most patients, and it also requires a special treatment for epilepsy caused by CMP-chr and brain stroke. This disease often occurs in elderly patients and most of them are female patients. The diagnosis is determined according to neuroimaging and clinical examinations (EEG, CT, MRI).

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39. CORRELATION BETWEEN HYPERTENSION AND EPILEPSY AT HAEMORRHAGIC CEREBROVASCULAR ACCIDENTS

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Introduction/Objectives: Summary: Epilepsy is a paroxysmal disorder of brain function, which happens and stops suddenly with recurrence tendency. The specific and complex problem is hypertension at CVA-s with epilepsy.
Purpose: of this paper is the analysis of HTA and epilepsy cases in CVA-s and correlation with hemorrhagic CVA. The frequency of HTA and epilepsy cases at hemorrhagic CVA-s (intracerebral and subarachnoid). Correlation between HTA and epilepsy cases at hemorrhagic CVA and epilepsy without HTA cases at hemorrhagic CVA-s. The definition of the relation among genders of hemorrhagic CVA-s with epilepsy and HTA.
Participants, Materials/Methods: Material and methods: The data source were the patients that have been hospitalized in Neurology Clinic for five years from January 2006 to December 2010. The study was retrospective.
Conclusion: Epilepsy with HTA caused by hemorrhagic CVA is highly expressed with a high significant contrast compared to cases without HTA and represents a particular problem in the society, which causes permanent disabilities to the most patients, and it also requires a special treatment for epilepsy caused by HTA and brain hemorrhage. This disease often occurs in elderly patients and most of them are female patients. The diagnosis is determined according to neuroimaging and clinical examinations (EEG, CT, MRI).
Results: Results: 36 out of 6770 cases, have had a hemorrhagic CVA. Whereas, the number of cases with ICH and HTA with epilepsy was 30 cases or 83.11%, the number of epilepsy and HTA cases at SAH was 6 cases or 16.89%. The highest number of cases are patients with HTA and epilepsy at hemorrhagic CVA-s, 29 cases or 80.55%, while 7 cases or 19.44 % did not have HTA. Out of 36 cases, 21 cases or 58.33% are males and 15 cases or 41.67% are females.
Conclusions: Conclusion: Epilepsy with HTA caused by hemorrhagic CVA is highly expressed with a high significant contrast compared to cases without HTA and represents a particular problem in the society, which causes permanent disabilities to the most patients, and it also requires a special treatment for epilepsy caused by HTA and brain hemorrhage. This disease often occurs in elderly patients and most of them are female patients. The diagnosis is determined according to neuroimaging and clinical examinations (EEG, CT, MRI).

40. EARLY IDENTIFY OF VASCULAR PARKINSONISM

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Introduction/Objectives: Patients with stroke diagnosed with tests for early diagnosis of parkinsonism.
Participants, Materials/Methods: We study emotional disorders with stroke patients changes in the background and later diagnosed

with parkinsonism syndrome in order to identify the risk of stroke in 95 patients with (75 ± 8 years) HADS, The Giessen test and Vascular rating scale for VP conversion.

Results: The results of the test HADS 46% of patients with subclinical anxiety and depression, was found in 35% of patients with clinical depression and anxiety. in The Giessen test the survey, 25% of patients in different parts of the body pain, 19% of patients complained of internal organs. Vascular rating scale for VP by 5 percentage points to 9% patients.

Conclusions: According to an investigation of stroke patients emotional background changes, subjective complaints and Vascular rating scale for patients with a high score on the VP constant supervision and vaskulyar necessary to prevent the risk of parkinsonism.

41. THE EFFECT OF BROMOCRIPTINE IN THE TREATMENT OF THE HEMISPHERIC ISCHEMIC STROKE : THE INTERIM RESULTS

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Introduction/Objectives: To evaluate the effect of bromocriptine on motor impairment, functional disability and cognitive impairment after 5, 10 and 15 days of bromocriptine therapy in patients with hemispheric stroke by using clinical evaluation guided by the hemispheric stroke scale (HSS). Background: bromocriptine has been shown to improve cognitive abnormalities in chronic phase of ischemic stroke. Furthermore, a possible role for bromocriptine in the treatment of motor symptoms after ischemic stroke was investigated but was not proven yet up to now.
Participants, Materials/Methods: We conduct a double blinded clinical trial of bromocriptine (2,5 mg twice a day) or placebo to a group of patients with acute ischemic stroke. Changes of motor performance, cognitive impairment and functional disability are evaluated up to 20 days according to the HSS and modified Rankin scale (mRS). Laboratory tests (stroke risk factors, ECG, chest x-ray) were performed before the study entry and repeated whenever appropriate. Hemispheric ischemic stroke was confirmed by a CT scan.

Results: The mean age of currently enrolled patients was 69.0 (SD 7.8). Bromocriptine was well tolerated and seemed safe; the adverse effects/No of patients excluded was comparable between bromocriptine and placebo groups. Increased nausea was detected in 2 patients in bromocriptine and in 2 in placebo group. There were 3 patients excluded in the placebo group (medical reasons) and 2 in the bromocriptine group (1 transported to a regional hospital, 1 changing mind about study collaboration). At 15 days improvement was close to significance regarding motor functions in the bromocriptine group. Other results were not conclusive yet.
Conclusions: Our data suggest an effect of bromocriptine on faster motor improvement in acute ischemic stroke.

42. RISK FACTORS IN ACUTE STROKE PATIENTS WITH AND WITHOUT SLEEP APNEA

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Introduction: The aim was to analyze risk factors in acute stroke patients with and without sleep apnea.

Patients and Methods: It was analyzed 110 patients with acute stroke (AS) and sleep apnea, treated at Department of Neurology, University Clinical Center Tuzla in the period December 2009 thorough may 2010. Acute stroke has been verified either by computerized tomography or magnetic resonance imaging of the brain. Average age was 65.13 ± 9.27 years. Majority of patients were men (65/59%). The control group included the same number of patients with acute stroke without sleep apnea. Average age was 64 ± 8.69 years and sex ratio was the same as well. Statistical data was analyzed by Arcus Quickstat Biomedical statistical program with $p < 0.05$ considered significant.

Results: The largest number of the patients with apnea had heart diseases (101/91.8%), followed by hypertension (95/86.4%), body mass index (BMI) > 29 kg/m² (87/79.1%), hyperlipidemia (55/50%), smoking (42 /79.1%) and diabetes mellitus (23/20.9%). Without apnea had the largest number hypertension (92/83.6%), followed by heart diseases (89/81%), BMI > 29 kg/m² (67/60.1%), hyperlipidemia (53/48.2%), smoking (35/31.8%) and diabetes mellitus (22/20.1%).

Conclusion: There was a significant difference in the risk factors of the patients with and without sleep apnea as compared to hypertension ($*X^2=10.21$, $p=0.001$), heart disease ($*X^2=10.19$, $p=0.001$) and body mass index ($*X^2=7.81$, $p=0.005$), while hyperlipidemia ($X^2=1.49$ $p=0.22$), smoking ($X^2=3.54$, $p=0.06$) and diabetes mellitus ($X^2=0.48$, $p=0.06$) this difference was not statistically significant.

43. THE UNEXPECTED DEATH IN WERNICKE ENCEPHALOPATHY

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Introduction/Objectives: Wernicke encephalopathy (WE) is caused by thiamine (vitamin B1) deficiency. Thiamine deficiency causing Wernicke encephalopathy occurs most frequently in people with compromised absorption, increased metabolism or increased carbohydrate intake. Wernicke encephalopathy is a clinical diagnosis. Altered mental state, ocular abnormalities and cerebellar dysfunction define this condition. Long-term thiamine deficiency may cause heart failure, which requires thiamine supplementation.

Participants, Materials/Methods: The patient was admitted to our Emergency Center with symptoms that suggest the WE. The Patient was asleep, with cold and cyanotic extremities, "strange look," and he could not verticalize. Three days before admission he complained of headache and spoke incoherently. He had been treated for depression and alcoholism.

On admission he was unconscious, cardio-pulmonary subcompensation, dehydrated, tachypnoic, tachycardic, cyanotic, with prolonged bleeding after vein puncture, hypertensive. Neurological examination registered pupil mydriasis, convergent strabismus, bilateral abducens palsy, reduced muscle strength

extremities, more pronounced in the lower extremities (legs) to the extinguished reflexes in all extremities.

On the brain CT there were signs of diffuse cerebral cortical atrophy. The cerebrospinal fluid analysis was normal. Laboratory findings present leukocytosis with erythrocytosis, thrombocytopenia, prolonged prothrombin time, high nitrogen materials, high levels of inflammatory markers and metabolic acidosis. The toxicological analysis of blood excludes intoxication. On the lung radiography inflammation is registered, we made a nasal and throat swabs for H1N1 which was negative. After the applied therapeutic measures there was a significant improvement in the somatic condition, but the patients neurological condition was unchanged. As the clinical findings speak for WE administered iv thiamine., followed by an improvement on the findings on bulbomotors, but he was still ataxic, confused, disoriented. We did not find the cause of thrombocytopenia. Upon consultation with a psychiatrist, the patient is moved to the Department of Psychiatry.

While hospitalized at the Clinic for Psychiatry he was somatic stable, without major changes in the neuro / psychiatric status. On the brain MRI is registered signs for WE and expressed frontal cortical atrophy. There were no signs of major hemorrhage. Suddenly, on the 7th day of hospitalization cardiac arrest happened with unsuccessful cardiopulmonary resuscitation and death.

Conclusions: Despite adequate substitution thiamine there was a cardiac arrest. On the basis of our case, we conclude that further research is needed on the effect of thiamin on myocard and the heart function. Consequently, the treatment of patients with VE must occur in intensive care units with coordinated treatment by more specialist.

44. THE IMPACT OF VASCULAR RISK FACTORS ON COGNITIVE STATUS IN PATIENTS WITH STROKE

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Introduction/Objectives: Growing evidence suggests that risk factors for cognitive decline and dementia are the same risk factors for cerebrovascular disorders: diabetes, hypertension, heart diseases, cholesterol, smoking and alcohol abuse.

Participants, Materials/Methods: In this paper are processed 80 patients with stroke, admitted in Clinic for Neurology in Skopje. Vascular risk factors (VRF) are evaluated with standard questionnaire. Cognitive status is quantified one year after stroke with Mini Mental Status Scale (MMSE) and another neuropsychological tests. For the diagnosis of vascular dementia we use ICD-10 criteria.

Results: . One year after stroke 40% of patients have cognitive impairment and 12% development dementia. The frequency of VRF was: diabetes 37%, hypertension 71%, heart diseases 39%, increased level of cholesterol 36%, alcohol abuse 39% and 50% smoke cigarettes. The highest statistical correlation between VRF and cognitive impairment was for hypertension.

Conclusions: . The risk of development cognitive decline and

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dementia is higher when patient have many VRF. Their early detection and treatment is important in stroke prevention and prevention of cognitive decline and dementia after stroke.

45. BCI COMMUNICATOR-A STEP TOWARDS COMMUNICATION WITH THE LOCKED-IN STATE

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Introduction/Objectives: Abstract – People in locked in state (LIS) are usually considered to be in unconscious state by the care givers, which is also often not true. In this state the person is completely conscious and his brain still actively responds to external stimuli like sensory, visual or auditory. With Brain Computer Interface (BCI) one can detect electrical impulses of the brain in the form of continuous signal, we are using this technique to detect these responses to stimuli. In this particular case we observe the electroencephalography (EEG) signals of the user to find response to stimuli for auditory stimulus. Auditory event related potentials (ERP) for responses to target and non-target are obtained after a simple averaging of the EEG data. The experimental setup and EEG acquisition algorithm is been explained in detail. Current data acquisition is done with test subjects. Our BCI communicator is compared with the visual P300 system. Further research will be focused on data analysis and classification in order to design a real time classifier for auditory response to stimuli.

46. COGNITIVE DEFICIT IN OBSTRUCTIVE SLEEP APNEA

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Introduction/Objectives: To investigate the cognitive deficits in OSA using combined neuropsychologic testing. A total of 15 obstructive sleep patients and 15 age-matched healthy control subjects underwent a sleep study and cognitive tests.

Participants, Materials/Methods: Fifteen severe (AHI ≥ 30) patients with OSA (age range, 40–65) and 15 age- and education-matched healthy control subjects were studied. Inclusion criteria for OSA were apnea–hypopnea index (AHI) greater than 30. The controls were diagnosed clinically as not having OSAS due to its exclusion based on their responses on validated questionnaires (STOP-BANG ≥ 2 , and Epworth Sleepiness Scale ≥ 6). To avoid unjustified expenses, PSG studies were not performed in the controls.

Also, exclusion criteria were symptoms of rapid cognitive deterioration; sleep disorders other than OSA; use of psychoactive medications. All participants underwent a neuropsychologic evaluation of short- and long-term memory, executive functions, constructional abilities, vigilance, attention, and abstract reasoning (see online supplement). In addition, participants completed the STOP-BANG and Epworth Sleepiness Scale to evaluate daytime somnolence, the Beck Depression Inventory to evaluate mood. Group differences were investigated using nonparametric two-

sample (Mann-Whitney U test) and paired (Wilcoxon signedrank test) t tests.

Results: OSA subjects were more obese ($p < 0.025$) and more sleepy ($p < 0.005$) than control subjects, and on all neurocognitive measures were poorer than control subjects ($p < 0.027$).

Conclusions: The cognitive deficits clearly exist in OSA and may be explained by sleep deprivation and chronic nocturnal intermittent hypoxemia. The exact pathophysiological mechanism is unknown.

47. INFLUENCE OF DIET ON DISEASE AND SYMPTOMS IN MULTIPLE SCLEROSIS

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Introduction/Objectives: Preserving good health is the greatest challenge for individuals suffering from chronic diseases. Balanced and well planned diet helps us to achieve this goal. Even though, at the moment there is no 'multiple sclerosis diet' available, what and how we eat has a great effect on the level of energy, bladder function, bowel function, as well as on an overall health status of the individual.

Evidence shows that diet has a dual effect on disease. While some ingredients encourage prevention of disease progression, others help fight symptoms. Studies have been done with foods rich in animal fat, saturated and unsaturated fats and omega-3 fatty acid, influence of vitamin D, antioxidants, gluten. Their influence on disease symptoms has been studied.

Because of the initiative of Nacional Society for Multiple Sclerosis, to support and expand investigation of lifestyle habits of multiple sclerosis patients, new and more complete data will soon give answers we are waiting for.

But, until we get official data of these trials, the existing recommendation is to be followed: consume lots of vitamin D, avoid salty and fatty foods, consume more fruits and vegetables, and maintain a balanced diet. It is also important to care about your weight, because increased weight, just like binge eating, cause fatigue, strain the joints, heart and lungs, and increase the risk of developing other diseases like heart disease, diabetes or hypertension, which further complicate the disease. Keep in mind that every major change in diet, food supplements or lifestyle changes should be discussed with the physician responsible for the patient.

48. STEROID UNRESPONSIVE RELAPSING-REMITTING MULTIPLE SCLEROSIS TREATED WITH PLASMA EXCHANGE: A CASE REPORT AND DISCUSSION OF PATHOPHYSIOLOGY

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Introduction/Objectives: Multiple sclerosis (MS) is a chronic,

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inflammatory, demyelinating disease of the central nervous system. The most common type of MS is relapsing-remitting multiple sclerosis (RRMS), characterized by acute exacerbations of the disease followed by periods of partial or complete recovery. The first-line treatment in relapses is pulse corticosteroid therapy. However, in some relapses, steroid therapy fails to produce a reduction of even one point in the extended disability status scale (EDSS) seven days after application. These are referred to as steroid unresponsive relapses and present a significant therapeutic challenge. One of the possible approaches in these cases is plasma exchange, a method otherwise rarely used in the treatment of MS. While MS was long considered a result of immune processes predominantly mediated by cellular immunity, recent research has shed light on the perhaps equal importance of the humoral component. Neuropathological studies have recognized four distinct lesion patterns in MS, of which pattern II exhibits immunoglobulin and complement deposits within plaques.

Participants, Materials/Methods: We present the case of a 41-year-old male patient with an established diagnosis of relapsing-remitting multiple sclerosis who experienced four disabling relapses in a 7-month period with EDSS >4. The first clinical manifestation of his disease occurred 3 years earlier and resolved with pulse corticosteroid therapy. Of the four recent flare-ups, two were steroid-unresponsive. In both instances, the decision was made to attempt plasma exchange as a treatment.

Results: In both of the steroid-unresponsive relapses the patient displayed marked improvement of clinical status on application of plasma exchange therapy with reduction of EDSS to 2.5. Due to the aggressiveness of the disease, after resolution of the fourth relapse, a course of alemtuzumab (Lemtrada) was administered, to which the patient responded well. A year later, he remains clinically and radiologically stable and is due to receive his second course of alemtuzumab.

Conclusions: The patient's good clinical response to plasma exchange therapy, a treatment modality directed solely against humoral immune mechanisms, lends support to the hypothesis that humoral immunity plays a significant role in the pathogenesis of steroid-unresponsive relapses of RRMS. The beneficial effect of monoclonal antibodies on the progression of the disease could result from anti-CD52-mediated B-cell depletion, providing additional support to this concept.

49. COMPERING PLASMA LEVELS OF EXCITATORY AND INHIBITORY NEUROAMINO ACIDS IN FIRST-EVER ACUTE ISCHEMIC STROKE SURVIVORS DEPENDING ON THE EXISTENCE OF POST-STROKE SPASTICITY ON THE 6TH MONTH AFTER STROKE

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Introduction/Objectives: Post-stroke spasticity is one of the most common complications of stroke survivors well being. The origin of this problem is not completely discovered. The aim of this study was to investigate whether there are difference between concentrations of neuroamino acids that serve as neurotransmitter in the acute phase of stroke survivors who were divided

subsequently into two groups (those who showed spasticity on the 6th month and those who did not).

Participants, Materials/Methods: 97 patients with fist-ever ischemic stroke (46 women, 51 men) had been followed during 6 months after stroke onset. Mean age was 60,13 +0,92. 15 people with chronic cerebral ischemia served as control group (mean age 60,23 +1,82). Plasma level of excitatory (glutamate, aspartate, glutamic acid, aspartic acid, tyrosine) and inhibitory (glycine, GABA, taurine) were investigated during first 72 hours after stroke onset. Automatic amino acid analyzer LC Biotronik was used for amino acids determination. All patients were divided into 2 groups depending on the existence of post-stroke spasticity on the 6th month after admission to the stroke unit. 48 patients showed post-stroke spasticity (26 were hemispastic, 22 with upper limb spasticity).

Results: Analysis of the data we have got showed activation of the excitatory amino acid's system in both groups of patients and accompanying decrease in inhibitory amino acid's system in group of patients who have got spasticity. In patients who did not show increased muscle tone we observed an increase in the inhibitory amino acid's levels in response to an excessive amount of excitatory neurotransmitters.

Conclusions: The found insufficiency of inhibitory amino acid's system in acute phase of ischemic stroke in some group of patients, who are prone to post-stroke spasticity subsequently, can be used for screening such patients for their early rehabilitation. This study needs more attention in order to find possibility for pharmaceutical correction of the poor inhibitory amino acid's pool.

50. COMPARISON OF ELECTROENCEPHALOGRAPHIC ABNORMALITIES IN NONPOLIO ENTEROVIRUSES (NPEVS) MENINGITIS IN CHILDREN AND ADULTS

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Introduction: The nonpolio enteroviruses (NPEVs) belong to the genus *Enterovirus* and family *Picornaviridae*. About 30 types of NPEVs cause aseptic meningitis in which often electroencephalographic detected abnormal nonspecific, slowly diffuse or focal dysrhythmia.

Objective: Comparison of electroencephalographic changes in NPEVs meningitis among children and adults

Participants, Materials/Methods: Retrospective study included 78 patients ,treated in General County Hospital Požega in 2009, with NPEVs meningitis confirmed analysis CFS (moderate lymphocytic pleocytosis, normal or moderate proteinorachya, negative bacteriology CFS). Exclusion criteria: history of the epilepsy, previous head trauma, psychiatric or neurological disorders.

Electroencephalographic was performed in the acute phase of the disease and the controls, the 21 channel EEG apparatus MEDELEC, sensitivity 70µv/cm, high filter frequencies of 70Hz, and the results are interpreted according to the standards for age. Statistical methods: X² test, statistical significance of p <0.05

Results: The study included a total of 78 patients, 74% of children (58/78), 26% of adults (20/78), the prevalence of patients in the pediatric population was statistically significantly higher (p=0.001).

CFS analysis:

Child population: range of mononuclear cells 4-1520/mm³, X±SD 139±177; proteinorachya 0.17-1.28 g/L, X±SD 0.37±0.45.

Adult population: range of mononuclear cells 6-822/mm³, X±SD 169±233; proteinorachya 0.26-0.89 g/L, X±SD 0.50±0.18.

Not verified statistically significant difference in pleocytosis, the distribution of mononuclear cells between children and adults (p=0,248, p=0,526), proteinorachya was significantly higher among adults (p=0.044). Pathological electroencephalographic registered in 80% of adult statistically significantly higher than in children (33%), p=0.001, without statistically significant differences among the population of children with abnormal and normal EEG compared to CSF findings (pleocytosis p=0,512, mononuclear p=0,684), similar results among adults (pleocytosis p=0,622, mononuclear p=0,620). There was no significant difference in the type of EEG changes among the studied population, p=0.388. Diffuse dysrhythmia verified in 63% of adult and in 43% of children, and the focal dysrhythmia verified in 37% of adults (frontocentral 66%, frontotemporoparietal region 25%) and in 57% of children (bilateral occipital 45%, unilateral occipital 18%, centrotemporal right 18%, frontocentral region 18%). After a year of follow-up registered pathology EEG: 20% of adults, 7% of children (p=0,294).

Conclusion: In NPEVs meningitis often register electroencephalographic abnormalities with normal neurological examination, which implies the existence of subclinical encephalitis or encephalopathy, there is a need clinical and encephalographic monitoring purpose the timely detection and treatment of possible seizures.

51. ACUTE ISCHEMIC STROKE AND CONTRAST MIMICKING A SUBARACHNOIDAL HEMORRHAGE AFTER CORONARY ANGIOPLASTY

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Introduction/Objectives: Use of non-ionic contrast media (CM) in coronary arteriography has been reported to cause transient cortical blindness, confusion, amnesia and very rare focal deficits.

Case report: A 69-year old woman, with stable angina pectoris and stent placement in right coronary artery (RCA) eight years earlier, underwent transfemoral coronary angioplasty with recanalization and stent placement in RCA due to subtotal in-stent restenosis. Additional treatment included 10 000 IU heparin, aspirin 100 mg and clopidogrel 600 mg. A half an hour after the procedure, she suffered chest pain with aphasia, confusion and right hand paresis. She underwent second interventional procedure with recanalization and two stents placement due to confirmed acute in-stent thrombosis, followed by eptifibatid bolus and infusion. A non-ionic contrast was used in both procedures. Immediately after, she underwent neurological examination which

revealed recovery of aphasia and persistence of right central facial palsy, right mild hemiparesis and hemihypoesthesia with facilitated miotatic reflexes. Brain CT showed acute cortical and subcortical frontoparietal cerebral infarction with hyperdense content filling the sulci of left hemisphere, which was diagnosed as subarachnoidal hemorrhage (SAH). At this time the patient was referred to our stroke unit. No vascular malformations were detected on CT cerebral angiography. Dual antiplatelet treatment including aspirin and clopidogrel was continued. Complete neurological recovery was observed within 48 hours postangiography. As observed with repeated CT scans, sulcal hyperdensities mostly faded after 24 hours and totally disappeared within 7 days when she was discharged home.

Conclusions: Our case shows transient neurological symptoms and rapid disappearing of sulcal hyperdensities, suggesting temporary blood brain barrier disruption, consequential cerebral infarction and contrast media extravasation as the main mechanisms which allowed us to treat patient with dual antiplatelet therapy.

52. MYASTHENIA GRAVIS: SOME CLINICAL DATA OF 97 PATIENTS FOLLOWED IN LAST TEN YEARS AT TUZLA DEPARTMENT OF NEUROLOGY

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Introduction: The aim of this study was to evaluate the elementary clinical features of patients with Myasthenia Gravis (MG) that have been treated at the University Clinical Center Tuzla, Department of Neurology in last ten years

Patients and Methods: It is analyzed medical records of 97 patients with MG that have been treated in in University Clinical Center Tuzla, Department of Neurology in last ten years.

Results: Out of 97 analyzed patients 68 (70.10%) were females and 29 (29.89%) were males. Average age was 57.14±15.69 years. The most common signs of a disease on last exam are: ptosis (78/77.32%), followed by fatigue (38/39.18%), nasal-sounding of speech (34/35.05%), diplopia (31/31.96%), muscle weakness 26 (26.80%), dysphagia (20/20.62%), dyspnea (17/17.53%) and chewing difficulties (10/10.31%). According to the Osserman classification of the disease the most common types are IIa and Iib each 8 (8.25%) patients, then Iia / Iib and type II each 4 (4.12%) and the ocular form 3 (3.09%). The onset of disease was most frequent in the age of 51-70 years (39/39.6%)(average 59±5.77 years), and in the age of 31-50 years (33/33.9%)(average 43±5.36 years), followed by the age of 11-30 (16/16.3%)(average 21±16.3%) and in the age of 71-90 (10/10.2%)(average 73.5±4.70). Out of the 97 analyzed patients thymectomy was performed on 35 (36.08%), and histopathologic findings of timoma were identified in 6 (6.19%) patients. Associated autoimmune disease was verified in 18 (18.55%) patients. The most common associated diseases are: struma multinodosa glandullae thyreoideae in 8 patients (8.25%), hypothyroidism in 4 (4.12%), polymyositis in 2 (2.06%), rheumatoid arthritis in 3 (3.09%), hyperthyroidism in 1 (1.03%) patient. The most common comorbidities were Hypertensio arterialis in 40 patients (41.40%), diabetes mellitus in 13 patients

(13.40%), hypertensive heart disease 15 (15.46).

Conclusion: The myasthenia gravis is more frequent in female (70.10%) than in males (29.89%). The most common symptoms are ptosis and fatigue. Onset of the disease is most common in the age of 51-70 (39.6%) and in the age of 31-50 (33/33.9%). The autoimmune diseases are relative common in MG 92 patients (18.55%) and hyperthyroidism is most frequent.

53. EPIDEMIOLOGICAL CHARACTERISTICS OF DEMENTIA TREATMENT IN CROATIA

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Introduction/Objectives: In spite of the increase in the number of patients with dementia in countries with older population, basic epidemiologic data are still scarce.

The objective of this paper is to investigate pharmacoepidemiological characteristics of treatment of dementia in Croatia, and to present them in the context of certain epidemiological characteristics that illustrate the growing pressure this disease exerts on the healthcare system.

Participants, Materials/Methods: The data on medication utilization were taken from Croatian Health Insurance Fund (HZZO) and Agency for Medicinal Products and Medical Devices of Croatia (HALMED). The data on the number of hospital stays were supplied by Croatian Institute of Public Health (HZJZ). The internal data on the number of outpatient examinations from the Clinical hospital "Sveti Duh" were used as well.

All data were processed in Microsoft Excel. Methods of descriptive statistics were used as well.

Results: In the observed period (2012 – 2014), 4568 patients were treated with anti-dementia medications, of which 1275 (32%) with donepezil, and 2753 (68%) with memantine. According to HALMED, the utilization of those medications is constantly increasing, and has increased manifold from 2005 to 2014. The estimate of the proportion of treated patients with dementia aged 60 years and over is around 9.2%. The number of dementia-related hospital stays is also increasing, and has increased by 9.6% in the last 5-year period, compared to the preceding 5-year period. The number of outpatient examinations in Clinical Hospital "Sveti Duh" grew from 351 in 2007 to 1151 in 2015 (January 1st - October 26th).

Conclusions: A low number of patients with dementia are being treated pharmacologically at the moment, so it is necessary to monitor the changes in this number in accordance with the current and future guidelines and knowledge associated with the treatment of dementia.

A greater level of cooperation should exist between psychiatry and neurology specialists, in order to separate symptoms and signs of dementia from other co-existing conditions, both psychiatric and neurological, which are often present in the affected population. An assessment by both specialists could reliably identify proper candidates who could benefit the most by using anti-dementia medications.

54. ANOSOGNOSIA AFTER STROKE: FREQUENCY AND IMPACT ON DEGREE OF DEPENDENCE IN ACTIVITY DAILY LIVING

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Introduction: Anosognosia is not recognizing or lack of patient's awareness of his neurological deficit. Patients with anosognosia in the acute stroke have lower Barthel index and a lower degree of independence. The aim of this study was to evaluate frequency and impact of anosognosia on degree of dependence in activity daily living (ADL).

Patients and Methods: It was analyzed 191 patients with first-ever stroke (ischemic and haemorrhagic) treated at the Clinic for Neurology, University Clinical Center Tuzla. First test has been done in the first week after the stroke onset and re-test has been done in fifth week as well. Among 117 retested patients 33 (61%) had anosognosia in acute stroke and 84 (61%) did not. For evaluation of anosognosia it was used Bisiach scale (1986) and Barthel index for evaluation of activity daily living. Due to various reasons (death, finance, non-motivation, etc.) 74 patients out of 191 did not take place in re-test.

Results: Anosognosia was verified in 54 (28%) patients in acute stroke. Severe or full dependence in ADL in group of patients with anosognosia was in 24 (73%) as well as in 30 (36%) patients with no anosognosia. This is statistically significant ($p=0.0007$). In fifth week after the stroke severe or full dependence was in 15 (45.5%) patients with anosognosia as well as in 11 (13%) without ($p=0.0004$).

Conclusion: Frequency of anosognosia after the stroke is high (28%). Anosognosia significantly makes worse activity daily living in patients after the stroke.

55. FREQUENCY OF THE PAIN AND SLEEP PROBLEMS AT PATIENTS WITH DYSTONIA AND INFLUENCE OF DEEP BRAIN STIMULATION ON THEM

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Introduction/Objectives: Pain and sleep problems are often neglected and under-recognized and affect significantly quality of life and disability.

Our aim was to see the frequency of them at dystonia patients and influence of the Deep brain stimulation (DBS).

Participants, Materials/Methods: We conducted investigation with appropriate scales: Pittsburgh Sleep Quality Index (PSQI), Visual Analogue Scale and McGill questionnaire and anamnesis' data. The study involved randomly selected 70 dystonia patients (20 generalized dystonia, 25 cervical dystonia and 25 facial dystonia: blepharospasm, oromandibular dystonia and hemifacial spasm) and 10 patients that had treated with DBS last year. For all patients we did the investigation again after 6 months and for DBS patients before DBS and 6 months after operation. In addition we try to see factors that were connected with pain and sleep

problems.

Results: The pain prevalence was 85%. Depression was present in 45% of patients and constipation in 40% of patients, sleep disturbances in 30% and cognitive disturbances in 20% of patients. After deep brain stimulation we observed significant decreased in frequency concerning sleep problems (from 45 % to 10% of patients) and pain (from 70% to 25%) ($p < 0,05$). We found that both symptoms were associated with depression and pain, also, with present dyskinesias.

Conclusions: There is rather high frequency of the pain and sleep problems at PD patients and they should have to be assessed regularly in our clinical practice. DBS helps in relieving of the pain and sleep problems.

56. IMPROVEMENT OF SLEEP QUALITY AFTER DEEP BRAIN STIMULATION IN ADVANCED PARKINSON'S DISEASE

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Introduction/Objectives: Parkinson's disease (PD) is a neurodegenerative disease with motor and nonmotor symptoms. Sleep problems are common symptom in PD patients. Our aim was to see influence of deep brain stimulation (DBS) of the subthalamic nucleus (STN) on sleep problems in PD patients using Parkinson's disease sleep scale (PDSS) and their subjective issue about sleep quality.

Participants, Materials/Methods: We tested 24 patients with advance PD before and 3 months after DBS. Also, we used Unified Parkinson's Disease Rating Scale- motor part (III), Hospital Anxiety and Depression scale (HAD) and levodopa dosage.

Results: We found statistically significant improvement in motor symptoms (UPDRS III) and mean total PDSS score 3 months after DBS. Statistically significant improvement was found in parts of PDSS considering quality of sleep, night-time motor symptoms and daytime sleepiness.

Conclusions: In conclusion, we found that DBS, beside motor symptoms, improves sleep problems.

57. ACUTE INFLAMMATORY DEMYELINATING POLYNEUROPATHY ASSOCIATED WITH INFLUENZA A INFECTION: CASE REPORT

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Introduction/Objectives: Guillain-Barre syndrome (GBS) is an acute monophasic immune mediated disease of the peripheral nervous system that usually occurs after diseases of the digestive or

respiratory system. It can occur after influenza or rarely after vaccination against influenza. The spectrum of GBS includes acute inflammatory demyelinating polyneuropathy (AIDP), acute motor axonal neuropathy (AMAN), acute motor sensory axonal neuropathy (AMSAN), and some other variant like Miller-Fisher syndrome (MFS).

Participants, Materials/Methods: Patient with AIDP variant of GBS after severe bilateral pneumonia and ARDS due the influenza A virus is presented.

Case report: 57-year-old female was admitted to County General Hospital Požega, Department of Internal Medicine, because of severe ARDS due to bilateral pneumonia during influenza epidemic. After two days she was transmitted to the Intensive Care Unit and than to the Department of Neurology. The course of the disease was complicated with the onset of quadriplegia caused by AIDP variant of GBS. She was treated with intravenous immunoglobulin (IVIG) 0.4 g/kg/day for five days and she completed the physical therapy treatment. Two years after the onset of the disease, motor deficit of all the limbs recovered to the level of paralysis 4-5/5 degree.

Conclusions: We reported a case of AIDP variant of GBS associated with proven influenza A infection. Once the diagnosis of GBS is suspected or established, the treatment with intravenous immunoglobulin or plasma exchange (PE) is indicated.

58. MEGALENCEPHALIC LEUKOENCEPHALOPATHY WITH SUBCORTICAL CYSTS

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Introduction: The classic phenotype of megancephalic leukoencephalopathy with subcortical cysts (MLC) is characterized by early – onset macrocephaly, often in combination with mild gross motor development delay and seizures; gradual onset of ataxia, spasticity and sometimes extrapyramidal findings; and usually late onset of mild mental deterioration.

Case report: A 30-year-old woman presented with megalencephaly, epilepsy and delayed mental and motor signs (brisk reflexes, with bilateral pyramidal signs, and spastic gait). MR of the brain revealed extensive and diffuse white matter changes in the cerebral hemispheres, increased signal intensity on T2W images, decreased signal intensity on T1W images, sparing the internal capsule and deep grey matter structures. Two focal lesions in the corona radiata on the right were enhanced after contrast medium administration. One year later, the control MR images showed a decreased volume of lesions with very discrete, almost invisible enhancement.

Discussion and Conclusion: These findings, which are pathognomonic for MLC, were found in the present case. However, in our patient two focal lesions in the corona radiata showed transient contrast enhancement. We found no similar cases

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in the literature. Transiently enhancing lesions are not a feature of MLC, because the basic defect in MLC is in volume regulation by astrocytes. These acute lesions probably do not correspond to those in demyelinating disease, but could be explained by other transient etiologies, such as infection, inflammatory lesion or other etiology occurring with MLC.

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- Djelotvornost dokazana u kliničkim studijama na > 2700 bolesnika^{1,2,3,4}
- Sigurnosni profil dosljedan kroz provedene kliničke studije⁵
- Selektivan mehanizam djelovanja koji čuva imunološki sustav^{6,7}
- Praktično doziranje: jedna tableta, jednom dnevno, u bilo koje doba dana⁸

SKRAĆENE SAŽETAK OPISA SVOJSTAVA LIJEKA – I. NAZIV LIJEKA I SASTAV Aubagio 14 mg 14dne obložena tableta sadrži 14 mg teriflunomida. **2. TERAPIJSKE INDIKACIJE** Za liječenje odraslih bolesnika s relapsno-remitivnom multiplo sklerozom (MS). **3. DOZIRANJE I NAČIN PRIMJENE** Preporučena doza lijeka AUBAGIO je 14 mg jedanput na dan. Tablete se moraju progutati cijele s malo vode. **4. OPIS LIJEKA** AUBAGIO se mora primijeniti uz oprez u bolesnika u dobi od 65 godina i starijih zbog nelagodnosti povezanih s sigurnosnim i djelotvornosnim obilježjima lijeka. Nije potrebno prilagoditi dozu u bolesnika s blagim, umjerenim ili teškim obilježjima bolesti ili funkcije bubrega koji se ne liječe. **5. SIGURNOSNI PROFIL** Sigurnosni i toksični učinci teriflunomida (14 mg) u bolesnika s relapsno-remitivnom MS su slični onima u bolesnika s relapsno-remitivnom MS. Najčešće su blage i uključuju glavobolju, umor, mučninu, bol u mišićima i bol u zglobovima. **6. MEHANIZAM DJELOVANJA** Teriflunomid je selektivni inhibitor dihidrofolatna reduktaze (DHFR) koji selektivno inhibira proliferaciju T-limfocita. **7. FUNKCIJSKI PROFIL** Teriflunomid je selektivni inhibitor dihidrofolatna reduktaze (DHFR) koji selektivno inhibira proliferaciju T-limfocita. **8. NAČIN I MJESTO IZDANJA** Na recept, u ljekarni. Detaljne informacije o ovom lijeku dostupne su na web stranici Sanofi-a: <http://www.sanofi.hr>.

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