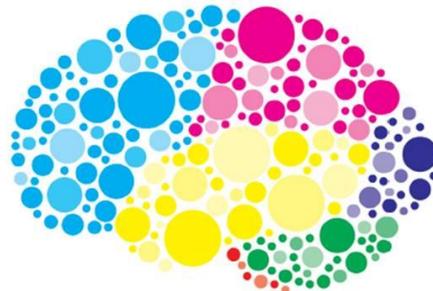


# ABSTRACT BOOK 2018

**58<sup>th</sup>** *International  
Neuropsychiatric Congress*



**Mind&Brain**

*Main Theme* **Bridging between  
Neurology & Psychiatry**

<i>Stroke</i>	<i>Alzheimer's &amp; Other Dementias</i>
<i>Epilepsy</i>	<i>Personality Disorders</i>
<i>Headache &amp; Pain</i>	<i>Bipolar Disorders</i>
<i>Multiple Sclerosis</i>	<i>Psychosis</i>
<i>Movement Disorders</i>	<i>Depression</i>

**58<sup>th</sup> INTERNATIONAL NEUROPSYCHIATRIC CONGRESS**

**Pula, Croatia**

**MAY 25-27, 2018**

**ISSN 2469-5748**

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**WORLD FEDERATION OF NEUROLOGY**



**EUROPEAN ACADEMY OF NEUROLOGY**



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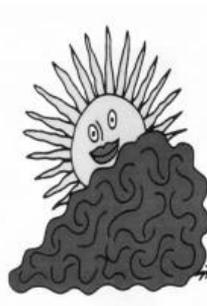


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CENTRAL AND EASTERN EUROPEAN STROKE SOCIETY



CROATIAN STROKE SOCIETY



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**PROGRAM**

**FRIDAY, May 25<sup>th</sup>, 2018**

- 08:30-09:00**            **OPENING CEREMONY**  
**Ulika Hall**
- 09:00-09:30**            **OPENING LECTURE**  
**Ulika Hall**            K. Fuxe: GPCR heteroreceptor complexes give a new dimension to molecular neuroscience
- 09:30-12:15**            **MAIN THEME**  
**Ulika Hall**            Chairpersons: F. Fazekas & K. Bechter  
F. Fazekas: 2017 Revisions of the McDonald criteria: What is new and where are we heading to ?  
E. Koutsouraki: Cognitive impairment in Greek multiple sclerosis patients  
U. Rot: Immunotherapy in multiple sclerosis  
P. Brečić: The new insights in relationship between depression and pain  
O. Sinanović: Tinnitus in neurological practice  
K. Bechter: Chronic tinnitus and psychopathologic comorbidities  
F. Benedetti: Cortical and subcortical volume abnormalities associated with pediatric and adult Obsessive-Compulsive Disorder  
I. Šain: Challenges of group psychotherapy in adolescents
- 12:15-13:00**            **MERCK SATELLITE SYMPOSIUM**  
**Ulika Hall**            **MAVENCLAD®- LIJEČENJE VISOKO AKTIVNE RELAPSNE MULTIPLE SKLEROZE**  
V. Bašić Kes
- 13:00-14:30**            **LUNCH**
- 14:30-17:30**            **PSYCHOPATHOLOGY SUMMER SCHOOL**  
**Ulika Hall**            Chairpersons: K. Bechter & M. Brüne  
M. Bechi: Family stress and social cognition in schizophrenia  
K.J. Bär: Trauma and pain- a surprising relation  
M. Brüne: Childhood Trauma interacts with OXTR genes Variation and pain empathy  
A. Buchheim: Update on psychotherapy of psychological trauma
- YOUNG RESEARCHERS TRACK IN PSYCHOPATHOLOGY SUMMER SCHOOL**  
C. Schubert: Psychotherapy in refugees with complex PTSD – cultural differences and preconceptions  
G. Agostini: Cognitive and social dysfunction in schizophrenia: role of premorbid adjustment  
C. Schubert: Ethical aspects in the (mental) health treatment of refugees with PTSD  
T. Glavina: The special features of emergency reception of depressive disorders at the University hospital centre Split Psychiatric Clinic

Program

- 14:30-16:00**      **CENTRAL AND EASTERN STROKE SOCIETY SYMPOSIUM**  
**Bianca Istriana Hall**      Chairpersons: V. Demarin & K. Niederkorn
- V. Demarin: The role of CEES in global fight against stroke  
M. Mijajlović: The role of EAN in education of young neurologists  
I. Milojević: The role of Stroke Support Organisations in Stroke Care  
B. Žvan: Thrombolysis and mechanical revascularization within Slovenian TeleStroke network  
Z. Vujković: Thrombolysis: challenges and dilemmas  
S. Butković Soldo: The role of biofeedback in neurological therapy
- 16:00-17:00**      **11<sup>th</sup> INTERNATIONAL EPILEPSY PULA SYMPOSIUM**  
**Bianca Istriana Hall**      Chairpersons: H. Hećimović & V. Demarin
- H. Hećimović: Cognitive assessment and therapy in temporal lobe epilepsy  
A. Sruk: Differentiating between seizures and nonepileptic psychogenic attacks  
V. Demarin: Epilepsy and Music
- 16:00-17:00**      **WORKSHOP – WIPEOUT BURNOUT - EMOTIONAL HYGIENE FOR HEALTH**  
**Belica Hall**      **PROFFESIONALS**
- I. Mošič
- 17:00-18:00**      **SHIRE SATELLITE SYMPOSIUM – GAUCHEROVA BOLEST \_ KAKO**  
**Bianca Istriana Hall**      **PRIDONIJETI KONAČNOJ DIJAGNOZI – OSVRT NEUROLOGA**
- V. Vuletić
- 18:00-19:30**      **POSTER SESSION**  
**Ulika Hall**      Chairpersons: K. Bechter, K. Niederkorn, O. Sinanović, I. Šain

**SATURDAY May26<sup>th</sup>, 2018**

- 09:00-11:00**      **MAIN THEME**  
**Ulika Hall**      Chairpersons: G. Deuschl & A. Korczyn & V. Demarin
- A. Korczyn: Is there free will? - A neurologist's view ?  
V. Demarin : How to prevent vascular dementia ?  
G. Deuschl: Deep brain stimulation and impulse control disorders  
V. Vuletić: Psychosocial aspects of Deep Brain Stimulation's outcome in Parkinson's disease  
N. Müller: PANDAS, Tourette's syndrome and deep brain stimulation  
M. Cuturic: Huntington's Disease: Clinical Trials Overview and Novel Treatment Options
- 11:00-12:30**      **ALZHEIMER'S DISEASE SYMPOSIUM - NEUROPSYCHIATRIC APPROACH IN**  
**Ulika Hall**      **CARE OF PEOPLE WITH ALZHEIMER'S DISEASE**
- Chairperson: N. Mimica**
- N. Mimica: Why Alzheimer's disease became World's health priority?  
F. Borovečki: Novel genomic methods in research and diagnostics of Alzheimer's disease  
N. Klepac: How to recognize Major neurocognitive disorder early?  
M. Kušan Jukić: The role of psychiatrist during the progression of Alzheimer's disease  
Discussion
- 12:30-13:15**      **ABBVIE SATELLITE SYMPOSIUM**  
**Ulika Hall**      V. Vuletić: Advanced Parkinson's disease-what is it?  
M. Trošt: The role of Duodopa in advanced PD: the experience from UMC Ljubljana

Program

- 12:30-13:15**      **LUNDBECK SATELLITE SYMPOSIUM - PONOVRNO POSTIZANJE**  
**Bianca Istriana Hall**    **FUNKCIONALNOSTI KOD DEPRESIVNIH PACIJENATA**  
 D. Marčinko: Funkcionalni oporavak kao krajni cilj u liječenju depresije  
 M. Crepulja Letica: Brintellix - omogućuje bolesnicima da se osjećaju, razmišljaju i funkcioniraju bolje - primjer iz kliničke prakse
- 13:15-14:30**      **LUNCH**
- 14:30-17:00**      **THE SPECTRUM FROM BORDERLINE PERSONALITY DISORDER TO**  
**Ulika Hall**            **PSYCHOSIS (SYMPOSIUM)**  
 Chairpersons: M. Jakovljević & D.Marčinko  
 M. Jakovljević: The concept of staging  
 D. Marčinko: The role of pathological narcissism and shame in suicidal behavior  
 M. Šagud: Pharmacotherapy of borderline personality disorder and psychosis  
 A. Savić: Psychosis spectrum concept: rethinking categorical approach  
 V.Bilić: Shame and psychological trauma  
 M. Rojnić Kuzman: Prodroms of the 1st episode psychosis  
 B. Vuksan-Ćusa: Borderline or bipolar?
- 14:30-16:30**      **STROKE SYMPOSIUM - DIAGNOSIS AND TREATMENT OF HEMORRHAGIC**  
**Bianca Istriana Hall**    **STROKE / NEUROPROTECTION**  
 Chairpersons: G. Klein & K.Niederkorn  
 T. Gattringer: Intracerebral Hemorrhage  
 D. Staykov: Intraventricular Hemorrhage  
 M. Mokry: Neurosurgical Aspects  
 A. Tsiskaridze: Intracerebral hemorrhage and atrial fibrillation  
 S. Gajović: Molecular imaging of brain repair after ischemic lesion  
 A. Czlonkowska: Neuroprotection in stroke
- 16:30-17:30**      **NEUROSONOLOGY WORKSHOP**  
**Bianca Istriana Hall**    Chairpersons: V. Demarin & M. Mijalović  
 V. Demarin: Vascular ultrasound of brain and neck  
 V. Džajic: Asymptomatic carotid disease  
 M. Mijalović: Transcranial ultrasound of brain parenchyma and clinical applications  
 S. Morović: Functional TCD  
 H. Budinčević: The role of ultrasound in intensive care unit
- 16:30-17:45**      **WORKSHOP: HOW TO READ AND WRITE A PAPER**  
**Belica Hall**            A. Glasnović
- 17:00-18:30**      **YOUNG PSYCHIATRISTS SYMPOSIUM: THE ROLE OF PSYCHOLOGICAL**  
**Ulika Hall**            **FACTORS IN PSYCHOPHARMACOTHERAPY**  
 Chairpersons: V. Bilić & D.Marčinko  
 D.Marčinko & V.Bilić: Psychodynamic of psychopharmacotherapy  
 D. Rudan: A case report (with supervision)  
 Discussion

Program

- 17:30-20:15**      **STUDENTS' SYMPOSIUM**  
**Belica Hall**      Chairpersons: F. Đerke & S. Gašpar  
F. Đerke: Making Data Meaningful  
N. Ibishi: Preclinical stage of Alzheimer's disease- future considerations  
L. Filipović-Grčić: Watch your Brain Project  
N. Benjak: Epilepsy and pregnancy  
D. K. Rudež: 14<sup>th</sup> Croatian Student Summit  
I. Franin: Student scientific activities at the Faculty of Medicine and University of Rijeka Students' Council  
S. Gašpar: Public health web site "Pitaj Andriju"  
A. Juginović: Practical Knowledge for Students: a unique International Conference in Split, Croatia

**SUNDAY, May 27<sup>th</sup>, 2018**

**09:00-10:00**      **BEST POSTERS AWARDS PRESENTATIONS**

**Ulika Hall**      Chairpersons: V. Demarin & F. Benedetti

**10:00-12:00**      **JOINT MEETING WITH ALPS-ADRIA NEUROSCIENCE SECTION AND**  
**Ulika Hall**      **CENTRAL AND EASTERN EUROPEAN STROKE SOCIETY AND WFN**  
**APPLIED RESEARCH GROUP ON THE ORGANIZATION AND DELIVERY OF**  
**CARE**

Chairpersons: L. Battistin & V. Demarin

A. Glasnović: RANKL axis in brain pathology

S. Tomasović: Epidemiology of pharmacological treatment of multiple sclerosis in Croatia

M. Zupan: Cognitive impairment in a small cohort of patients with ischemic leukoaraiosis: a pilot study

S. Miljković: Thrombolysis in Banja Luka

V. Govori: Risk factors for stroke in Kosovo

B. Aleksovski: Evaluation of the role and interactions among peripheral biochemical markers in depression and intracerebral hemorrhage: state biomarkers, prognostic factors and modeling of the outcomes in clinical decision making

**12:00-12:30**      **CLOSING CEREMONY**

**Ulika Hall**

**ACADEMIC LECTURE****Kjell Fuxe, Malgorzata Filip, Dasiel O. Borroto-Escuela (Stockholm, Sweden): A2AR-D2R heteroreceptor complexes, mental disorders and their treatment**

**Introduction/Objectives:** The concept of allosteric receptor–receptor interactions in G protein-coupled receptor (GPCR) homo- and heteroreceptor complexes of the brain gave a new biological principle to understand brain integration and communication at the molecular level. Allosteric receptor–receptor interactions, made possible through receptor oligomerization, led to rapid changes in their receptor recognition, pharmacology, signaling and trafficking. GPCR heteroreceptor complexes can also involve ligand gated ion channel receptors, receptor tyrosine kinases (RTKs), sets of GPCR and G protein interacting proteins, ion channels and/or transmitter transporters. Our novel understanding of the molecular organization of the receptor oligomers, their allosteric communication and the features of their receptor interface gives a new dimension to molecular neuroscience.

**Participants, Materials/Methods:** Molecular assessment. A2AR-D2R heteroreceptor complexes were evaluated in dorsal striatum and nucleus accumbens using in situ proximity ligation assay, immunohistochemistry and Co-immunoprecipitation in rat cocaine self-administration and/or pharmacological treatments and in rat models of schizophrenia (amphetamine induced sensitized state). The A2AR-D2R heteroreceptor complexes were studied for changes in their D2R binding characteristics produced by activation of the A2AR protomer via the allosteric receptor–receptor interactions, using biochemical binding techniques.

**Results:** Dysfunction or disruption of the A2AR-D2R heteroreceptor complexes can lead to brain disease. Understanding the D2R heteroreceptor complexes and their dysfunction in schizophrenia can lead to new strategies for its treatment and for avoiding side-effects of antipsychotics known to mainly act as D2R antagonists. The A2AR-D2R heteroreceptor complexes in the ventral striato-pallidal anti-reward GABA pathway modulated the brain circuit to the prefrontal cortex. Through A2AR activation the A2AR protomer may inhibit overactivated D2R signaling in schizophrenia and restore the glutamate drive to the prefrontal cortex, which can lead to anti-psychotic effects. The A2AR agonist is established as an atypical anti-psychotic drug. Cocaine self-administration activated antagonistic A2AR-D2R interactions in the nucleus accumbens. With PLA cocaine self-administration also increased the A2AR-D2R and D2R-sigma1R heteroreceptor complexes in the nucleus shell. Disruption of the A2AR-D2R heteroreceptor complexes with intra-accumbal A2AR transmembrane 5 peptide administration enhanced cocaine self-administration.

**Conclusions:** Understanding the A2AR-D2R heteroreceptor complexes and their dysfunction in schizophrenia can lead to new strategies for its treatment and for avoiding side-effects of antipsychotics known to mainly act as D2R antagonists. This includes a way to optimize combined treatment or single use of heterobivalent drugs targeting distinct D2R heteroreceptor complexes in schizophrenia. A2AR-D2R heteroreceptor complexes in the anti-reward GABA pathways from the nucleus accumbens have become exciting new targets for treatment of substance use disorder. The changes found in these receptor complexes in cocaine self-administration opens up a new understanding what goes wrong in cocaine addiction, which may be linked to the dysfunction of the A2AR-D2R heteroreceptor complex.

**MAIN THEMES LECTURES****Franz Fazekas (Graz, Austria): 2017 Revisions of the McDonalds criteria: What is new and where are we heading to?**

Since their introduction in 2001 the so-called „McDonald Criteria“ have a well established place in the work-up of patients with suspected multiple sclerosis (MS). This comes from their goal to harmonize MS diagnosis by a common understanding how to use paraclinical techniques - at present most prominently MRI - to satisfy the criteria for a disease which typically occurs disseminated in time and in space, i.e in the central nervous system. Unfortunately it is often overlooked that the McDonald criteria are not intended to serve differential diagnostic purposes per se and should be applied only to patients with symptoms suggestive of MS which cannot be explained by another disorder. Focusing on MRI the MAGNIMS group has just provided an excellent overview on the many imaging mimics of MS which we need to consider and how to separate them (Geraldes R, et al., Nature Reviews Neurology 2018). To some extent diagnostic certainty can nevertheless also be strengthened by incorporating features into the criteria which are quite specific for MS. This has happened in the recent revision by allowing to substitute the evidence for dissemination in time by the presence of CSF-specific oligoclonal bands (Thompson AL et al., Lancet Neurol 2017). A simplification (presumably without loss of specificity) comes from the modification that symptomatic lesions can be used to demonstrate dissemination in space or time in patients with supratentorial, infratentorial, or spinal cord syndrome and the consideration of cortical lesions together with juxtacortical lesions. Altogether the „2017 Revisions“ appear to have found a good balance between desirable maxima of sensitivity and specificity for an early diagnosis of MS but the McDonald Criteria still do not replace the need for a careful differential diagnostic thinking.

**E. Koutsouraki, T. Kalatha, Th. Koukoulidis, M. Arnaoutoglou, V. Costa, S. Baloyannis (Thessaloniki, Greece): Cognitive impairment in Greek multiple sclerosis patients**

**Introduction/Objectives:** Cognitive impairment is a common phenomenon in multiple sclerosis (MS), occurring at all stages of the disease, even at the earliest, and can be a major source of disability, social impairment, and impoverished quality of life. Cognitive dysfunction is mainly focused on working memory, conceptual reasoning, verbal fluency, speed of information processing, attention and executive function. Additional clinical factors, including disease course, fatigue and affective disturbance, can impact the degree of MS-related cognitive impairment.

**Participants, Materials/Methods:** Forty patients diagnosed with definite MS according to I. McDonald et al. criteria were administered the Mini-Mental State Examination (MMSE) and a comprehensive battery of neuropsychological tests. A total of 20 non-neurologically impaired participants, matched for gender, age and education, formed a control group. We tried to correlate the cognitive impairment with the type of the disease, duration, disability according to Expanded Disability Status Scale and treatment type. Possible confounders, like fatigue, pain and depression were also assessed.

**Results:** Most of the patients of the present study revealed mild cognitive impairment with mild influence on the everyday function. We found weak correlation between cognitive deficit and the duration of MS, as well as the physical disability status and moderate correlation between cognitive impairment and the type of the disease as well as MRI findings (atrophy and lesion load).

**Conclusions:** Cognitive impairment in MS seems to be not simply the result of tissue destruction, but also a balance between tissue destruction, tissue repair and adaptive functional reorganization. These findings highlight the need to screen for cognitive deficits in MS patients to conduct potential cognitive rehabilitation intervention.

**Domagoj Vidović, Petrana Brečić (Zagreb, Croatia): The new insights in relationship between depression and pain**

Depression is highly prevalent mental disorder which is frequently presented with somatic symptoms. It is known for long that pain and depression are closely related. Quite often they make vicious circle in which pain worsens symptoms of depression and depression worsens feeling of pain. Many referred patients have unexplained physical symptoms like back pain or headaches which can be first symptoms of depression. We would like to put new light on this connection.

**Osman Sinanović (Tuzla, BiH): Tinnitus in neurological practice**

Tinnitus (or “ringing in the ears”) is the presence of sound heard in the absence of an external sound source, localized to either ear or throughout the head, and usually results from: (a) auditory system (usually peripheral, rarely central); (b) somatosensory system (head and neck); or (c) a combination of the two. Its cause can be determined through its characteristics. The history must include the quality of tinnitus (including whether it can ever be pulsatile or have a clicking component); location; variability; predominant pitch (low or high); and whether the patient can do something to modulate the percept. Epidemiological studies estimate that there are more than 50 million Americans who experience tinnitus and, of these, 10% to 15% have tinnitus that warrants medical evaluation. The prevalence of severe tinnitus varies from 1.5% to 6.9% (15% of the adult population) depending on the definition applied. Chronic tinnitus (tinnitus that lasts more than 6 months) is often associated with other comorbidities, including insomnia, anxiety and depression, which contribute to its impact on quality of life. Tinnitus can greatly disrupt sleep patterns, relaxation times, and concentration. Stress almost invariably makes tinnitus worse, but experience of chronic tinnitus is also stress producing, so it can be a self-perpetuating problem. Recent research has shown that tinnitus is not simply an ear problem, but a neurological condition. Tinnitus can also occur in association with anxiety or depression and with dysfunctions of the cervical spine or temporomandibular joint. In these last two cases, tinnitus can be elicited by the somatosensory system of the cervical spine or temporomandibular area. This type of tinnitus is called somatic tinnitus and has been described in 36–43% of a population with subjective tinnitus. Current thinking is that tinnitus involves the normal background neural activity in the hearing system or “internal noise” which is always present but not usually noticeable because normal hearing ensures that external sounds are louder than this internal noise. Hearing loss disturbs that natural balance, “uncovering” the internal noise. Even though tinnitus is relatively common and affects quality of life, historically some clinicians have thrown up their hands when confronted with the challenges of treating it. After all, tinnitus is not a disease, but rather a symptom that can result from multiple conditions affecting the auditory system, which includes the ear, the auditory nerve that connects the inner ear to the brain, and the parts of the brain that process sound. About 20% of adults who experience tinnitus will require clinical intervention. Not a disease in and of itself, tinnitus is actually a symptom that can be associated with multiple causes and aggravating co-factors. Tinnitus is relatively common, but in rare cases it can be a symptom of serious disease such as vascular tumor or vestibular schwannoma (VS). Tinnitus can occur on one or both sides of the head and can be perceived as coming from within or outside the head. Tinnitus most often occurs in the setting of concomitant sensorineural hearing loss (SNHL), particularly among patients with bothersome tinnitus and no obvious ear pathology. Most tinnitus is subjective, perceived only by the patient. In contrast, objective tinnitus can be perceived by others, is rare, and is not the focus of this guideline. Primary tinnitus is used to describe tinnitus that is idiopathic and may or may not be associated with SNHL. Although there is currently no cure for primary tinnitus, a wide range of therapies has been used and studied in attempts to provide symptomatic relief. These therapies include education and counseling, auditory therapies that include hearing aids and specific forms of sound therapy, cognitive behavioral therapy, medications, dietary changes and supplements, acupuncture, and transcranial magnetic stimulation. Secondary tinnitus is tinnitus that is associated with a specific underlying cause (other than SNHL) or an identifiable organic condition. It is a symptom of a range of auditory and nonauditory system disorders that include simple cerumen impaction of the external auditory canal, middle ear diseases such as otosclerosis or Eustachian tube dysfunction, cochlear abnormalities such as Ménière’s disease, and auditory nerve pathology such as VS. Nonauditory system disorders that can cause tinnitus include vascular anomalies, myoclonus, and intracranial hypertension. Management of secondary tinnitus is targeted toward identification and treatment of the specific underlying condition and is not the focus of this guideline.

**Karl Bechter (Ulm, Germany): Chronic tinnitus and psychopathologic comorbidities**

**Introduction/Objectives:** Tinnitus is of heterogenic etiology. Known risk factors are many. Here the role of cervicogenic tinnitus is focused on.

**Participants, Materials/Methods:** From personal experiences with chronic vertigo and tinnitus the lieterature search showed a potential underscored role of cervical tension. Respective effective treatments match with such idea. A specific role of upper posterior muscles of the cranio-cervical transition were tested in treatment and an alternative Explanation by measuring cerebral blood flow with ultrasound methods during head manoeuvres.

**Results:** Literature including search for mechanisms and for improved treatments and own treatment experiences and experiments support the view of an underscored role of cervical tension in a large subgroup of tinnitus.

**Conclusions:** Tinnitus Research should more focus on cervical etiologies. The hypothesis of a specific role of upper posterior head-neck muscles (experimentally shown to exclusively, directly and widely signaling into the brain) should be specifically explored.

**Vida Demarin (Zagreb, Croatia): How to prevent vascular dementia?**

Aging is often associated with some cognitive impairment. Greater population life expectancy is one explanation for increased incidence of cognitive impairment cases. A large number of people with cognitive impairment and dementia is becoming one of the most important medical and social problems worldwide. Therefore, prevention of cognitive impairment is an imperative. Dementia includes a heterogeneous group of disorders, the most common being Alzheimer's dementia (AD) and vascular dementia (VD). Because cerebrovascular disease can cause mild cognitive deficits that affect multiple cognitive functions, the term 'vascular' mild cognitive impairment (VaMCI) was proposed. Patients diagnosed with VaMCI are in transition towards Alzheimer's disease. Vascular cognitive impairment (VCI) encompasses all cognitive disorders associated with cerebrovascular disease, from developed mild cognitive deficits to dementia. VCI is a syndrome with evidence of clinical stroke or subclinical vascular brain injury, and cognitive impairment affecting at least one cognitive domain. The most severe form of VCI is VaD.

Most cardiovascular risk factors, such as arterial hypertension, diabetes mellitus, hypercholesterolemia, atrial fibrillation, and smoking are not exclusively risk factors for VD, but also for AD. Early changes in the blood vessel wall can be detected by early ultrasound screening methods which allow us to detect changes before the disease becomes clinically evident. Early disease detection enables in-time management, and studies have shown that careful control of vascular risk factors can postpone or even reverse disease progression.

Results of recent studies have shown that one third of dementia may be preventable with lifestyle change pointing out the necessity for being ambitious about prevention.

**Vladimira Vuletić (Rijeka, Croatia): Psychosocial aspects of Deep Brain Stimulation's outcome in Parkinson's disease**

**Introduction/Objectives:** Deep brain stimulations (DBS) have been proven by many studies as an efficient and safe treatment of Parkinson's disease (PD) for the last 30 years with good effect on quality of life and control of movements. Although, PD patients have been told before the operations that DBS is not stopping the disease and will not cure them, we can sometimes see their unrealistic expectations after DBS.

**Participants, Materials/Methods:** Besides that, patients can express difficulty adjusting from being chronically ill with certain roll in family and society to their new status as independent with better movements' control, becoming almost „normal“ and taking a new roll in their family and society. (The same or different roll then before the disease's onset).

**Results:** This postoperative response adjustment has been described in the literature on epilepsy as the 'Burden of Normality' (BoN) syndrome where successfully 'treated' individuals might experience difficulties in adjusting to becoming 'normal', 'treated' or 'seizure free'. Nowadays is a similar situation with some DBS patients. So far we paid our attention and discussed about DBS abnormal side effects caused by the intervention (hypersexuality, hypomania, depression, apathy, etc.).

**Conclusions:** In this lecture, this new postoperative problem will be presented and why are sometimes doctors (neurologist and neurosurgeons) satisfy with good DBS effects on motor and nonmotor symptoms but patients with PD is not and what is a roll of psychosocial adjustment process in BoN syndrome as a postoperative self-change response.

**Miroslav Čuturić (Columbia, USA): Huntington's Disease: Clinical Trials Overview and Novel Treatment Options**

**Introduction/Objectives:** In this presentation we overview clinical trials in Huntington's Disease (HD) and their implications in the context of other psychiatric and neurodegenerative disorders. We also discuss future directions for successful clinical trials and new treatment options in HD.

**Participants, Materials/Methods:** Review of literature and clinical trials database.

**Results:** Over the last fifteen years, one hundred clinical trials have been completed in HD, evaluating 41 compounds and 11 non-pharmacological interventions, including cell therapies, for possible therapeutic effects, with an overall very low success rate at 3.5 percent. The most significant outcomes were the two USFDA approvals for tetrabenazine and deuterabenazine for the treatment of chorea.

**Conclusions:** To date, the most promising advances in HD research have been accomplished in the field of gene therapy. In an autosomal dominant disorder such as HD, silencing the mutant gene may potentially have a curative effect. The main principles in gene silencing include repression on transcription of DNA information into messenger RNA by using zinc finger proteins, repression of translation of mutant huntingtin by antisense oligonucleotides, and blocking protein translation by RNA interference techniques. A phase one clinical trial evaluating the safety of gene silencing therapy in HD in humans, has been successfully completed in October 2017. As the HD gene mutation can be identified decades before disease onset, the ultimate aim of therapy would be to delay the onset of the disease or possibly completely prevent it from emerging.

**Norbert Müller (Munich, Germany): PANDAS, Tourette's syndrome and deep brain stimulation**

Tourette's syndrome is a tic disorder, in which dopaminergic neurotransmission is involved. Dopamine receptor blocking drugs are effective, although the pathophysiological mechanism is still unclear – in part a chronic or waxing and waning course might be due to infection or an immune process seems to be involved and a broad overlap with PANDAS syndrome is observed. First results of the European-wide EMTICS (European Multicenter Tics in Children Study) will be presented, with a special emphasis on comorbid obsessive-compulsive symptoms. PANDAS (Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infection) is a disease related to streptococcal infection and tics and/or obsessive-compulsive symptoms (OCD-symptoms). The exact pathogenic mechanisms are still unclear. In parallel to the pathophysiological model of Sydenham's Chorea a pivotal role for autoantibodies has been postulated. However, not only an autoimmune process, but also acute and chronic infections triggering the exacerbation of tics and OCD were observed. While dopamine receptor blocking drugs are first choice in the therapy of Tourette's syndrome (TS), immune modulating treatment is the first choice in PANDAS. In treatment resistant TS, deep brain stimulation (DBS) is an interesting experimental therapeutic approach. The results of a cohort of patients treated with DBS are presented.

**LECTURES****PSYCHOPATHOLOGY SUMMER SCHOOL****Margherita Bechi (Milano, Italy): Family stress and social cognition in schizophrenia**

**Introduction/Objectives:** Patients with schizophrenia exhibit deficits in multiple areas of daily functioning, which constitute one of the most disabling features of the disorder. Neurocognitive and socio-cognitive impairments represent key features of the disease, leading patients to avoid interactions with the environment, thus negatively influencing functional outcome. Despite the high prevalence of cognitive impairment among patients with schizophrenia, its distribution is characterized by great heterogeneity that have been described by both quantitative and qualitative models. It has been hypothesized a direct relationship between cognitive and functional variabilities among patients, however the role of neurocognition and social cognition still need to be better clarified. Noteworthy, recent literature focused on the effect of early environment's features on patients' neurobiological and cognitive development, and different innovative theoretic models were proposed. For example, according to the Traumagenic Neurodevelopmental Model, abnormalities in psychotic disorders could be due to maltreatment-related alterations. More specifically, early (i.e., intrafamilial) abuse might influence the development of key cognitive abilities (e.g., memory, attention), as well as higher cognitive domains (e.g., social cognition) during adolescence. In addition, such processes might overlap with stress-sensitive periods for hippocampus and prefrontal cortex development, with a direct impact on gene-environment interactions. In other words, within-subjects variance in cognitive abilities (and thus, in functional outcome) might be partially explained by the type and timing of adverse childhood experiences patients experienced. However, although the role of several family-related environmental factors (e.g., low social support, poor parental bonding, neglect, violence and/or abuse) was considered, conflicting findings emerged concerning the relationship between family stress and functioning.

**Participants, Materials/Methods:** The present study thus aims at investigating the role of parental bonding and violent behaviors on psychopathological, neurocognitive and functional status in a sample of 140 patients with schizophrenia.

**Results:** Our findings point out different profiles of socio-cognitive abilities among patients who experienced different types of parental bonding (i.e., good or bad parenting), as well as different profiles of Theory of Mind abilities among patients who experienced highly violent family environments. Furthermore, such profiles are associated to different functional outcomes, as indicated by results concerning quality of life.

**Conclusions:** Collectively, our findings could lead to intriguing implications involving both research and clinical settings (i.e., innovative models of schizophrenia pathology and more tailored treatments).

**Martin Brüne (Bochum, Germany): Childhood Trauma interacts with OXTR genes Variation and pain empathy**

**Introduction/Objectives:** A wealth of studies has associated genetic variation of the oxytocin receptor with individual differences in human social behaviour. Specifically, in a non-clinical sample homozygous carriers of the G allele of the single nucleotide polymorphism rs53576 have been reported to display more trust, empathy and prosocial behavior and were less sensitive towards stress and maltreatment during childhood when compared to A-allele carriers.

**Participants, Materials/Methods:** In the present study we investigated whether childhood trauma, as assessed by the Childhood Trauma Questionnaire (CTQ), affects empathy for somatic and psychological pain, and how this is moderated by genotype, in a sample of 302 individuals (148 of whom were diagnosed with BPD).

**Results:** We found a moderating effect of genotype on the impact of childhood trauma on empathy for psychological pain, independent of diagnosis. Put another way, the positive correlation of CTQ scores and empathy appeared only in A-allele carriers (GA + AA), but not in GG carriers.

**Conclusions:** These results suggest that A-allele carriers are more sensitive towards early maltreatment and that maltreatment affects empathy for another's psychological pain.

Lectures

**Carla Schubert (Helsinki, Finland): Psychotherapy in refugees with complex PTSD – cultural differences and preconceptions**

Psychological treatment for traumatized refugees settling in Western countries is considered complex and demanding, with a high number of drop-out rates. Research identifying elements that make psychotherapy universally applicable and effective, are of importance. Further, variations and differences in cultural factors influence mental health treatment and psychotherapy in a number of ways and – for a development of better healthcare services - deserve more attention. Two case studies are presented.

**Giulia Agostini (Milano, Italy): Cognitive and social dysfunction in schizophrenia: role of premorbid adjustment**

**Introduction/Objectives:** Premorbid adjustment (PA) is a multidimensional concept, which has been defined as the functioning in educational, occupational, social and interpersonal relation areas before the onset of schizophrenia. Premorbid dysfunction during childhood and adolescence is well documented in patients affected by schizophrenia and it has been related to earlier illness onset, worse prognosis, a higher severity of negative symptoms as well as functional outcome, since the impairment of premorbid functioning affects the ages in which the skills necessary to develop educational, occupational and social abilities are normally acquired and exercised. Despite the numerous evidences of a widespread deficit of PA in schizophrenia, numerous studies pointed out multiple premorbid paths, suggesting that schizophrenia's heterogeneity begins early, long before the onset. Studies differentiated three subgroups of patients, based on PA: a good-stable group, characterized by people with a developmental history relatively free of problems in PA, a group having a “deteriorating” PA, i.e. subjects with good adjustment in childhood that become increasingly problematic until the onset of schizophrenia, and lastly a stable-poor dysfunction group, made up of subjects with widespread functional impairment since childhood. These groups differ not only with regard to premorbid characteristics but also for cognition, symptoms, and functioning after onset. However, no study has evaluated differences between paths about Theory of Mind (ToM). Recent researches identified a group of individuals with schizophrenia that presents neurodevelopmental abnormalities typical for Autism Spectrum Disorder, such as difficulties in social interaction, communication, emotion processing and motor abnormalities. It could be hypothesized that this subgroup of patients with autistic phenotypes may coincide with the stable-poor PA group.

**Participants, Materials/Methods:** The present study aims to investigate differences between different paths of PA on psychopathology, neurocognition and Social Cognition in a sample of 98 patients with schizophrenia. Furthermore this study aims to evaluate if poor PA group presents autistic phenotypes.

**Results:** By means of cluster analysis, we identified three paths based on PA (good-stable, “deteriorated” and poor-stable groups). Results show differences between groups as regards neurocognition and ToM. Furthermore the stable-poor group shows differences in autistic behaviors compared to the other paths.

**Conclusions:** This study confirm previous data about the heterogeneity of PA, neurocognition and ToM and led to intriguing implications involving the presence of autistic phenotypes in a subgroup of patients affected by schizophrenia.

Lectures

**Carla Schubert (Helsinki, Finland): Ethical aspects in the (mental) health treatment of refugees with PTSD**

A part of the refugees seeking asylum in Western countries are torture survivors. A history of torture can lead to complex psychological and somatic sequelae which are often not identified as such. Especially asylum seekers experience barriers in the access to health care while they show complex psychological and medical problems. In the evaluation of the culturally diverse patient and the provision of care the ethics and professional methods of medical personnel play a critical role. Contributing factors, including inadequate and insufficient provider training, varying and inadequate institutional commitment are discussed. Further, proposals for better healthcare for this group of patients will be presented.

Lectures

**Trpimir Glavina, Marija Žuljan Cvitanović, Duška Krnić, Romilda Roje, Iris Stipetić (Split, Croatia): The special features of emergency reception of depressive disorders at the University hospital centre Split Psychiatric Clinic**

There is no doubt that predictions about the rise of depressive states worldwide are confirmed, as evidenced by exact data and from our socioculture. Due to the reason structure and diagnosis for emergency hospitalization at the University hospital centre Split Psychiatric Clinic, the share of depressive and suicidal conditions has increased significantly in the last 5 years. In this lecture, we discuss the possible outcomes of such phenomena and the dynamics of treatment in our environment and an institution whose relatively few people in the mental health care system are helping and working under extraordinary burdens.

**THE SPECTRUM FROM BORDERLINE PERSONALITY DISORDER TO PSYCHOSIS (SYMPOSIUM)****Darko Marčinko (Zagreb, Croatia): The role of pathological narcissism and shame in suicidal behavior**

**Introduction/Objectives:** The objective of our investigation is to investigate possible relationship between pathological narcissism and suicidal behavior related to the complex emotion of shame that is divided into subcategory. Our study examined the relationships between pathological narcissism, shame and suicidal symptoms in psychiatric outpatients. Consistent with earlier investigations (Ellison et al., 2013; Marčinko, Jakšić et al., 2014), pathological narcissism exhibited a stronger relationship with acute mental distress manifested as suicidal symptoms. Body and character shame proved to be a significant mediators of this association, while the mediating effect of behavior shame was not confirmed.

**Participants, Materials/Methods:** This investigation also addresses how and why a shame can generate an internal subjective experience that evokes a suicidal behavior in individuals with pronounced pathological narcissism. Narcissistic rage and shame-based aggression can lead to suicide if turned against the self. Kernberg described suicide associated with malignant narcissism as a vehicle of omnipotent wishes for sadistic control. Shame is the veiled companion or underside of narcissism (Morrison, 1987). Inability to express shame is important factor of vulnerable ego and frequently related to pathological narcissism. Reluctance or inability to share feelings and thoughts of shame with others can force loneliness and isolation and predispose the suicidal process.

**Results:** Our results should be explained by the facts that pathological narcissism accompanied by body and character shame led to affective dysfunction, manifested as depression which can lead to suicidal behavior. Trumbull (2003) suggested shame to be an acute stress response to interpersonal traumatization. In this way, shame can mobilize depressive symptoms, narcissistic rage, and suicidal behavior. According to Ronningstam et al. (2008), some of shame-based aggression was triggered by loss of pride and humiliation with decreased reparation of broken narcissism. Suicide is a way to reassert pride and reclaim control in narcissistic patients. Envy (frequently presented in narcissistic patients) may lead to shame as it implies inferiority of the subject and superiority of the object of envy. Lansky (2005) notes that shame emphasizes weakness, vulnerability, and the likelihood of rejection— so much so that its acknowledgment often generates more shame which frequently leads to suicidality. Our results confirmed theory of Lansky, that tolerance of shame goes beyond tolerance of the pain of the affect per se and should be considered also as unbearable mortification and a signal of incipient social annihilation and auto-destruction.

**Conclusions:** Regarding clinical implications of our results we may emphatically or intuitively detect and clarify shame and label it as such, which may be helpful when working with difficult patients such as narcissistic or suicidal. Assessing the risk of suicide in narcissistic patients can be challenging for the clinician. In series of book published by Medicinska naklada (Suicidology, 2011; Narcissistic Personality Disorder: Diagnostic Contribution, 2013; Eating Disorders: From Understanding to Treatment, 2013; From Violence to Dialogue, 2014; Mourning, 2014; Personality Disorders: Real People, Real Problems, 2015; Psychoanalytic Models of Communications, 2016; Hysteria, 2017; Civilization and Its Discontents in 21st Century- psychodynamic approach), our team emphasized the link between psychopathology of personality with different and difficult personality and eating disorders patients.

**Marina Šagud, Alma Mihaljević Peleš, Bjanka Vuksan-Ćusa (Zagreb, Croatia): Pharmacotherapy of borderline personality disorder and psychosis**

**Introduction/Objectives:** Second-generation antipsychotics are increasingly prescribed in patients with borderline personality disorder (BPD) worldwide. The aim of this presentation is to summarize the current knowledge regarding the treatment with antipsychotics in patients with BPD.

**Participants, Materials/Methods:** Literature search was conducted.

**Results:** Antipsychotics are used in BPD in two clinical conditions. Firstly, co-occurring borderline personality disorder (BPD) is prevalent in first-episode psychosis and schizophrenia. While antipsychotics are the cornerstone of treatment for schizophrenia-spectrum disorders, the presence of BPD might require the modification of this treatment. Namely, patients with both disorders had more severe clinical presentation in terms of higher risk of suicidal and violent behavior. Secondly, antipsychotics are not first-line treatment for patients with BPD and no drug is registered for the use in BPD. However, such individuals often present with short-term psychotic symptoms, dysphoria, impulsivity, aggression and anger and could benefit from the treatment with antipsychotics. Antipsychotics which might reduce the aforementioned symptoms include aripiprazole, haloperidol, olanzapine, quetiapine XR and ziprasidone. There is also evidence that clozapine reduces self-harm and suicidality. Polypharmacy is common in those patients.

**Conclusions:** While psychotherapy is first-line treatment for BPD, antipsychotics might be used to relieve specific symptoms. However, they should be used by caution. Given the frequent comorbidity of BD and psychosis, worse clinical course and the lack of evidence-based treatment approach, randomized clinical studies followed by development of treatment guidelines for this specific population is urgently needed.

**Aleksandar Savić (Zagreb, Croatia): Psychosis spectrum concept: rethinking categorical approach**

**Introduction/Objectives:** Since its beginning, psychiatry (and indeed most of medicine) has depended upon categorical approach in both clinical work and research. Categories used have changed over time or disappeared altogether, but we continue to fight even today with validity of what remains, which hinders progress on multiple levels. Both biological and psychological approaches to explaining complex mental disorders indicate the problems with existing categories (i.e. similar underlying biology for schizophrenia and bipolar disorder), which helped give rise to dimensional conceptualizations.

**Participants, Materials/Methods:** Overview of research in the field showing overlap between different psychiatric disorders will help in understanding emergence of different spectra, and opportunities and issues associated with those emergent concepts.

**Results:** One of the concepts that emerged was that of a psychosis spectrum, slowly outgrowing initial schizophrenia spectrum, and cutting across a number of different disorders. Understanding psychotic phenomena on a spectrum allowed an insight into sub-threshold experiences in non-patient populations, as well as in populations of different disorders (i.e. personality disorders), which opened up a discussion on early interventions and cross-diagnostic therapeutic interventions, and informed further research in the field. One of the ways concept of dimensions is strengthened and furthered is through Research Domain Criteria project, which, as was stated in NIMH's strategic plan, aims at finding "new ways of classifying mental disorders based on dimensions of observable behavior and neurobiological measures".

**Conclusions:** Even though it seems in the end we might be destined to operate in the world of discrete categories for administrative but also practical clinical purposes, concept of spectra will allow those categories to be more in line with patient's psychology and neurobiology, and allow clinicians to approach patients with more realistic concepts and therapeutic plans in mind.

**Martina Rojnić Kuzman (Zagreb, Croatia): Prodroms of the 1st episode psychosis**

Schizophrenia is one of the most difficult psychiatric illnesses, in terms of diagnosis, prognosis as well as treatment. It is a fairly heterogeneous illness, but in the majority of patients it has a recurrent course, characterized by alternating periods of acute psychotic illness and their remission. However, studies have shown that in some of the patients who develop schizophrenia afterwards, there are signs prior to the onset of first psychosis. Some of the signs are present from the childhood and some progress in the prodromal phase of the illness. The prodromal phase of the illness is characterized by non specific subclinical symptoms, but there are also other features which are developed as early as in prodromal state. These include subtle neurocognitive deficits, alteration of stress response, different patterns of activation on magnetic resonance scanning, etc. These observations led to the development of early detection and intervention services around the world which target persons in their prodromal state of illness with the intention to postpone or even abolish the development of the first psychosis. In this report, symptoms and signs of prodromal phase will be presented, and available treatment options and their effectiveness will be discussed in light of results of the present studies.

Lectures

**Bjanka Vuksan-Ćusa (Zagreb, Croatia): Borderline or bipolar?**

Bipolar disorder and borderline personality disorder are common psychiatric diagnoses. One is a mood disorder with a strong genetic basis while the other is a disorder of personality commonly related to abusive experiences in childhood. Despite contrasting aetiologies they can be difficult to differentiate because of overlapping clinical presentations and symptoms. The hypothesis that many mental disorders fall within a bipolar spectrum, and that the mood instability that characterizes borderline personality disorder puts it into this spectrum is critically reviewed. Diagnostic accuracy is important because of their polarised treatment approaches: long term treatment with mood stabilizers for bipolar disorder and psychotherapy for borderline personality disorder.

**CENTRAL AND EASTERN EUROPEAN STROKE SOCIETY SYMPOSIUM****Bojana Žvan (Ljubljana, Slovenia): Thrombolysis and mechanical revascularization within Slovenian TeleStroke network**

**Introduction/Objectives:** The Slovenian national telestroke network “TeleKap” has been established with the aim of optimizing acute stroke (AS) care in Slovenia. It is covering the entire nation. To the best of our knowledge, this is the first functioning national telestroke network behind the former iron curtain in Europe. We present and discuss the results of the TeleKap network with special emphasis on intravenous thrombolysis (IT) and mechanical revascularization (MeR) rates in acute ischemic stroke (AIS) patients during the first three operative years, and suggest possible improvements that would help optimize the network.

**Participants, Materials/Methods:** Retrospectively, the results of treatment with IT and MeR in 1972 patients were redefined from the TeleKap register.

**Results:** The number of patients treated has been increasing. Whereas in the last quarter of 2014 we examined 88 patients, up to 250 patients per quarter were examined in 2017. There were 1181 patients (59%) with acute ischemic stroke. Of them, 461 (39%) received intravenous IT, while in 77 patients (47 male, 30 female, average age 68.45 years) were performed MeR. 51 MeR patients (66.23%) received IT in the course of treatment, 26 patients (33.77%) suffered from atrial fibrillation and 7 patients (9.09%) had died during the course of treatment. The average treatment delay regarding IT in general hospitals (GH) was shortest in 2015 (door-to-needle time (DNT) 68 minutes). In 2017, average DNT extended to 70 minutes. After initial consultation, 87% of patients remained in network hospitals, while all MeR patients were transferred to the University Medical Centre Ljubljana (UMCL), where they were treated. From 45% to 55% of IT patients had favorable outcome at discharge defined as modified Rankin Score (mRS) of 0-2. MeR patients had their mRS evaluation value measured at 3 or more at the admission to the hospital. At the discharge 29.87% (23/77) patients had their mRS evaluation value remeasured at 0, 1 or 2.

**Conclusions:** In accordance with results from the study we have concluded that IT and MeR represent a successful way of treatment of stroke patients. Considering the fact that all patients were members of the TeleKap network we have also concluded that they were granted swift treatment with systemic fibrinolysis and/or mechanical revascularization at the UMCL. The TeleKap network could serve as a model of stroke care for other so called Eastern European countries.

**ALZHEIMER'S DISEASE SYMPOSIUM - NEUROPSYCHIATRIC APPROACH IN CARE OF PEOPLE WITH ALZHEIMER'S DISEASE****Ninoslav Mimica (Zagreb, Croatia): Why Alzheimer's disease became World's health priority?**

There is no doubt that Alzheimer's disease (AD) is today the World's health priority, but It was not always like this. Although this disease exists always in humans, it was uncommon e. g. rare. Namely, the early onset form was as much present as it is today, and very young cases of AD were rare the same as there are today. What is the difference - the disease is now much more evident in older people, among oldest old and more present in women due to the fact that they live substantially longer. Today we observe the link between females and dementia due to longevity, but also there is a link between carers who are more common females according to their empathy and specific knowledge. AD, as a disease without cure, is by its definition a palliative disease, so every society should develop and improve palliative medicine and best care for people with dementia (PWD) and help the informal caregivers and families. Continues medical and social support is needed for all PWD due to fact that disease is long-lasting and devastating. Timely diagnoses should be provided for all, but post-diagnostic support is even more needed. Informal carers need education, support at their homes, prevention in developing the burn-out syndrome and other psychiatric disorders. Standard pharmacological treatment is obligatory, but additional non-pharmacological approach is beneficial and always recommended. The research in the field of psychopharmacology is very vivid and almost hundred substances are tested for potential anti-dementia drug. Amiloid and tau hypothesis are under questioning, and inovative treatment, personal approach, like immunisation may be a future option. Dementia friendly communities / spots, dementia friends' projects, Alzheimer Café's and other may be the good way to help people live with dementia. Non-governmental organisations (NGO) help whole society in showing the way how the things should be improved or organized, but of course this is not enough to make a substantial move and make significant difference. Only national dementia strategy / plan can make the difference and would cover the variety of needs for PWD during the long period of illness. Although the long life without AD is not pretty much certain, the preclinical treatment of AD is probable in (near) future. For that reason, new biomarkers for AD should be developed. So, leaving with AD, but without dementia, will hopefully be our future.

**Fran Borovečki (Zagreb, Croatia): Novel genomic methods in research and diagnostics of Alzheimer's disease**

**Introduction/Objectives:** Accelerated aging of the population has led to a significant increase in the incidence of dementia, especially Alzheimer's disease (AD), which is now one of the leading public health problems in modern society. AD is the most common cause of dementia and the most common neurodegenerative disease. Genetic studies conducted in AD patients indicated that mutations in certain genes, such as amyloid precursor protein (APP), presenilins 1 (PSEN1) and 2 (PSEN2), can cause familial AB.

**Participants, Materials/Methods:** Over the past 15 years, the development of high-throughput genomic technologies has yielded a better understanding of molecular mechanisms in AD. Genome Wide Association Studies (GWAS) enabled a better understanding of common genetic variants influencing the development of AD, while next generation sequencing (NGS) studies identified over 20 rare functional variants exerting large effects on AD risk.

**Results:** The aforementioned mutations are rare in the general population and can be found in only 5-10% of patients with AB, especially in patients with early onset of the disease. However, a large number of mutations have been discovered in these genes so far, with 49 pathogenic mutations in APP, 216 mutations in PSEN and 16 mutations in PSEN2 genes. The sporadic form of AD occurs in more than 90% of cases and is characterized by complex inheritance with genetic variants that contribute to the risk of developing the disease. Genome Wide Association Studies (GWAS) enabled discovery of genes involved in sporadic form of AD and pointed to apolipoprotein E (APOE) as a significant risk factor for AB development. The molecular mechanisms relating APOE and AD risk increase are not fully elucidated yet, whereas many research teams have found significant differences among ethnic groups. Additional genetic associations have shown that more than 695 genes can be a risk factor for developing the disease.

**Conclusions:** The most recent research carried out by sequencing the entire genome has shown that variations in copy number variations (CNV) and rare variants of genotype significantly contribute to the risk of developing the disease. AD shows direct hereditary mechanisms in a limited number of cases, but recent studies point to a number of genetic factors that can contribute to the risk of developing the disease.

**Nataša Klepac (Zagreb, Croatia): How to recognize major neurocognitive disorder early?**

Neurocognitive disorders involve cognitive impairments and decline, and most often affect the elderly and they are synonym for dementia. Alzheimer's disease (AD) accounts for the majority of cases of neurocognitive disorders and is defined as a significant, persistent, and progressive memory loss combined with cognitive impairment and personality change. The primary risk factor for AD is old age, so as the demographics of many societies change, the prevalence of AD is increasing and there are about 44 million people suffering from AD all over the world. AD is characterized by a chronic and progressive neurodegenerative process resulting from the intracellular and extracellular accumulation of fibrillary proteins: beta-amyloid and hyperphosphorylated Tau. Overaccumulation of these aggregates leads to synaptic dysfunction and subsequent neuronal loss. The precise molecular mechanisms of AD are still not fully understood but it is clear that AD is a multifactorial disorder. Amyloid based hypothesis led to develop biomarkers oriented diagnosis of AD. Amyloid  $\beta$ 42, and tau proteins are established core cerebrospinal biomarkers. MRI and PET CT are established imaging techniques for diagnosis of AD. It has been established that some AD biomarkers such as amyloid-beta load in the brain, precede the onset of the disease, by approximately 20 years. This has involved in the concept of preclinical AD that is defined as biomarker evidence of AD pathological changes in cognitively healthy individuals. Patients with subjective cognitive decline have been identified as a useful population in whom to look for preclinical Alzheimer's disease. Moreover, the therapy to prevent or effectively treat AD has to be initiated before the emergence of symptoms. These has resolved with the development of compounds acting on the main stages of the pathogenesis of the disease (the so-called "disease-modifying agents") - these drugs could potentially slow the development of structural and functional abnormalities in the central nervous system providing sustainable improvements of cognitive functions, which persist even after drug withdrawal. Moderately positive results for interventions targeting several lifestyle factors in non-demented elderly patients and moderately positive interim results for lowering amyloid in pre-dementia AD suggest that, ultimately, there will be a future in which specific anti-AD therapy will be combined with lifestyle interventions targeting general brain health to jointly combat the disease.

**Marija Kušan Jukić, Ninoslav Mimica (Zagreb, Croatia): The role of psychiatrist during the progression of Alzheimer's disease**

Psychiatrists are uniquely qualified professionals who participate in providing different services for patients with Alzheimer's disease (AD) and their families (informal caregivers) and professional caregivers. The role of the psychiatrists are changing during the AD from the recognition of early symptoms of cognitive function deterioration and close collaboration with neurologists in term to clarify and diagnose dementia to active role in evaluation and treatment of behaviour and psychiatric symptoms of dementia (BPSD). The psychiatrist may also recommend and follow up the treatment with antidementia drugs as well as evaluate functioning and competencies of people with dementia. In addition, psychiatrist is entitled to recognize comorbidity (e.g. depression, psychosis or delirium) that require interventions – the use of psychopharmacs and a range of nonpharmacological methods, with following the side effects and drug interactions. It seems that psychiatric approach become more important in advanced stages of disease when the psychiatric and behaviour symptoms appear more frequently. Moreover the psychiatrists should be trained to provide psychological help to family members coping with emotional stress during caregiving and the bereavement. As the leader of the mental health team, the psychiatrist serves as educator and information provider to patients and their families. Lately, the psychiatrist works closely with caregivers to monitor for and prevent burnout and depression.

**STROKE SYMPOSIUM - DIAGNOSIS AND TREATMENT OF HEMORRHAGIC STROKE /  
NEUROPROTECTION**

**Dimitre Staykov (Eisenstadt, Austria): Intraventricular Hemorrhage**

Intraventricular hemorrhage (IVH) occurs in approximately 50% of all patients with intracerebral hemorrhage (ICH) and represents a strong negative prognostic predictor leading to up to fivefold higher mortality and worse clinical outcome, as compared to ICH alone. In the past three decades, efforts have been made to investigate different specific treatment approaches aiming at IVH. The concept of intraventricular fibrinolysis (IVF) has been tested in the clinical setting since the early nineties. A recently published large phase III randomized controlled trial (CLEAR III) has thrown some light on the effects of this treatment. This and other recently developed treatment approaches, as endoscopic IVH evacuation and lumbar drainage for posthemorrhagic resorptive hydrocephalus are reviewed in the present lecture.

**Alexander Tsiskaridze (Tbilisi, Georgia): Intracerebral hemorrhage and atrial fibrillation**

Atrial fibrillation (AF) is a global health care problem with increasing prevalence and incidence worldwide. This condition is characterized by high risk of death, heart failure and thromboembolic events including ischemic stroke. The benefit of anticoagulation for thromboembolism prophylaxis in patients with AF is well established. Although highly effective, anticoagulant treatment comprises significant bleeding risks. The oral anticoagulation-related intracerebral hemorrhage (OAT-ICH) is a major bleeding, resulting in a life-threatening condition. Established risk factors for OAT-ICH are advanced age, race (Asian, Hispanic and black), intensity of anticoagulation, hypertension and history of cerebrovascular disease; while probable risk factors are cerebral amyloid angiopathy, genetic polymorphisms of CYP45049, concomitant antiplatelet use, leukoaraiosis and cerebral microbleeds. In almost half of cases the bleeding evolves slowly, for 24 hours or more and ICH often continues to expand after the diagnosis is made by neuroimaging studies. Mortality rates in patients with OAT-ICH range from 52% to 67%, and are higher than those observed in patients with spontaneous ICH with higher rate of disability. Therapeutic strategy in OAT-ICH consists of similar measures used for spontaneous ICH including general supportive care, prevention and treatment of complications, and neurosurgical intervention when indicated. Specific for OAT-ICH treatment implies prevention of hematoma expansion by immediate reversal of anticoagulation. Resumption of anticoagulation after OAT-ICH is a matter of debate. Although there are no formal guidelines on this issue, limited data suggest that anticoagulation could be safely restarted within 4 weeks of ICH in selected group of AF patients with high risk of thromboembolism.

**Srećko Gajović (Zagreb, Croatia): Molecular imaging of brain repair after ischemic lesion**

**Introduction/Objectives:** The preclinical research on stroke requires constant advancement in order to provide experimental models relevant to the clinical situation. Although there was clinical improvement in recanalization of the affected artery either by thrombolysis or thrombectomy in acute stroke, still no therapy is available in regards to neuroprotection and neurorepair. The objective of our research is to use the advantages of in vivo imaging to improve clinical relevance of the preclinical stroke models.

**Participants, Materials/Methods:** Medial cerebral artery occlusion (MCAO) was used as a model of ischemic stroke. The animals were assessed in vivo at multiple time points by magnetic resonance imaging (MRI) and bioluminescence imaging (BLI). Mice with reduced neuroinflammation due to loss of function of Tlr2 gene (Tlr2 KO) were compared to wild type (WT) control. The functional deficits were monitored by neurological scoring and behavioral tests. **Results:** Visualization of ischemic lesion evolution by MRI allowed stratification of animals according to the severity of the brain pathologies. Subsequently, in vivo quantification of gene expression by BLI could be related to the lesion size. This strategy allowed for individualized assessment of every mouse and resulted in statistically significant difference in brain repair elements between Tlr2 KO and WT animals.

**Conclusions:** The in vivo preclinical imaging with insight in gene expression relevant to stroke allows to monitor and evaluate the neurorepair after mouse brain ischemia.

**STUDENTS' SYMPOSIUM****Luka Filipović-Grčić, Filip Đerke (Zagreb, Croatia): Watch Your Brain Project**

Has your child ever fallen from a bicycle, or suffered a blow during a football game? If so, did you know that such events can lead to traumatic brain injuries (TBI), of which the concussion is the most prominent representative. Concussion is recognised as a clinical syndrome of biomechanically induced alternation of brain function, typically affecting memory and orientation, which may involve loss of consciousness (LOC). Estimates of sports-related mild traumatic brain injury (mTBI) range from 1.6 to 3.8 million affected individuals annually in the United States, many of whom do not obtain immediate medical attention. Because of these alarming statistics we designed the „Watch your brain“ project, which aims mainly elementary school pupils. The purpose of this project is to broaden the knowledge considering traumatic brain injuries, functioning of the brain, and ways of improving and protecting brain health. The long term goals of the project are the recognition of first signs of TBI and early help seeking.

Watch your brain project will involve about 1000 students from Zagreb (Croatia). TBI promotion, interventions will be delivered at two levels: one, where we will visit seven elementary schools in Zagreb, another, where we will host PE teachers, coaches, trainers in our own facilities. School will be chosen randomly, and the project will be held with classes in those schools which agree to cooperate on the project. Knowledge assessments for all students will be organised before and after the lectures.

**Filip Đerke, Luka Filipović-Grčić, Ino Kermc (Zagreb, Croatia): Making Data Meaningful**

News releases are often the vehicle through which our scientific and healthcare organizations communicate key findings of its statistical and analytical findings to the intended audience, which is most probably the general public. The text is the principal vehicle for explaining the findings, outlining trends and providing contextual information.

An effective news release is one that: tells a story about the data; has relevance for the public and answers the question “Why should my audience want to read about this?”; catches the reader's attention quickly with a headline or image; is easily understood, interesting and often entertaining; encourages others, including the media, to use statistics appropriately to add impact to what they are communicating.

Several studies, journal guidelines, and discourses on scientific writing affirm the critical role that tables, figures, and graphs (or display items) play in enhancing the quality of manuscripts. Scientific tables and graphs can be utilized to represent sizeable numerical or statistical data in a time- and space-effective manner. Readers are often drawn towards tables and figures, because they perceive it as easy-reading, as compared to reading a verbose account of the same content. They rightly assume that these display items will provide them with a larger amount of information in a shorter time span. At the manuscript screening stage, these display items offer reviewers and journal editors a quick overview of the study findings, and once the paper is published, they do the same for readers (some of whom look only at these display items and not at the rest of the manuscript). However, tables and figures only add value to the format of a research report, if they are brief yet sufficiently informative.

Figures and tables, or display items, are powerful communication tools—they give your manuscript a professional feel, attract and sustain the interest of readers, and efficiently present large amounts of complex information. Moreover, as most journals editors and reviewers will glance at these display items before they begin a full reading of your paper, their importance cannot be overemphasized.

**Kristian Dominik Rudež (Zagreb, Croatia): Medical internship in Croatia – an obligation or a necessity? A survey among students at the University of Zagreb School of Medicine**

**Introduction/Objectives:** Medical internship is work done under supervision, during which a young doctor is trained for independent work. In most countries, internship is a regular part of medical education, following medical school and preceding independent practice. In 2013, the duration of medical internship in Croatia was shortened from one year to 5 months, with plans to abolish it completely by 2019. Concerned with the situation and its uncertainty, the Croatian medical schools' student councils came together and organized a survey. Our aim was to investigate the Croatian medical students' opinion on medical internship and see whether they find it necessary. This paper's methods and results only pertain to the students of the Zagreb Medical School.

**Patients, Materials, Methods:** Anonymous paper-based survey was distributed from March 12 to March 16, 2018 to 2190 medical students at the University of Zagreb School of Medicine.

**Results:** The questionnaire response rate was 47%. The vast majority of surveyed students were not satisfied with how the Ministry of Health informed them about their future after graduating from medical school (97%), with only 3% stating they were content with it. When asked how competent they thought they were for independent work in the ER or as a GP, most of the students graded themselves with the lowest grades 1 and 2 (23% and 47% respectively). About one quarter of the surveyed students gave themselves a 3 (23%), while only 6% thought of themselves as mostly competent. Just 2% regarded themselves as completely ready for independent work. There were 9.1% of the responders who stated they didn't want internship at all, while others expressed their wish for it. Of those in favor of internship, most want it to be 1 year long (44.7%), while 40.1% think 6 months would suffice. Only 12.6% thought 5 months was the best option, while 2.6% of the surveyed had other ideas about internship length. Finally, almost all of the students think they should get adequately paid for their work during their internship (98%).

**Conclusions:** Most of the students want internship. Since most of the surveyed students thought they were incompetent for independent work, I believe further practical training after graduating in form of an internship is necessary and that abolishing it would be unreasonable. This internship should serve as a transition period for students to become doctors and for them to gain the experience and skills needed to work independently.

**Kristian Dominik Rudež (Zagreb, Croatia): Croatian Student Summit - CROSS**

Croatian Student Summit is an international scientific congress of students and young scientists in the field of biomedicine. The Congress, organized by the University of Zagreb School of Medicine Student council, is held annually, usually in April, at the University of Zagreb School of Medicine. The fourteenth Croatian Student Summit – CROSS 14, was held 10-13 April, 2018 and its main topic was “Health Promotion”.

The story of CROSS started in 2004, when a group of young enthusiasts came up with an idea of organizing an event for students to share their knowledge and present their scientific work. Since those small beginnings, CROSS has grown tremendously and has become an established part of our School’s already rich tradition. Throughout these fourteen years, the Croatian Student Summit has hosted more than one hundred lecturers and more than one thousand student poster presentations. Thousands of people from all over the world have had the chance to enjoy our Congress, and the number of foreign delegates participating at the Congress increases annually.

CROSS participants can attend the Congress actively or passively. Passive participants can attend all lectures and poster presentations, along with a workshop of their choice, while active participants are also given the opportunity to present their research papers through poster presentations. Besides the scientific program, CROSS also has a rich social program, which includes a city sightseeing tour, museum visits, a gala dinner and an after-party. This social program allows participants to meet new people and establish contacts with other colleagues and lecturers, thus maybe helping them with their future work and professional careers.

Today, Croatian Student Summit has established itself as an indispensable scientific event in Croatia, recognized in Europe and the world.

**Sandro Gašpar, Iva Hižar, Deni Rkman, Mirjana Kujundžić Tiljak, Iskra Alexandra Nola, Marjeta Majer (Zagreb, Croatia): Public health web site “Pitaj Andriju”**

The web portal "Pitaj Andriju" is designed for students of the University of Zagreb and all students of the Republic of Croatia for obtaining relevant information in the field of public health and healthcare in general. The aim of this portal is education of non-medical students in the Republic of Croatia in the field of health care and advanced education for students of School of Medicine, University of Zagreb in terms of improving communication with citizens. Students who visit the web site can anonymously ask questions in the most common fields of student age group problems, for example topics in mental health, abuse of nicotine and alcohol, vaccination, diet problems and anorexia, etc. Questions are going to be added on the web site as frequent asked questions (FAQ ) database so that every visitor of the web site can read all of the answered questions. In addition, students from School of Medicine, University of Zagreb will write a blog at least once a week covering specific public health topics which are relevant and interesting to student population. The web portal "Pitaj Andriju" presents progress and great innovation by spreading the health culture among the academic community and it represents a great pledge for the future as a place where students will be introduced to interesting and specific health topics related to their population groups. The web site “Pitaj Andriju” and students behind the web site got the support of the rector of University of Zagreb as strategic project for health promotion among students.

**Ivan Franin (Rijeka, Croatia): Scientific activities of the University of Rijeka Students' Council**

Understanding the student's scientific-research activity as an extremely important segment of education, and science as one of the core activities of the academic community, the University of Rijeka Students' Council established the Office for Science. The activities of the Office of Science are primarily directed towards the affirmation of scientific research work among the students of the University of Rijeka. The aim of the Office is to bring students closer to the students scientific activities, to motivate them and to engage in scientific projects, to provide relevant information and to be a service for all students: from research, preparation for publication of scientific work, congress participation and development of international cooperation. Continuous activities create a platform for creative study and motivation for young people to generate a productive academic environment.

The work plan of the Office of Science of the University of Rijeka Students' Council in 2018. was funding „SIZIF“ - fund for scientific-research activities of students, organizing projects and events related to the popularization of science and promotion of the activities of the Office for Science. The Office for Science collaborates with student science teams and associations from all faculties of the University of Rijeka. It organises scientific Pub Quizzes, marks the „International Day of Women in Science“, organises a Two-day workshop "The basics of scientific expression", holds science cafes and film evenings and organised „Brain Week 2018.“ This year the Office for science also organises a Scientific Corner and Section within „Student Day Festival 2018.“ and marks the „UNESCO World Day of Science“. A near future goal is also a plan to establish a register of scientific activities of students at the University of Rijeka.

**Ivan Franin, Ema Karmelić (Rijeka, Croatia)† Student scientific activities at the Faculty of Medicine, University of Rijeka**

The Student Union of Faculty of Medicine, University of Rijeka, is a non-profit and non-political body of students at the Faculty of Medicine, University of Rijeka. The objectives, activities and principles of the Student Union is the protection of students' rights and interests, improving standard and quality of education, advertising medicine and promoting science among students. It is the oldest and largest student association at the University, established 60 years ago and counting more than 100 members a year and organizing more than 30 student projects per year.

Our biggest scientific projects are student congresses, symposia, schools and workshops. The oldest of them is the „Congress of Nutrition and Clinical Dietotherapy“ which focuses on improper nutrition, obesity and public health problems and its goal is popularization of healthy and balanced diet. The „Student congress of neuroscience – NeuRi“ is a traditional April gathering of young lovers of neuroscience, which is being held at the Medical Faculty Rijeka and Rab Psychiatric Hospital. „The Congress of Emergency Medicine“ is intended for students, interns, and young doctors with a goal to provide a platform for discussion, exchange of ideas and education of future health professionals with an interest in emergency medicine. We are also holding internal symposiums of medical students where students can present their scientific research and organising Workshops on Writing Scientific Papers for students who need help on how to start a research. One of the most popular projects is the „Science Caffè“ created as an idea for a place where students and faculty members are listening to a chosen science topic presented by a lecturer and discussing about it while drinking coffee in a pub.

**Nika Benjak, Željka Petelin Gadže: Epilepsy and Pregnancy**

Although epilepsy is one of the most common neurological diseases today, it still represents a significant medical and public health issue, especially in specific groups of patients such as pregnant women. Pregnancy, itself, is a period in which women's physiology and psychology changes. When pregnancy is accompanied by a severe disease, it is unambiguous how difficult it is to keep the disease under control and not harm the woman nor her child at the same time.

Pregnant women with epilepsy are a high-risk group and because of this, they require constant monitoring during pregnancy, both from gynecologists and epileptologists. Pre-planned pregnancy, receiving appropriate therapy during pregnancy and regular frequent medical examinations should result in a normal pregnancy and birth without any complications. The main goal of anti-epileptic therapy in pregnant women is to achieve a balance between complete control of epileptic seizures with minimal dosage of the drug and potential teratogenic effects of anti-epileptic drugs (AEDs). It should be stressed to pregnant women that a high percentage of pregnancies are considered to be normal and do not have complications whereas the frequency of congenital malformations depends on the type, dosage and number of anti-epileptics. Valproates should be avoided because of its teratogenic potential. Lamotrigine, carbamazepine, levetiracetam and oxcarbazepine are recommended due to their minimal effect on the fetus. Taking folic acid is highly recommended during pregnancy in order to prevent the formation of neural tube defects and in the last month of pregnancy vitamin K should be taken to prevent neonatal hemorrhage after delivery. Breastfeeding is also highly recommended considering the fact that it results in various positive effects on the mother and the child but monitoring serum concentrations of the drugs in the child is sometimes necessary.

## Lectures

**Alen Juginović, Josip Melvan, Miroslav Jelaska (Split, Croatia): Practical Knowledge for Students: a unique International Conference in Split, Croatia**

The international conference Practical Knowledge for Students is a unique four-day regional project organized fully and voluntarily by all the student societies at the University of Split School of Medicine in Split, Croatia, including the Student Society for Neuroscience NeuroSplit in collaboration with the Split School of Medicine. The main goal of the Conference was to teach the medical, dental medicine and pharmacy students the most important practical knowledge they need in their future career as well as to promote collaboration between faculties of different countries for a better and more prosperous future.

This is the second year in a row that this project is being organized. Last year the Conference, which was held between the 6th and 8th of April 2017 at the University of Split School of Medicine, had more than 230 participants, i.e. students from Croatia and over 35 domestic lecturers. The project was under the auspices of the Croatian Ministry of Science and Education.

In April of 2018 at the University of Split School of Medicine we organized the Conference again due to the great feedback from last year. The Conference was under the auspices of the President of the Republic of Croatia, Ministry of Science and Education and the Ministry of Health of the Republic of Croatia. It included more than 65 workshops or lectures which were held by experienced professors from Croatia, Slovenia, Italy, Germany and lasted 4 days, from 5th to 8th April 2018. Some of the topics that were covered are: basic clinical skills, neurological status, suturing and treatment of wounds, basic life support, interpreting diagnostic methods, surgery in dental medicine, clinical skills in dental medicine and pharmacy, aromatherapy, vaccination and so forth. The workshops were reserved for students for a registration fee of 40 HRK or 80 HRK, but the lectures were totally free and open for the public. When we opened the registrations for student's form 6 countries in the region (Croatia, Slovenia, Serbia, Bosnia and Herzegovina, Macedonia and Montenegro), almost 90% of the places were taken in the first 10 minutes which emphasizes the need for practical knowledge and the quality of the project.

We are very proud to say that apart from more than 70 great domestic and international professors, the 1991 Nobel Prize in Physiology or Medicine winner prof. Erwin Nether from the Max Planck Institute in Germany did a lecture about the function of a single ion channel at the opening ceremony in a packed amphitheatre of our Medical School with around 400 guests and a workshop on calcium channels as well, both of which were very exciting for all the students and academic staff. Prof Fabrizio Benedetti, one of the leading researchers in the world on the placebo effect came from the University of Turin, Italy to do a lecture as well. In total, around 500 students, professors, volunteers and technical staff participated in making the Conference one of the very best students conferences in the region.

To promote collaboration and the sense of unity between these faculties from six different countries in the region we organized a first ever meeting of this kind during our Conference. The main goal of the meeting was to start collaborating on already existing projects or making new great projects for the benefit of all these faculties and their students.

To summarise, Practical Knowledge for Students 2018 was a unique regional project that lasted 4 days and through many different workshops in and lectures gathered almost 500 participants in the beautiful city of Split, Croatia in the goal to improve practical knowledge with the help of a Nobel Prize Winner and many other great lecturers. Without amazing teamwork and determination this project would not have been possible. Hopefully for the next year we can improve the conference even more and offer all the international participants an even better experience in the Split School of Medicine.

**Nazmie Ibishi, Zylfije Hundozi, Valbona Govori, Shpend Haxhibeqiri, Nebi Musliu (Prishtina, Kosovo):  
Preclinical stage of Alzheimer's disease- future considerations**

**Introduction/Objectives:** Pathophysiological process of Alzheimer disease (AD) begins many years prior to clinically obvious symptoms, and the concept of a presymptomatic or preclinical stage of AD is becoming widely. Advances in biomarker studies have enabled detection of AD pathology in vivo in clinically normal older individuals. The generalized nature of the deficit is consistent with recent observations that multiple brain structures and functions are affected long before the AD diagnosis. Autosomal dominant Alzheimer's disease was associated with a series of pathophysiological changes over decades in Cerebrospinal fluid biochemical markers, brain amyloid deposition, and brain metabolism as well as progressive cognitive impairment.

**Participants, Materials/Methods:** Autosomal dominant Alzheimer's disease was associated with a series of pathophysiological changes over decades in Cerebrospinal fluid biochemical markers, brain amyloid deposition, and brain metabolism as well as progressive cognitive impairment. Breakthroughs in genetics led to the identification of 3 early-onset Alzheimer disease autosomal dominant genes, each of which affects the metabolism of the small  $\beta$ -amyloid ( $A\beta$ ) peptide. This peptide is the core component of senile plaques, one of the two major histopathological hallmarks of the disease. Biochemical and molecular analyses ultimately led to the identification of the  $\beta$ - and  $\gamma$ -secretases, enzymes important in generating  $A\beta$ , and innovative approaches aimed at clearing  $A\beta$ , including immunotherapy. It is also importantly, that very early stage of AD is marked by episodic memory deficit detected 7 year before diagnosis, executive function decline detected 2-3 years before diagnosis, perceptual speed and working memory impairments. Cognitive functions subserved by the medial and lateral temporal lobes are the most impaired, with relatively less impairment abilities thought to be subserved by the frontal lobes. No preclinical impairment was found in primary memory. Thus many authors conclude that deficits in multiple cognitive domains are characteristic of AD several years before clinical diagnosis, and appears to be a sign of progression to AD.

**Conclusions:** Future studies are recommended to detect and monitor changes in working memory, attention, and executive function in preclinical stage of AD. While much remains to be learned about preclinical AD, the enormity of the need for effective therapy requires the rapid initiation of trials. Presumably, early interventional studies will further elucidate the trajectory of cognitive decline during the preclinical stages of AD . The long preclinical phase of amyloid-mediated neurodegeneration before emergence of clinical symptoms of AD provides a critical opportunity for potential intervention with disease-modifying therapy including cognitive interventions, if we are able to elucidate the link between the pathophysiological process and early stage of cognitive impairment .

Lectures

**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**

**Anton Glasnović (Zagreb, Croatia): RANKL axis in brain pathology**

Receptor activator of NFκB ligand (RANKL) pathway and its action is already known in bone metabolism, primarily inducing bone remodelling by activating osteoclasts and subsequent bone resorption. This pathway has already been shown to be important in autoimmune diseases, and RANKL blockage improved clinical outcomes in patients with rheumatoid disease. New studies also shown that this pathway could also be one of the key elements in brain inflammation, and not only autoimmune, as seen in multiple sclerosis, but also in postischaemic inflammation and other similar pathologic events. In this lecture we will try to see what are new insights in RANKL function in brain, as well as give future guidelines and perspectives for research in neuroinflammation as a new and exciting field in neuroscientific research.

## Lectures

**Matija Zupan, Bojana Žvan (Ljubljana, Slovenia): Cognitive impairment in a small cohort of patients with ischemic leukoaraiosis: a pilot study**

**Introduction/Objectives:** In a previous study of our research group, we found out that patients with ischemic leukoaraiosis (LA) harbor a significant impairment of both cerebral and systemic endothelial function independent of risk factors for atherosclerosis. It is well known that LA is associated with vascular cognitive impairment encompassing the whole spectrum from mild cognitive impairment to frank vascular dementia. A subcortical pattern of cognitive impairment ensues reflecting in executive dysfunction and cognitive slowing. The aim of this pilot study was to assess cognitive function in a small cohort of patients with LA.

**Participants, Materials/Methods:** Thirty-four patients with LA ( $57 \pm 7$  years) and 24 sex- and age-matched controls without LA ( $55 \pm 5$  years) were recruited. The cognitive assessment included a detailed neuropsychiatric examination including the Mini mental state examination (MMSE), the Addenbrooke's cognitive examination (ACE-III) and the Trail making test (TMT) (parts A and B). The patients were stratified into different categories of cognitive impairment. All participants underwent a brain magnetic resonance imaging adjusted to search for radiologic signs of LA. Statistical analysis was carried out with statistical program SPSS 25.0.0. The unpaired t test was used to compare parametric variables between the two groups. The Fisher's exact test was used to compare categorical variables. For any statistical test, the  $p \leq 0.05$  was regarded as statistically significant.

**Results:** The duration of formal education was similar in both groups ( $13 \pm 3$  vs.  $14 \pm 3$  years,  $p=0.491$ ). The groups differed in MMSE scores ( $27.4 \pm 3.3$  vs.  $28.8 \pm 1.2$ ,  $p=0.028$ ), ACE-III scores ( $87.2 \pm 13.4$  vs.  $93.6 \pm 2.8$ ,  $p=0.011$ ), and time spent to accomplish TMT-B ( $189 \pm 104$  s vs.  $115 \pm 57$  s,  $p=0.009$ ). The groups differed in the presence of any cognitive impairment (23 (67%) vs. 6 (25%),  $p=0.003$ ), vascular mild cognitive impairment (11 (32%) vs. 1 (4%),  $p=0.01$ ), and any mood disorder (2 (6%) vs. 7 (29%),  $p=0.027$ ).

**Conclusions:** Additionally to generalized endothelial dysfunction, the patients with LA have significant cognitive impairment, which can be detected even in relatively young patients in earlier stages of the disease. The study underlines the importance of actively searching for cognitive impairment in patients with LA, which may have future implications with the arrival of novel drugs targeting cognitive dysfunction.

**Sanja Tomasović Josip Sremec, Jelena Koščak Lukač (Zagreb, Croatia): Epidemiology of pharmacological treatment of multiple sclerosis in Croatia**

**Introduction/Objectives:** Treatment of multiple sclerosis has been a dynamic field lately, with many new and emerging treatment options. In this study, we investigate the use of disease modifying therapies (DMTs) for multiple sclerosis in Croatia. Psychiatric symptoms are common in patients with MS, influencing their quality of life and adherence to treatments. Among individuals with MS, relative to the general population, lifetime prevalence rates are elevated for major depressive disorder (MDD), bipolar disorder, anxiety disorders, adjustment disorders, and psychotic disorders. Suicide may be at least twice as common. Although it is well known that emotional disorders are common among individuals with MS, these disorders are often undetected and inadequately treated.

**Participants, Materials/Methods:** The data on DMT use was provided by the Agency for Medicinal Products and Medical Devices of Croatia (HALMED). The data from 2005 to 2016 was available.

**Results:** Consumption of DMTs (in DDD/1000/day) has been increasing by 9% annually on average since 2005. In the same period, the annual cost for those drugs has been increasing by 14.6% annually on average. The consumption of IFN-beta 1-a has been increasing by a much steeper rate than IFN-beta 1-b. Until 2010 the consumption of glatiramer acetate has been negligible, with a steep increase between 2011 and 2014, and a steady rate of consumption since. Recently, several new DMTs became available, namely dimethyl fumarate, teriflunomide and fingolimod. Natalizumab became available after 2010, and its consumption has been growing steadily, but its consumption figures are exceeded by alemtuzumab.

**Conclusions:** The consumption of new DMTs are not as readily available in Croatia as they are in some countries. However, there is a continuous increase in the number of prescriptions, along with growing costs in pharmacological treatment of multiple sclerosis, and this can be expected to become even more pronounced in the following years, due to the abundance of new therapeutic options that are steadily becoming available.

**Boris Aleksovski, Vladimir Rendeovski, Ana Mihajlovska Rendevska (Skopje, Macedonia): Evaluation of the role and interactions among peripheral biochemical markers in depression and intracerebral hemorrhage: state biomarkers, prognostic factors and modeling of the outcomes in clinical decision making**

Both recurrent depression and intracerebral hemorrhage are associated with severe disability, leading to devastating consequences which fundamentally affect all aspects of quality of life, including careers, families, friendships and often causing tremendous economic costs. Even sixteen years ago, Major Depression Disorder (MDD) was assessed as the global leading cause of disability, ranged as the third cause of the global burden of diseases, alarmingly affecting 350 million people worldwide. Similarly, intracerebral hemorrhage (ICH) as the least treatable, deadliest and most devastating subtype of all strokes, is characterized by 40% 30-day case fatality, causing among survivors the worst long-term neurological outcomes associated with major functional dependence. Relevant markers in the peripheral blood which can reflect brain abnormalities at the time of the symptom onset and peripheral biochemical markers-based models are therefore substantially important, as they can strongly influence treatment recommendations, being particularly useful as risk adjusters for prognostication of the actual outcomes and prevention of further devastating deteriorations.

Both recurrent depression (RDD) and ICH are brain illnesses. In RDD, genetic as well as developmental causal factors can operate even *in utero*, tending to produce brain developmental changes that persist throughout adult life. Two major brain systems are mainly associated with the etiology and the biological predisposition to vulnerability (diathesis) in RDD, involving abnormal brain structure and function of the serotonergic and the noradrenergic system. From 1969, when several working groups independently proposed the indoleamine hypothesis of depression, till now, a variety of studies have reinforced the role of brain serotonergic system in major depression and identified additional associations with suicidal behavior, impulsive aggression, eating disorders, obsessive-compulsive disorder, anxiety disorders and alcoholism.

Platelets were suggested as noninvasive neurological model for serotonergic neurons and a peripheral depot of blood serotonin. Several studies have shown that brain serotonin can cross the blood-brain barrier where peripherally, it is immediately being uptaken by the platelets. Although the enterochromaffin cells in the gastrointestinal system are the major source for peripheral serotonin, there is some evidence which suggests that peripheral serotonin levels, as well as the platelet serotonin receptor, transporter and  $\alpha 2$ -adrenergic receptor ( $\alpha 2$ -AR) activities can mirror the CNS status of the brain serotonergic and noradrenergic systems, which are mainly involved in the etiology of MDD.

Concerning ICH, inflammatory and excitotoxic mechanisms were repeatedly associated with the neurological impairments, edema formation and secondary brain injury after ICH, strongly influencing the functional status and outcomes. An increased permeability of the blood–brain barrier has been reported after ICH, leading to the hypothesis that the excitotoxic and pro-inflammatory mediators can transfer from the brain in the blood and be detected peripherally.

This lecture represents an overview of the obtained results from our research group, aimed at evaluation of the role and interactions among peripheral serotonin markers and  $\alpha 2$ -adrenergic receptor function in recurrent depression and the roles of glutamate and TNF- $\alpha$  as markers for excitotoxicity and inflammation in intracerebral hemorrhage. Special focus is given on their role as state or trait markers and their prognostic value for modeling of the functional status and outcomes in clinical decision making. As other cross-validation metacentric studies are needed to confirm these findings, our results raise the awareness for the importance of these markers in the sense of fostering evidence-based medicine, reduction of subjective severity assessments and proper, more objective judgements of the outcome and therapy recommendations.

**WORKSHOPS****WIPEOUT BURNOUT – EMOTIONAL HYGIENE FOR HEALTHCARE PROFESSIONALS****Igor Mošič (Rijeka, Croatia)**

The main intention of “Wipeout Burnout” presentation is to make sure that all the participants get a clear and most up-to-date understanding of NAM (Neuroplasticity Activation Meditating) emotional hygiene technology, the logic behind it, and the implications of it with regard to burnout in healthcare profession. The presentation will be followed by a 20-minute practical demonstration for everyone, which means that you will learn a practical method for reducing and eliminating burnout.

Many studies show that burnout is common among healthcare professionals. Repeated affective resonance with other peoples’ suffering often leads to burnout emphatic distress, which means physicians, nurses, and other caregivers are at high risk of developing burnout. What is burnout?

“Burnout” is a term attributed to accumulated, unresolved stress and all other negative mental states, mostly work-related. Burnout is not a thing that we can choose because if it was, nobody would choose to experience burnout, and it would not exist. If it is not a thing, then it is a product of different causes and conditions. We will investigate: What are the causes and conditions that produce burnout? How can we influence those causes and conditions? and finally, How specifically can we wipeout burnout from our experience?

But we will not stop at mere explanations and intellectual understanding of burnout. We will present and experience NAM (Neuroplasticity Activation Meditating) technology based on an ancient Tibetan tradition of cultivating emotional hygiene and mental stability, supported by modern medicine and neuroscience because it is a valuable and practical help for life without burnout.

**NEUROSONOLOGY WORKSHOP****Vida Demarin (Zagreb, Croatia): Vascular ultrasound of brain and neck**

Carotid atherosclerosis is recognized as an important factor in stroke pathophysiology and represents a key target in stroke prevention; multiple treatment modalities have been developed to battle this disease. Carotid ultrasound provides reliable assessment of the carotid bifurcation with high sensitivity and specificity. It is fast, inexpensive, and widely available. In TIA patients, carotid duplex and TCD performed within 24 hours of symptoms revealed a threefold greater risk for stroke in the next 90 days in those with moderate to severe extra- or intracranial carotid stenosis compared to patients with no such findings.

TCD can also detect microembolic signals (MESs) seen with extracranial or cardiac sources of emboli. A large number of MESs on TCD is a marker of risk in patients with emboli from the carotid origin, prompting research into optimal strategies for medical treatment and the timing of endarterectomy in those with an extracranial carotid disease. In a cohort of patients unselected for stroke mechanism, MESs were more common in patients with large-artery occlusive disease and were more prevalent in patients treated with anticoagulation rather than antiplatelet agents.

Carotid stenosis accounts for up to twenty percent of ischemic strokes and TIAs. It is a potentially preventable cause of stroke, and therefore, its detection and management is of an utmost importance.

The risk of stroke in the target vascular territory also rises with higher degree of symptomatic carotid stenosis (Hazard ratio (HR) 1.18 per 10% increase in stenosis; 95% confidence interval (CI) 1.10–1.25). It has been shown that the risk of stroke ipsilateral to ICA stenosis is greater in patients with recent neurological symptoms of ischemia in that vascular target artery. These preceding neurological symptoms have been stratified in the likelihood of subsequent ipsilateral stroke: major stroke (HR = 2.54; 95% CI 1.48–4.35), multiple TIAs (HR = 2.05; 95% CI 0.16–3.60), minor stroke (HR = 1.82; 95% CI 0.99–3.34), single TIA (HR = 1.41; 95% CI 0.75–2.66), and ocular events (HR = 1.0).

Plaque instability, another important risk factor, is characterized by a thin fibrous cap, large lipid core, reduced smooth muscle content, and a high macrophage density. Studies have shown that the irregular morphology or ulceration of the plaque carries an increased risk of a clinical event (HR = 2.03; CI 1.31–3.14). A thrombotic cascade occurs primarily when the thrombogenic center of the plaque is exposed to the bloodstream carrying clotting factors. The spike in the risk of stroke recurrence in the days and weeks after an ischemic event is likely the consequence of an unstable atherosclerotic plaque, and the rapid decline in risk over the subsequent months likely reflects the healing and stabilization of the said lesion and improved collateral blood flow to the ipsilateral cerebral hemisphere.

Risk factors for the risk of stroke in the presence of carotid stenosis are age, hypertension, coronary heart disease, irregular and ulcerated plaque morphology, absence of collateral flow, impaired cerebral reactivity, previous stroke or TIA, and microembolic signals observed on Transcranial Doppler (TCD). TCD provides noninvasive monitoring of intracranial stenosis, with a positive predictive value (PPV) of 36% and, negative predictive value (NPV) of 86%. The high NPV and the lower PPV reflect the low prevalence of intracranial stenosis in Caucasians, with higher rates in other ethnic groups.

**Sandra Morović (Zagreb, Croatia): Functional TCD**

Transcranial Doppler is a simple, noninvasive, bedside technique used to access cerebral hemodynamics. In asymptomatic patients it serves as a base for prevention, while in stroke patients testing helps classify the stroke type. The limitations of this method are blindness, operator dependence, and subject motivation (during testing, cognitive assignment results depend on subject motivation level). In cerebrovascular physiology assessment we can test the autoregulation mechanism (induced hypotension, Valsalva manouver, tilt-table test), vasoreactivity (responce to vasoreactive supstances: CO<sub>2</sub> inhalation, breath-holding, acetazolamid), and evoked flow (cerebral flow response to external cortical activation – visual, auditory or/and cognitive). The goal of functional testing is to detect a cerebral regulatory disfunction which can be acute or chronic. Acute cerebral regulatory disfunction occurs during trauma, stroke, hypertensive encephalopathy or intracranial infection. Chronic cerebral regulatory disfunction occurs during long-lasting hypertension, diabetes and hyperlipidaemia. Even though it is an operator, and subject dependent method, when performed by an experienced sonographer, using proposed standards in testing protocols, it is a very valuable and hardly replaceable method in cerebral hemodynamics assessment.

**Hrvoje Budinčević (Zagreb, Croatia): The use of ultrasound in intensive care unit**

Ultrasonography is a fast, inexpensive, widely available bed-side useful diagnostic a monitoring tool which is used in intensive care units or stroke units. The use of carotid ultrasound and transcranial Doppler is well established method for evaluating ischemic stroke. Orbital ultrasound with measurement of optic nerve sheath diameter and transcranial doppler are used for evaluation of increased intracranial pressure. Transcranial Doppler (TCD) can be used as a confirmatory test in brain death. In patients with subarachnoid hemorrhage transcranial Doppler is used for vasospasm monitoring and differentiation between vasospasm and cerebral hyperperfusion syndrome using Lindegaard's Index. Structural abnormalities of brain parenchyma such as primary intracerebral hemorrhage (ICH) and epiphenomena such as midline shift can be detected by native transcranial B-mode ultrasound. Echocardiography in intensive care setting is routinely used for evaluation of : 1) pericardial effusions, 2) myocardial insufficiency; 3) pulmonary embolism; 4) hypovolemia; and 5) confirmation of cardiac arrest. Focused Assessment with Sonography for Trauma (FAST) exam is used for evaluating patients with blunt or penetrating trauma. Ultrasonography is also used before and during practical procedures such as: 1) establishing vascular access (eg. central venous catheters and arterial line placement), 2) thoracocentesis; 3) percutaneous tracheostomy; 4) regional anesthesia. Ultrasonography is also used for confirmation of venous thrombosis and evaluation of kidney function (eg. post-renal acute renal insufficiency).

**YOUNG PSYCHIATRISTS: THE ROLE OF PSYCHOLOGICAL FACTORS IN PSYCHOPHARMACOTHERAPY****Duško Rudan, Vedran Bilić, Darko Marčinko (Zagreb, Croatia): A case report (with supervision)**

The case report describes a female patient XY, 34 years old, involved in a supportive psychotherapeutic treatment based on psychodynamic theoretical concepts and certain technical interventions. The patient turned for help to a psychiatrist due to difficulties in interpersonal relationships that in a shorter period of time developed into an emotional crisis. Therefore, in the initial phase of the treatment, patient was treated with medication therapy aimed at relieving anxiety and depressed mood. After the crisis was overcome, patient with a personality disorder showed a motivation for a better understanding of biological, psychological and social factors that led to these difficulties in the present, as well as to the understanding of their connection to past experiences. Supportive, psychodynamically oriented psychotherapy took place over several months, with once in a week frequency. The work with defense mechanisms and resistance, some of which had a transfer character within the given form of treatment, will be presented in the case report. In addition, countertransference reactions, which were in certain cases beneficiary for a better understanding of the patient's mental state, will also be considered. The paper will discuss the psychological dimension associated with the prescription of drugs, which is often neglected. This dimension is in the literature more often described in patients than in medical doctors. Less experienced medical doctors, e.g. psychiatry residents at the beginning of their training, are generally not prepared for complex and irrational processes that follow the very act of prescribing and taking medication. Psychodynamic understanding can in these cases provide a 'holding' context that makes it easier to explain some of the psychiatry resident's and patient's mental states. This understanding also supports the thesis of certain authors that the approach to administering medication during each psychotherapeutic treatment should be treated the same as any other aspect of therapeutic process. On the other hand, there are authors who hold the opposite view and consider these to be two parallel processes. It is being increasingly emphasized in the literature that the combination of pharmacotherapy and psychotherapy is complementary. These two approaches are not in conflict, or even incompatible, as some psychotherapeutic techniques suggest.

## POSTERS PSYCHIATRY

**1. THE META-GAVGAI PROBLEM AND ITS IMPLICATION TO PSYCHIATRIC DIAGNOSIS**

Sriram Balasubramanian

Kalahasti Ashram Knowledge Ventures, Chennai, India

**Introduction/Objectives:** The Gavagai problem is a famous and well thought out construct which aims at establishing a fundamental indeterminacy in translation, the comprehension and analysis of implication of a given foreign linguistic construct. While the Gavagai problem remains at the realm of language an extension in this spirit is possible for emotional and cognitive communications in a specific language itself much in the spirit of existential constructs of reality communicated in that language. In this context language itself becomes an approximation of an experience in the Gavagai sense thus a meta-Gavagai problem. This meta- Gavagai has a deep and relevant significance in the manner in which a DSM based psychiatric diagnosis gains validity as the DSM itself is suggestive of a disorder and based on verbal cues and thus open to interpretation.

**Participants, Materials/Methods:** The meta gavagai construct operates at three levels. Firstly in the spirit of meta-gavagai the entire German repertoire of the original literature in psychoanalysis is subject in terms of the “experience of a disorder”/ “description of the disorder for diagnosis” divide at the first level. At the second level the subjective nature of the therapist and his learning of the field “tints” a diagnosis which does not possess an absolute objectivity as in a deterministic medical framework like heart problem diagnosis subject to the same meta-Gavagai consideration .At the third level the meta-Gavagai gains relevance in a clinical setting in which a patient can in principle never communicate the actual existential nature of his problem but only verbal cues subject to the same indeterminacy as the original problem construct and the choice of language and the manner of language used by the patient determines the entire nature of the diagnosis which may not reflect the underlying reality or the existence of a condition. A step further would be to say that the entire existence of a condition in the DSM is only at the level of language and its self consistency rather than to reflect an objective reality. These trivially place the conditions as a meta- Gavagai construct.

**Results:** Consider the widely empathized condition of depression as it is the most associable and common to imagine. Firstly since depression is “emphatizable “ it is easy to transcend the DSM definition in clinical practice for a “holistic” diagnosis but if we take it as a case and go

strictly by the DSM it is immediately seen that guideline definition of DSM is too narrow and does not take into account the different manifestation of the same. This narrowness is compounded by the subtypes and further classification and the markers for a wrong classification of a specific case is absent without even invoking the meta - Gavagai. In this spirit, if one goes into non associable conditions in which the empathy of depression is lost we find that the road that mislead and cause confusion are numerous creating “a hazy cloud of overlapping conditions which transcend names” like a meta- Gavagai which has a deep relevance to medication and the pharmaceutical aspect.

**Conclusions:** Thus in this communication the Gavagai problem in linguistics and its extension to a Meta-Gavagai highlighted with its reference to psychiatric diagnosis at three main levels is expounded. This communication if explored to it’s full potential and extension would make a case for a rethinking of DSM based psychiatric practice and thus hope is of relevance

**2. IMPLICATION OF LOGOS BASED PSYCHOSIS AND RELEVANCE TO EXISTENTIALISM**

Sriram Balasubramanian

Kalahasti Ashram Knowledge Ventures, Chennai, India

**Introduction/Objectives:** The existentialist ideals and practice leading to a valid existentialist conclusion tend to isolate a person often forcing a venture to explore the nature of psyche that gives raise to the existenia and the nature of being. It is widely documented and agreed that such a venture can give rise to disturbances in the psyche of the individual many a times manifesting as psychosis. In this study it is argued that a genuine pursuit of logos or meaning as that is cherished by the greek philosophers and of many other traditions of antiquity is essentially a personal existential venture and the related intellectual outgrowths of such a thought process have features that resemble modern conception of psychosis. In this study a case is made for isolating such instances of psychosis as existential logos driven and to be accommodated.

**Participants, Materials/Methods:** A gedanken study developing several criteria for acceptance of such psychosis is proposed and the general characterizing features of logos driven psychosis is attempted.

**Results:** In such cases when a perceived existential psychosis no matter how severe which has a strong intellectual, self consistent philosophical or an accepted transcultural basis it is proposed that this be accommodated not as psychosis but as a logos driven existential psychosis. This form of psychosis it is argued is not to be treated as per

conventional european pharmacology as that would interfere with the genuine pursuit of logos which it is argued would manifest in a different form as the ego pursues existential knowledge. In such a case one cant evaluate the precise nature of psychosis from the viewpoint of a outsider due to the internal philosophical thread.

**Conclusions:** The neurobiological implications of such a psychosis is to be studied.

### 3. TWO PHILOSOPHIES OF THE PSYCHIATRIC TREATMENT PARADIGM WITH REFERENCE TO AN ANALOGY OF DIFFERENTIAL AND INTEGRAL CURVE TRACING

Sriram Balasubramanian

Kalahasti Ashram Knowledge Ventures, Chennai, India

**Introduction/Objectives:** A novel comparison is suggested between the mathematical philosophies of integral and differential curve tracing and the paradigm of classical and integrative medicine used in diagnosis and medication of psychiatric illnesses. The analogy is extended to a neurobiological basis highlighting the disease prognosis and the role of pharmacological intervention. The two philosophies of diagnosis are put in perspective with an emphasis on the contrast between temporary perception of psychological disorders as to be diagnosed as per the DSM based diagnostic criteria and when the perceived disorder is a part of a much larger scheme of illness direction and prognosis which is acknowledged and nurtured in the integrative philosophy of psychiatry.

**Participants, Materials/Methods:** Firstly a case is made for the need to consider departures from the classical psychiatric paradigm and the objective relevance of integrative psychiatry. A novel gedanken consideration comparing the philosophy in the approaches of curve tracing ie. integral and differential procedures is applied to the treatment philosophies. The neurobiological picture of the illness prognosis is compared with the two pictures with the specific philosophy of pharmacological interventions in the two cases. Further the exact development mechanism at a neuronal circuit level involvement is studied gedanken-ically with reference to the curve tracing analogy and a case is made for the correlation of the same.

**Results:** There exists a philosophically ingihtful coorelation between the two curve tracing methods and the philosophy of integrative psychiatry and the classical cartesian paradigm of the current model.

**Conclusions:** These considerations make intensive pharmacological intervention debatable as per philosophies.

### 4. USE OF SCREENING CHECKLISTS AND ATYPICAL ANTIPSYCHOTICS IN THE PREVENTION AND TREATMENT OF DELIRIUM IN INTENSIVE CARE UNIT

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**Introduction/Objectives:** Delirium is defined in the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders as a disturbance of consciousness and cognition that develops over a short period of time (hours to days) and fluctuates over time. The prevalence of delirium in Intensive care units vary from 20-80% depending on the illness severity. Despite its high prevalence, delirium is often under-recognized by clinicians due to the difficulty in diagnosis and lack of an easy to use screening tool. Delirium assessment instruments, such as Confusion Assessment Method in Intensive Care Unit and the Intensive Care Delirium Screening Checklist allow nonpsychiatric physicians and other personnel to diagnose delirium faster. Several studies demonstrate that delirium is associated with increased mechanical ventilation days, length of hospital stay, and mortality, all of which lead to increased health care costs. Haloperidol stays the drug of choice for the treatment of delirium.

**Participants, Materials/Methods:** In evaluation of the recent literature we focused on checklists which could be the important tool for the faster recognition and more efficient treatment of delirium. Also, we evaluate the role of atypical antipsychotics, as possible alternative to haloperidol, in prevention and therapy of delirium.

**Results:** There are no reliable published evidences in placebo-controlled clinical trials that confirm that haloperidol reduces the incidence and duration of delirium in critically ill patients. According to some studies atypical antipsychotics may become better alternative. The most frequently used atypical antipsychotic drugs were risperidone, olanzapine, and quetiapine. Based on its pharmacokinetic properties, shorter half-life and simple titration, quetiapine appears to be the best choice. The most common side effects with this class of antypsycotics are: sedation, dry mouth, tachycardia, urinary retention, and constipation (anti-cholinergic effects). The Society of Critical Care Medicine recommend that all critical patients should be routinely evaluated for delirium with assessment instruments or checklists. Some authors implemented a delirium prevention policy with predeliric checklists.

**Conclusions:** Delirium screening checklists are reliable, and should be used in all patients admitted to the Intensive care units. With those checklists diagnosis of delirium may be established earlier which allows rapid treatment. Atypical antipsychotics may be a promising solution in the prevention and therapy of delirium in critical patient.

#### **5. INCIDENCE AND CHARACTERISTICS OF AGGRESSION IN INTENSIVE PSYCHIATRIC UNIT: A LONGITUDINAL STUDY, USING THE STAFF OBSERVATION AGGRESSION SCALE-REVISED (SOAS-R)**

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**Introduction/Objectives:** The prevalence of aggressive behavior in acute psychiatric settings range from 3-15%. During acute hospitalization, the prevalence is significantly higher, from 30-45%. Aggressive events incidence ranges from 0.4-33.2 per year per patient or bed, with the highest incidence in acute settings and departments with a specific population like schizophrenic or involuntarily hospitalized patients. This pilot study aims to assess the incidence and characteristics of aggressive behaviour in hospitalized male psychiatric patients.

**Participants, Materials/Methods** A longitudinal study was carried out over a 4 months period. Aggressive events were recorded regularly by the staff using the Slovenian translation of SOAS-R. Aggressive events incidence was standardized to a bed per year. Severity scores were calculated according to the authors of original SOAS-R. Differences in aggressive events characteristics were evaluated with Chi square or t-test, with p values <0.05 used to determine statistical significance. SPSS was used for data analysis.

**Results:** Aggressive incidents were reported in 23% of patients. A total number of 71 incidents were recorded, resulting in a rate of 11.76 incidents per bed per year. In 82% verbal aggression was presented and 29.6% involved physical aggression. Aggression severity scores ranged from 3-19, with mean of 9.46 (SD=4.306). 67.6% of events were severe (SOAS  $\geq$ 8). There was no understandable provocation in 67.7% incidents, 22.6% incidents were provoked by refusing something to the patient or requiring him to take the medication. The most common targets of aggression were staff members (83.1%), with no consequence for the victim in 49.3%, feeling of threat was presented in 42.3%, and pain, visible injury or need for physician care were present in 5.8% of incidents. Measures to stop aggression involved talking to the patient in 81%, oral or intramuscular medication were used in 25% and

restrictive measures in 46.5% of incidents, mostly in combination with medication. In incidents where restraint was used, SOAS-R scores were significantly higher (mean=11.88, SD=0.652) compared to other incidents (mean=7.37, SD=0.590;  $t=5.14$ ,  $df=69$ ,  $p=0.000$ ). Aggressive incidents were more frequent in patients with the history of substance use disorder ( $\chi=4.774$ ,  $df=1$ ,  $p=0.029$ ), personality disorders ( $\chi=8.904$ ,  $df=1$ ,  $p=0.003$ ) and involuntarily hospitalization ( $\chi=11.587$ ,  $df=1$ ,  $p=0.001$ ). There was no statistically significant difference between the severity of aggressive incidents and factors listed above.

**Conclusions:** Systematic monitoring of aggressive behavior with SOAS-R provide information about aggressive incidents characteristics, enables differentiation between types of aggressive behavior, comparison incidence data and assessment of the effectiveness of interventions to reducing aggression.

#### **6. THE IMPACT OF LONG-TERM LITHIUM TREATMENT ON RENAL FUNCTION IN PATIENTS WITH BIPOLAR DISORDER**

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**Introduction/Objectives:** Long-term lithium administration exerts a "mood-stabilising" effect, preventing recurrences of mania and depression in bipolar affective disorder. Lithium in a form of lithium carbonate has become one of the most effective and widely prescribed drugs for mood stabilization in the treatment of psychiatric disorders. The negative impact of lithium on renal tubular function via decreased concentration function in kidneys to the point of a developed nephrogenous diabetes insipidus symptoms and recently the negative impact on glomerular kidney function is continuously discussed. The aim of this study was to assess the association between long-term use of lithium carbonate and changes of renal functions in patients with bipolar disorder.

**Participants, Materials/Methods:** We assessed kidney function in long-term lithium treated bipolar disorder patients compared with age-matched patients not treated with lithium, including novel markers of kidney damage such as plasma neutrophil gelatinase-associated lipocalin (NGAL), Cystatin C, albuminuria, estimated glomerular filtration rate (eGFR; CKD EPICreat and CKD EPICystat) and serum and urinary osmolality. The study comprised 120 patients with bipolar disorder of which 80 (30 males and 50 females) have been receiving lithium for 2-38 (mean 16) years and 40 (15 males and 25 females) have never been exposed to lithium.

**Results:** Patients treated with lithium had significantly decreased urine osmolality (mean  $\pm$ SD)  $405 \pm 164$  vs  $667 \pm 174$  mmol/kg and U/S osmolality ratio  $1.35 \pm 0.61$  vs  $2.25 \pm 0.96$ . No significant difference was found in eGFR values calculated by the CKD EPICreat, CKD EPICystat, NGAL, Cystatin C and albuminuria between both groups.

**Conclusions:** We found significantly decreased kidney concentration capability in the long-term lithium treated group of patients compared to the control group. Other renal function markers didn't point to any other signs of renal dysfunction despite the long-term lithium treatment duration.

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### 7. SIGMUND FREUD IN THE CONTEXT OF NEUROSCIENCE – A CASE REPORT

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**Introduction/Objectives:** The place and importance of the role of Sigmund Freud is very significant. Motivation is a functional unit with the multifactorial etiology of associated origins. The gain in the neuropsychanalysis is the domain of instincts – inborn drives, and especially in motivation. The understanding of the Freud's Concept of Motivation through neuroscientific prisms and neuropsychanalytic approach is the aim of this paper. Authors conceptualise, describe, analyse, comment on-inter-cross, textualise the motivation and setting of motivation in the neuropsychanalytic sphere.

**Case report:** NN 48 years old man. Due to a series of exogenous factors and conditions of life, he became depressed. The point is in losing motivation for anything. This is one of the symptoms: lost of motivation in depression. Sometimes, in the background of demotivation, lack of interest and weakness of impulse reflected through depression, motives of demotivations should be searched and the treatment of background mood disorders. The healing is quite clear: antidepressants, anxiolytics with accompanying stabilization - hence the procedures in each specific case.

The gain in the neuropsychanalysis is the domain of instincts – inborn drives, and especially in motivation. The volition is one of the main characteristics of the organisation called personality. Freud had his concept of the instances of personality - superego, ego and id. The cardinal foundation of neuropsychanalysis lies in the animal and human instincts. The primary instincts include self preservation and sexuality and for some preponents – aggression, the ego instincts, and „herd or „social“ instincts. Freud also postulated death instincts.

**Conclusions:** Motivation is one of hypothetical processes involved in the determination of behaviour in addiction to the effect of a stimulus or perceived situation, the processes of learning and certainly other factors, such as abilities. Need is generally the fundamental concept of motivation, while a motive or motivation ( in its subjective meaning) denotes the process which leads an individual toward objective. Neuropsychanalytic theory of motivation therefore must be able to explain what a motivating stimulus or a motivation response is and also what happens between stimulus and response.

### 8. AMYGDALA NAA/CR DECREASE MEASURED BY PROTON MAGNETIC RESONANCE SPECTROSCOPY PREDICTS LONGER DEPRESSION-FREE INTERVAL UNDER MAINTENANCE ANTIDEPRESSANT TREATMENT

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**Introduction/Objectives:** The aim of this study was to identify possible early markers of depression-free intervals among biochemicals evaluable by proton magnetic resonance spectroscopy (1H-MRS) in patients with recurrent depression. N-acetyl aspartate (NAA) is considered a putative marker of neuronal integrity and functionality. Choline (Cho) levels mostly result from Cho containing compounds of precursor and breakdown products in membrane phospholipid metabolism. We have earlier reported sustainable NAA and increased Cho levels in dorsolateral prefrontal cortex (DLPFC) at the onset of the recovery phase of the index episode as early markers of antidepressant effectiveness. On the same cohort of patients here we analyse NAA and Cho levels in left amygdala.

**Participants, Materials/Methods:** This research is a retrospective cohort study, where we analysed 1H-MRS parameters in 48 patients with recurrent depression. All subjects received maintenance antidepressant medication at stable dose. Definitions of remission and recovery were based on the standard criterion of a Montgomery-Åsberg Depression Rating Scale (MADRS) score  $\leq 10$ . Patients were clinically evaluated every 6 months and were followed up either to the recurrence of depressive episode or to the start of antidepressant tapering-off. 1H-MRS parameters were evaluated at the start of the recovery phase and 6 months later. Cox proportional hazard analysis was employed to assess neurochemical brain changes as prognostic risk factors for depression recurrence.

**Results:** Five patients were either lost to follow-up or excluded from analysis because of other reasons, so final analysis set consists of 43 patients. Symptoms of depression recurred in 20 subjects. Patients without recurrent episode had a larger NAA/Cr decrease and a higher Cho/Cr increase between two measurements at the beginning of the recovery phase. Time-varying effect was analysed, and the possibility that the change in parameters is caused by imminent subsequent episode was ruled out.

**Conclusions:** NAA decrease accompanied by increase in Cho levels in amygdala at the beginning of the recovery phase is the early marker of antidepressant effectiveness and of the lower risk of depressive episode recurrence. Viewed together with our previously published finding of opposite NAA direction change in DLPFC, the effect of change in NAA as a marker of neuronal integrity and viability may be attributable to the increased brain resilience in patients who will not experience another depressive episode. These results are consistent with the hypothesis of the alteration in limbic-frontal activity in recovery after depressive episode. Acknowledgement: This work has been supported by CSF project IP-09-2014-2979 and ERDF grant CoRE-Neuro.

### 9. TREATING BURNING SENSATION IN DEPRESSION WITH CARBAMAZEPINE AND PREGABALIN

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**Introduction/Objectives:** Historically, sensations without obvious anatomical or neurophysiological origin were labelled as psychopathological and the burning sensation is one of them. Burning sensation could be explained as idiopathic and chronic pain condition associated with high levels of anxiety and/or depression. Also, it would be possible that burning sensation is a somatic feature of depression or symptom of other mental disorders such as anxiety disorder or somatoform disorder. In all mentioned above, it is likely that patients have the tendency reacting to psychosocial distress with physical symptoms. It can be difficult to differentiate somatization versus symptom of medical illness. Also, possibility of central or peripheral neuropathy must be taken into account.

**Case report:** We present 74 year old female patient treated in psychiatric clinic. Patient complained on burning sensations and heat in the body and in the head, bilateral and symmetrical, without following anatomical distribution of a peripheral sensory nerves. Patient was awaking with a burning sensations which were present with moderate intensity in the afternoon and severe intensity in the evening accompanied with negative impact on patient's ability to

perform daily routine and difficulties in falling asleep. Patient also complained of weakness and chronic fatigue. Psychiatric interview and observation revealed depressive mood, anhedonia, low energy, loss of appetite, weight loss and anxiety. Diagnosis of depressive disorder was made and patient was treated with different classes of antidepressants, anxiolytics, classic and atypical antipsychotics, but without satisfactory therapeutic response. Finally, carbamazepine in combination with quetiapine and lorazepam showed good effectiveness, but routine laboratory monitoring revealed leukopenia, thrombocytopenia and elevated values of AST, ALT and GGT so the drug was excluded from therapy. However, pregabalin combined with quetiapine and lorazepam showed effectiveness, favorable tolerability and safety profile and is a good option in treating burning sensations in depressed patient.

**Conclusions:** This report of a patient with prolonged period of symptoms and a long history of unsuccessful treatment showed how challenging is to differentiate whether depression and anxiety are the cause of symptoms such as burning sensations and feeling of heat. It is familiar that anxiety and depression can determine somatization tendencies and that somatic symptoms often may be a feature of depression. We have shown an important role of depression and anxiety in inexplicable somatic or non-specific somatoform symptoms. Differential diagnostic tests (routine laboratory tests, ECG, radiography, ultrasound and computerized tomography) are required, but clinical observation along with clinical experience are the basis of diagnosis and therapy.

### 10. PSYCHOSIS OR/AND PORPHYRIA: A CASE REPORT

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**Introduction/Objectives:** The porphyrias are metabolic disorders in the heme biosynthetic pathway caused by deficiency of some specific enzyme in the pathway. The porphyrias are classified as either cutaneous or acute porphyrias each with specific symptoms. The major manifestations of acute porphyrias are neuropsychiatric symptoms, hormonal changes, medication intolerance, on the other hand the main symptom of cutaneous porphyria is sunlight hypersensitivity. There are few urine and blood tests that are specific enough to be used as a first-line tests when the symptoms imply to the porphyrias.

**Case report:** We present the case of a 50-year old female patient with a symptoms of porphyria. The first symptom that was observed in preadolescence period was tachycardia when the patient was in the near of electromagnetic (EM)

source. During the time there were new symptoms that occurred such as abdominal pain, diarrhoea, muscle weakness, brown urine, breathing problems, sunlight and EM hypersensitivity and medication intolerance (she gets tachycardia even after acetylsalicylic acid consumption). She was also anxious, she presented delusional and bizarre ideas to the psychiatrist and laboratory urine test was ordered to confirm the diagnosis.

The first urine test results have shown significant increase of creatinine coefficient (200  $\mu\text{mol}/24\text{h}/\text{kg}$ ), Coproporphyrin I (48,59  $\text{nmol}/\text{dU}$ ) and some increase of heptacarboxyporphyrin (6,76  $\text{nmol}/\text{dU}$ ). After approximately one month the 2nd urine test was ordered and only creatinine coefficient was increased (181  $\mu\text{mol}/24\text{h}/\text{kg}$ ). The latest urine test was done approximately 4 months later and creatinine coefficient was still increased (181  $\mu\text{mol}/24\text{h}/\text{kg}$ ) and only hexacarboxyporphyrin concentration was significantly increased (8,79  $\text{nmol}/\text{dU}$ ).

**Conclusions:** The patient has a lot of symptoms that imply porphyria but there is no some specific symptom which would make difference between cutaneous or acute porphyria. Furthermore, the first urine test result and symptoms strongly imply that the most likely diagnosis is porphyria. On the other hand the second urine test results have shown that there is no evidence of porphyria although the symptoms were more expressive than before. Finally, the symptoms are still strongly present in the life of the patient and strongly reduce her abilities for normal life and the latest urine test results suggest that porphyria is possible, but it is not completely confirmed. During the whole time of psychiatric treatment the patient presents intolerance to psychopharmacs.

#### **11. HOW DEPRESSION CAN COMPLICATE DIAGNOSES, MONITORING OF COGNITIVE ALTERATIONS AND ACCELERATE ALZHEIMER'S DISEASE PROGRESSION: A CASE REPORT**

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**Introduction/Objectives:** Depression increase probability for Alzheimer disease. Symptoms of depression are part of early disease and complicate progression of illness. Clinical features in young patients can be atypical and can look like frontotemporal dementia when we talk about frontal variant of Alzheimer disease.

**Case report:** We present a case report of a 44- year-old patient treated in psychyatry department because of agitation, anxiety, and concentration problems accompanied

with difficulties in operation and completing the professional tasks. Due to insight in his own status he developed anxiety with noted depression and emotional incontinence. Dominated clinical features were apathy, depression mood, nearly with abulia, with progressive deterioration of mnesic and executive function and extrapyramidal symptoms within the incipient tremor. Results of neurocognitive and neuropsychology tests suggested organic substrate of cognitive disturbance and indicate medium level of dementia with frontal features. Biochemical markers of cerebrospinal liquor and neurofunctional tests point to probable diagnose of early Alzheimer's dementia with high level of evidence. Control examinations monitored changes in personality and behavioral domain. Noted decline of cognitive functions was outside the tolerated range taking into consideration time spell and suggested exacerbation depending on emotional status. Insight of illness and loss of functionality was associated with profound depression, feeling of inanity of life and suicidal ideas.

**Conclusions:** The aim of this work is to present how emotional changes, effect of suppression and loss of initiative can complicate quantification of cognitive loss and contribute to progression of disease.

#### **12. HAPPINESS OF SIXTH-YEAR MEDICAL STUDENTS UNIVERSITY OF ZAGREB - OXFORD HAPPINESS QUESTIONNAIRE**

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**Introduction/Objectives:** Wellbeing refers to diverse and interconnected dimensions of physical, mental, and social well-being that extend beyond the traditional definition of health. It includes choices and activities aimed at achieving physical vitality, mental alacrity, social satisfaction, a sense of accomplishment, and personal fulfillment. Previous studies showed that wellbeing has a major impact on health and performance among medical students. The aim of his study was to assess perceived level of wellbeing and happiness among sixth year medical students at the School of Medicine, University of Zagreb.

**Participants, Materials/Methods:** Study included 212 sixth-year students from School of Medicine, University of

Zagreb aged 23 to 24 in academic year 2017/2018. Out of total number of 6th year students (N=302) 70.2% were involved in the study. Oxford Happiness Questionnaire was used for the measurement of wellbeing and happiness with the questions regarding sociodemographic characteristics of study participants. Data were analyzed by descriptive statistics.

**Results:** Out of total number of students final analysis included 205 (67.9%), out of that 60.0% of females. Study showed that 57.1% of participants were 'rather to pretty happy' with the score 4-5 (51.22% males and 60.98% females). 'Very happy' with score 5-6 were 22.4% of students (23.17% males and 21.95% females). Score 3-4, meaning 'not particularly happy' had 18.1% of students (21.95% males and 15.45% females). 'Somewhat unhappy' were 2.4% students (3.66% males and 1.63% females) with score 2-3. No one was 'not happy at all' or 'too happy'. There was no significant difference between male and female students ( $\chi^2 = 2.79$ ,  $P > 0.05$ ).

**Conclusions:** Our study showed that majority of sixth-year students are 'rather to pretty happy'. The promising fact is that no one scored extreme results, however considering the percentage of participants who scored below 'rather to pretty happy' it is needed to improve the level of happiness among students. Knowing importance of happiness and wellbeing for health and fulfilled life further studies are necessary.

Key words: medical students, happiness, mental health

### 13. HIGH-FAT DIET-INDUCED LIPIDOME PERTURBATIONS IN THE CORTEX, HIPPOCAMPUS, HYPOTHALAMUS, AND OLFACTORY BULB OF MICE

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**Introduction/Objectives:** Given their important role in neuronal function, there has been an increasing focus on altered lipid levels in brain disorders. The effect of a high-fat (HF) diet on the lipid profiles of the cortex, hippocampus, hypothalamus, and olfactory bulb of the mouse brain was investigated using nanoflow ultrahigh pressure liquid chromatography-electrospray ionization-tandem mass spectrometry in the current study.

**Participants, Materials/Methods:** For 8 weeks, two groups of 5-week-old mice were fed either an HF or normal diet (6 mice from each group analyzed as the F and N groups, respectively). The remaining mice in both groups then received a 4-week normal diet. Each group was then

subdivided into two groups for another 4-week HF or normal diet.

**Results:** Quantitative analysis of 270 of the 359 lipids identified from brain tissue revealed that an HF diet significantly affected the brain lipidome in all brain regions that were analyzed. The HF diet significantly increased diacylglycerols, which play a role in insulin resistance in all regions that were analyzed. Although the HF diet increased most lipid species, the majority of phosphatidylserine species were decreased, while lysophosphatidylserine species, with the same acyl chain, were substantially increased.

**Conclusions:** This result can be attributed to increased oxidative stress due to the HF diet. Further, weight-cycling (yo-yo effect) was found more critical for the perturbation of brain lipid profiles than weight gain without a preliminary experience of an HF diet. The present study reveals systematic alterations in brain lipid levels upon HF diet analyzed either by lipid class and molecular levels.

### 14. 5 YEAR REVIEW OF A MULTIDISCIPLINARY TEAM EPILEPSY OUTREACH CLINIC IN AN INTELLECTUAL DISABILITY SERVICE, DUBLIN, REPUBLIC OF IRELAND

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**Introduction/Objectives:** DOC is a disability service within the greater Dublin area in Ireland. All patients attending the outreach clinic are seen by a multidisciplinary team (MDT) comprising; Advance Nurse Practitioner (ANP), Senior Physician, Psychiatrist, and a Neurologist. The outreach clinic was an initiative of the Health Service Executive (HSE) following the introduction of the epilepsy clinical care programme in Ireland. To determine the usefulness/cost effectiveness of the outreach clinic and whether more clinics were warranted at the DOC and nationally, a full review was required. AIM Examine the referral process, the efficiency, and cost effective of this clinic while comparing patient's antiepileptic medication (AED) and seizure characteristics at referral and currently.

**Participants, Materials/Methods:** Reviewed all records on all patients that have attended the outreach clinic since inception in 2013 to February 2018 (DOC patient notes, Electronic Patient Record (EPR) and BH patient file). The data collected was then analysed using the SPSS software.

**Results:** The mean age of the population was 52.8 years (n=71), with 85% being females. 63.4% were in full time campus based residential care, 32.4% in community residential care and 4.2% at home with family. 45.1% discharges including the 7% that died. 63.4% had a

moderate ID. 98% had at least one neurologist review annually, only 3% didn't attend scheduled appointment. 93% had between 3 and 12 clinic reviews (mean= 4.7), excluding, phone contact to the ANP and MDT case discussions. 100% reviewed within 3 months of referral. 38% and 26% had 3 or more seizure types at referral and currently respectively, while 47% and 43% respectively were on greater or more than 3 AED at referral and currently. 31.8% made seizure free during this period, 2.8% fewer patients have >1 seizures per day and those with 1 per year seizures was reduced by 5.7% in the period under study. 16% had comorbid Autism Spectrum Disorder. 80.3% had at least one comorbidity, medical and psychiatric comorbidities accounting for 49.3%. Sodium Valproate was the most commonly used AED both at referral (60%) and currently (52%), then Lamotrigine. 54% are now on a new AED, Levetiracetam accounting for 10%.

**Conclusions:** Disability services will benefit immensely from a dedicated epilepsy outreach clinics onsite to improve epilepsy quality of care, by facilitating a rapid referral process and joint MDT review thereby ensuring continuity of care of this complex group. A national and international rollout is recommended.

### 15. AN FMRI STUDY ABOUT DISEMBODIMENT OF ADULT INTERNET GAME OVERUSERS

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**Introduction/Objectives:** As people become absorbed with online games, they are easily able to forget reality and become more immersed in the game space due to its attractive characters and stimulating scenes. This experience of feeling outside of the physical boundaries of one's body is called 'disembodiment'. The aim of this study was to investigate the difference of brain activity between adult internet game overuser and normal controls in a disembodiment-provoking state.

**Participants, Materials/Methods:** The fMRI images were taken while the internet game overusers and the controls were asked to perform the task composed with ball-throwing animations. The task reflected on either self-agency about ball-throwing or location of a ball. And each block was shown with either different (changing viewpoint) or same animations (fixed viewpoint). The disembodiment-related condition was the interaction between Agency task and changing viewpoint.

**Results:** 1) In within-group analyses, the control group exhibited higher brain activation in left precentral gyrus, left

inferior frontal gyrus, left insula. And the overuser group exhibited higher activation in right cuneus, left posterior middle occipital gyrus, left parahippocampal gyrus. 2) In between-group analyses, the control group exhibited higher activation in right posterior superior temporal gyrus. And the overuser group exhibited higher activation in left cuneus, left posterior middle occipital area.

**Conclusions:** These results show that the disembodiment-related brain activation of adult internet game overusers is different from that of normal persons. If these kinds of disembodiment-related brain activation would be long-lasting, the adult internet game overusers would have serious problems on their identity formation.

### 16. COMORBIDITY OF BIPOLAR DISORDER AND ALCOHOL ABUSE - DIAGNOSTIC AND MANAGEMENT CHALLENGES: A CASE REPORT

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**Introduction/Objectives:** Bipolar disorder (BD) and alcohol use disorder (AUD) frequently present as comorbid entities, which, when combined, are significantly worse than either diagnosis alone in presentation, duration, suicide rate and poor response to treatment. Bipolar disorder diagnosis and initiation of appropriate treatment are often delayed, especially when manic phases are masked with pronounced alcohol abuse.

**Participants, Materials/Methods:** In this case report we show a patient treated in stationary psychiatric care on multiple occasions, alongside regular ambulant psychiatric care due to multiple interchanging episodes of severe depression and mania combined with excessive alcohol use, which actually masked manic episodes early on.

**Results:** Over the course of 24 years, this patient was treated with different combinations of antidepressants, mood stabilizers (atypical antipsychotics included) and anxiolytics to various degrees of success, in addition to psychosocial supportive measures. It is interesting to note that the patient himself blames alcohol abuse for causing his manic phases in the first place, since episodes of excessive drinking generally predated episodes of mania, a finding that could support the recently published retrospective study which suggested polydipsia could be viewed as a precursor of manic episodes in bipolar disorder patients with alcohol use disorder. The course of illness in this patient was marked by progressive slipping on the social ladder. He ruined his marriage, lost his job, caused a traffic accident under the influence of alcohol, ruined his overall health and even served time in jail.

**Conclusions:** The complex nature of the relationship

between alcoholism and bipolar disorder is still not understood enough. It appears that alcohol abuse may worsen the clinical course of BD, which further complicates the treatment. Comorbid addictive disorders, including AUD, are a potentially treatable risk factor, but also a potentially confounding factor in a differential diagnosis of BD. Early detection and intervention is a critical need in BD, and this is more so the case if AUD is also present. Our findings have supported the idea that polydipsia in BD may be a warning sign of a forthcoming manic episode in patients with comorbid AUD. Hypothalamic dysfunction and dysregulated renin-angiotensin system, in addition to hyperdopaminergic activity, theorized to be important factors at play in the basic pathophysiology of BD, could also be the main causes or facilitators of polydipsia in BD.

## POSTERS NEUROLOGY

### 17. HEMOGLOBIN LEPORE SYNDROME AS A RARE CAUSE OF STROKE: A CASE REPORT

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**Introduction/Objectives:** Hemoglobin Lepore syndrome (Hb Lepore syndrome) is a hemoglobin synthesis genetic disorder where hemoglobin is made of two normal alpha globin chains and two deltabeta globin fusion chains. Stroke is a potential complication of this disorder, due to severe anemia. It is present worldwide in individuals from different ethnic groups. But, the three main variants are prevalent in caucasians from the south part of Middle and Eastern Europe.

**Case report:** A 39-year old patient was admitted through the Emergency department due to sudden onset of speech disorder and right limb weakness. In his neurological status there were motor dysphasia, right sided central hemiparesis and hypoesthesia of right side of face and right arm. In the laboratory tests we found mild anemia while coagulation tests were normal. MSCT of the brain showed no ischemic or hemorrhagic changes. MR of the brain showed a recent ischemic lesion in left parietal lobe with discrete older ischemic change in posterior part of right parietal lobe. The patient was from Macedonia by origin and was diagnosed with Hb Lepore syndrome in his youth. In addition, a couple of male family members have the same syndrome. A hematologist was consulted and he recommended regular follow-ups. The clinical course was favourable and the patient was discharged with a normal neurological status.

**Conclusions:** Hb Lepore syndrome is one of the rare causes of stroke or transitory ischemic attacks in younger patients. Silent stroke can be neuroradiologically diagnosed in childhood which enhances risk of symptomatic cerebrovascular incidents in grown up age. A multidisciplinary team of doctors is necessary for timely diagnosis, treatment and further follow-up in patients with Hb Lepore syndrome.

### 18. MEDICATION-OVERUSE HEADACHE IN PATIENTS WITH PRIMARY HEADACHE

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**Introduction/Objectives:** International society of headache in its third edition of the classification (ICHD - III beta) divides headache into primary and secondary. Primary headaches are idiopathic, while secondary are caused by some other illness or external factor like trauma, toxic substances abuse, medication or infection and in multiple cases the cause is not known. Medication-overuse headache (MOH) lasts at least 15 days a month in a time period of three months. The condition for this diagnosis is the patient takes simple analgetic or combined analgetic substances at least 10-15 days a month. It is considered that any medication, if taken for longer than a month, can cause a habit.

**Participants, Materials/Methods:** A retrospective study analyzed patients treated in a polyclinic – consiliary setting of the Neurology clinic in Rijeka in the time period 1.1.2012. – 31.12.2017. 2350 patients with primary headache were analyzed, 291 of which were diagnosed with MOH. 185 patients had diagnosis of migraine, 40 patients had criteria for tension headache, while 10 patients had criteria for trigeminal nerve neuralgia. The remaining 57 patients had some other primary headache. MOH wasn't registered in patients with cluster headache.

**Results:** Patients were using analgetic substances with kodein, triptane substances and other combined analgetics which contained paracetamol or tramadol in addition to NSAID. Patients with trigeminal nerve neuralgia mostly took pregabalin or gabapentin. According to the before mentioned requirement for diagnosing MOH, we got the following results in patients with primary headache in comparison to diagnosis and gender.

**Conclusions:** Out of all patients with primary headache in a 5-year time period, 6.83% had criteria for MOH. In a lot of patients it was impossible to determinate the real data about analgetic overuse. Having that in mind the percentage is probably higher. Most of the MOH patients had migraine (63.57%). Patients with MOH usually took combined

analgetic substances with codein. Addiction was significantly lower with other analgetics. Results don't deviate significantly from results given in literature.

### 19. PERIOPERATIVE MANAGEMENT OF PATIENT WITH AMYOTROPHIC LATERAL SCLEROSIS: A CASE REPORT.

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**Introduction/Objectives:** Amyotrophic lateral sclerosis is progressive degenerative disease of the motor neuron system. Symptoms are muscular weakness, atrophy, fasciculations, spasticity and hyperreflexia. Bulbar symptoms include dysphagia and tongue fasciculations, frequently lead to pulmonary aspiration and pneumonia. Eventual respiratory muscle failure make disease fatal. Anesthesia in these patients is very demanding. General anesthesia may be associated with exaggerated respiratory depression. Depolarizing muscular relaxants may cause fasciculations and severe hyperkalemia. Non-depolarizing muscular relaxants have prolonged effect. Regional anesthesia may exacerbate symptoms of disease.

**Case report:** We report a case of 75 years old female patient with amyotrophic lateral sclerosis who underwent urgent choledochotomy because of inflammation of ductus choledocus and development of biliary sepsis. She has been diagnosed with amyotrophic lateral sclerosis one year ago, and at the moment of surgical procedure she suffered from partial respiratory insufficiency. Neurologic exam revealed signs of lesion of both upper and lower motor neuron and bulbar signs like dysarthria and rightsided hemiparesis as a result of stroke 14 years ago. General anesthesia used for the surgical procedure included a reduced dose of non-depolarizing muscular relaxant rocuronium, which is normally metabolised within one hour. However, she required mechanical ventilation for 58 hours postoperatively, probably due to her damaged respiratory function associated with amyotrophic lateral sclerosis. Also, her neurological status slightly deteriorated. After prolonged mechanical ventilation, she was extubated and started to breathe spontaneously. Neurological and respiratory functions were observed for two more days in the Intensive

care unit. The patient was transferred to the surgical ward after additional exams from neurologist and pulmologist, which confirmed that her clinical status was satisfied. Unfortunately the patient died four days after being transferred to the surgical ward. The cause of death was not verified because patient's family reject autopsy.

**Conclusions:** Perioperative management of patients with amyotrophic lateral sclerosis necessitate careful planning and collaboration of different medical specialities. Urgent surgical procedures under general anesthesia in patients with this disease are associated with higher morbidity and mortality.

### 20. BIOMARKERS OF STROKE

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**Introduction/Objectives:** Suitable biomarkers that have prognostic values are one of the key points of interest in ischaemic stroke. Increased sympathetic nervous system activity in ischaemic stroke causes multiple local and systemic effects that can be detrimental to the outcome. The mechanism of action is increased secretion and activity of catecholamines, whose end metabolic products are vanillylmandelic acid and homovanillic acid. Our study aimed to determine whether these compounds can be used as potential prognostic biomarkers in ischaemic stroke, as a unique insight into the activity of the sympathetic nervous system.

**Participants, Materials/Methods:** Urine samples of 96 patients with ischaemic stroke and transitory ischaemic attacks were analyzed. Values of vanillylmandelic and homovanillic acids in urine were tested using liquid chromatography on the first and third-day post-stroke. The severity of stroke was determined using the NIHSS scale, while the functional outcome was determined using the Modified Rankin Scale.

**Results:** Values of vanillylmandelic and homovanillic acids positively correlated with the functional outcome of ischaemic stroke. Favourable outcomes correlated with decreased values, on the contrary to increased values, which were associated with unfavorable outcomes.

**Conclusions:** Determining the values of these compounds in the urine is an easily available prognostic tool for the ischaemic stroke outcome, while also influencing potential therapeutic changes.

## 21. THERAPY WITH PLANTS AS A NEURO PHYSICAL REHABILITATION

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**Introduction/Objectives:** The profession of plants therapy, gardening or horticultural therapy is one of the treatment modalities (including therapies such as art, music and recreational) that form the adjunctive therapy treatment approach. Plants therapy programs are commonly found in physical rehabilitation facilities, psychiatric hospitals, educational centers for individuals with intellectual defects and similar treatment facilities. Specialized populations for plant therapy practice: stroke and traumatic brain injury, mental illness, older persons and plant therapy practice, community gardening: design, techniques and tools, consultation services for plant therapy practice, applied research for plant therapy practice.

**Participants, Materials/Methods:** Plant therapy frequently is used as the catch-all phrase applied to anytime, anyone gardens and feels better, acts better, or gets better under any conditions. The restorative value of views of plants and nature also have been lumped into plant therapy, as has the social value of community gardening. Therapy with flowers is a very important aspect of human interaction with plants and is rapidly growing profession. Annuals are very popular in gardens for many reasons. They are generally easy to grow, fast blooming plants which can provide quick, if only temporary, color to the garden. The wide selection within many varieties provides diverse colors, flower types and sizes from which to choose. An annual can be found to suit almost any garden need.

**Results:** Furthermore, she starts to experience three things symbolically, learning that other things need support, gaining an interest in supporting a plant and therefore she's being useful to another living thing and she (and by implication, others) feels it is genuinely worthwhile to aid in the support of others who literally cannot stand alone. The individual gains many new abilities as he learns the techniques and methods of horticulture such as plant propagation, gardening and flower arranging. They improve vocabulary and communication skills. Participants in the program learn new terms as well as new concepts.

Horticulture arouses sense of curiosity.

**Conclusions:** In defining plant therapy as a profession, it is useful to look at the definitions of allied professions, such as neurorehabilitation, physical therapy (PT) and occupational therapy (OT), that use a medical model in their approaches to treatment. It is not necessary to have expensive facilities or a large garden to initiate a successful horticultural therapy

program. With imagination and initiative even the most limited facilities can be modified to accommodate horticultural activities. By observation of plant growth and change, man learns about life and acquires an understanding that can be applied to other aspects of life.

## 22. ANTIMICROBIAL SUSCEPTIBILITY OF THE MOST COMMON PATHOGENS ISOLATED FROM URINARY TRACT INFECTIONS IN STROKE PATIENTS

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**Introduction/Objectives:** Stroke is one of the leading causes of morbidity and mortality worldwide. It is often followed by complications, especially infections. Pneumonia and urinary tract infections (UTIs) are the most common post stroke infections that lead to poor clinical outcome. Patients with stroke are particularly vulnerable to UTIs due to increased risk from immunosuppression, bladder dysfunction, and increased Foley catheter use. *Escherichia coli* (*E. coli*) is the most common pathogen isolated from urinary cultures. Other *Enterobacteriaceae* are also common such as *Klebsiella*, *Proteus*, *Pseudomonas*. Clinicians often choose empirical antimicrobial therapy for urinary infections treatment. Inappropriate use of antimicrobials leads to the development of resistant microorganisms and failure of therapy.

The aim of this study was to determine the prevalence and antimicrobial susceptibility of the most common microorganisms isolated from the urinary tract infections in stroke patients.

**Participants, Materials/Methods:** In this retrospective study, we have selected 307 patients from the hospital information system who were treated in our Hospital for diagnosis according to the MKB diseases codes I60- I69, over a two year period. We have processed urine culture results taken after stroke. Identification and antimicrobial susceptibility of urinary pathogens were determined according to standard laboratory protocol. Culture samples were recorded as positive when uropathogens were detected at  $\geq 10^4$  colony forming units (CFU)/ml for urine catheter samples regarding to midstream urine samples at  $\geq 10^5$  CFU/ml.

**Results:** In this study, we processed 110 (36 %) male and 197 (64 %) female patients. The median age was 78. Urinary catheters were placed in 138 patients (45 %). Out of the 307 urine samples submitted, 80 samples (26 %) were positive for bacterial growth. The most common isolate was *E. coli* (37.5 %). Antimicrobial susceptibility of *E. coli* was the highest to carbapenems (100 %), piperacillin-tazobactam (100 %), third and fourth generation cephalosporins (90 %).

The resistance rates were the highest to ampicillin (53 %) and cotrimoxazol (33 %).

**Conclusions:** Urinary tract infections remain a common occurrence in stroke patients. The overall prevalence of UTIs in our study was 26 %. These regional resistance data can help to clinicians to select appropriate empirical antimicrobial therapy.

### 23. SPONTANEOUS DISSECTION OF THE INTERNAL CAROTID ARTERY A LATE VASCULAR COMPLICATION AFTER BREAST CANCER RADIATION: A CASE REPORT

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**Introduction/Objectives:** Radiation-induced dissection is an uncommon late complication of radiotherapy.

**Case report:** We present the case of a 52-year-old woman who developed internal carotid artery dissection seven years after mastectomy and radiotherapy. Initial examination revealed soreness on the left side of the neck. Carotid color Doppler flow imaging identified a subintimal hematoma in the enlarged left carotid bulb. She was treated with acetylsalicylic acid and statin. Forty-five days after, carotid ultrasound showed complete resorption of the hematoma.

**Conclusions:** Doppler ultrasound is crucial for the diagnosis of carotid artery dissection due to its accessibility, promptness, and noninvasiveness.

### 24. CAROTID ARTERIES STENOSIS IN FOLLOW UP STUDY OF DIABETES PATIENT

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**Introduction/Objectives:** In the follow-up study of subjects with diabetes mellitus (DM), we present results obtained by adding new parameters to the original study data. In 2014, a cohort of 160 subjects with DM was formed, consisting of diabetics (D group; N=80) and diabetics with painful neuropathy (PN group; N=80).

**Participants, Materials/Methods:** Besides routinely monitoring the subjects as a part of the follow-up study (estimated to end in early 2019), we have added a number of new parameters to the original dataset. The two newly added parameters presented here are waist circumference (CW, in cm) and stenosis of internal carotid artery (ACI, in %),

which were collected for 72 of the original 160 subjects (38 subjects in D and 34 in PN group, respectively).

**Results:** The two variables (CW and ACI) were neither correlated ( $p=0,163$ ), nor significantly different between the two study groups ( $p=0,669$  and  $p=0,961$  for CW and ACI, respectively). However, the difference was found between subjects with DM type I vs. those with DM type II. Although subjects with DM I had on average longer duration of the illness compared to those with DM II (25,0 vs 16,9 years, respectively;  $p=0,001$ ), ACI was on average significantly more pronounced in the latter group (43% vs 36,7%, respectively;  $p=0,022$ ). Waist circumference was (expectedly) strongly and positively correlated to BMI ( $r=0,83$ ;  $p<0,001$ ), but also to HDL ( $r=-0,51$ ;  $p<0,001$ ) and systolic blood pressure ( $r=0,37$ ;  $p=0,036$ ). Since subjects were also tested by means of SF-36 scale, BDI questionnaire and LANNS neuropathic pain scale, we were able to correlate these results with newly obtained variables. CW was thus negatively correlated with the mental health (MH) domain of SF-36 ( $p=-0,43$ ;  $p=0,017$ ) and positively to the Beck score ( $r=0,41$ ;  $p=0,023$ ). However, for the stenosis ACI, the only correlation which was found significant is the one with the age of the participants ( $r=0,47$ ;  $p=0,013$ ).

**Conclusions:** In conclusion, described parameters have added some potentially valuable information to the follow-up study of our subjects. A more robust regression analysis is provided in the full text, discussing the place of these values in the long-term study of DM.

### 25. LIMB-GIRDLE MUSCULAR DYSTROPHIES AND MAGNETIC RESONANCE: A CASE REPORT

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**Introduction/Objectives:** The limb-girdle muscular dystrophies (LGMDs) are a group of genetically heterogeneous muscular dystrophies that share a similar clinical phenotype. They manifest as progressive weakness of hip and shoulder girdles with a childhood to adult onset. It is classified into two major categories: LGMD type 1- autosomal dominant; and LGMD type 2- autosomal recessive. Thirty-one loci have been identified, out of which eight autosomal dominant and 23 autosomal recessive. Achieving a precise diagnosis of a particular subtype of LGMD may be difficult and requires comprehensive medical history and clinical examination, laboratory, genetic tests and muscle biopsy.

**Case report:** A 50-year-old man was presented with gradually progressing proximal-dominant upper and lower limb atrophy and weakness. He noticed that he had difficulty walking for the past couple of years, and for a year has had trouble keeping his hands in the elevated position. He had no difficulty in his childhood with sport activities. Previously, he was cardiologically treated for atrial fibrillation.

Neurological status: there is a present waddling walk, the patient cannot stand up from the squat position, with the present muscle atrophy of the upper arm, the shoulder belt and the abdomen. Creatine kinase (CK) level was high (1,046) Alpha-glucosidase levels were normal.

Electromyography showed a myopathic pattern. Magnetic resonance (MR) showed the elevation of signal in T1 sequences in muscles: gluteus maximus, vastus lateralis, intermedius, semimembranosus, semitendinosus, biceps femoris, adductor magnus and longus

**Conclusions:** MR is a useful non-invasive diagnostic methods in muscular dystrophies and subtypes of LGMDs which provides us additional information about distribution of affected muscles.

## 26. RECURRENCE OF POLYRADICULONEURITIS (GUILLAIN - BARRE SYNDROME) IN THE DEPARTMENT OF INTENSIVE NEUROLOGICAL CARE: A CASE REPORT

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**Introduction / Objectives:** Guillain-Barré syndrome is an autoimmune inflammatory polyneuropathy that leads to progressive flaccid weakness of the muscle and in severe cases it can result in respiratory insufficiency and autonomic dysfunction that may resolve with bad outcome of high mortality. Here is illustrated the case of the patient with severe recurrent polyradiculoneuritis treated in the department for intensive neurological care.

**Case report:** In January 2017, with no previous medical history, 53-year-old man was admitted on the Department of Neurology due to acute onset of flaccid muscle weakness of all four limbs. Anamnesis and clinical status indicated acute polyradiculoneuritis, which was confirmed with cerebrospinal fluid analysis and electromyoneurography. On the fifth day of hospitalization he developed bilateral facial paralysis, progression of muscular weakness with signs of disautonomy. He was treated with plasmapheresis 6 times. The therapy lead to partial motoric recovery but due to the development of fever it was abandoned and replaced with

intravenous immunoglobulins (0.4 g/TT/day). After the therapy, he was transferred to the Department of Physical Rehabilitation. After 15 days of rehabilitation he developed swallowing difficulties and was returned to the Department of Neurology. Respiratory insufficiency developed rapidly and he was transferred to the Department of Intensive Neurological Care where he underwent endotracheal intubation and was introduced on controlled mechanical ventilation. Due to autonomic dysfunction and arterial hypotension he was treated with vasoactive support and antiarrhythmics due to atrial fibrillation and supraventricular tachycardia. Due to urinary retention, UC was set up. The control EMNG finding on the 67th day of hospitalization indicated a recurrent polyradiculoneuritis for which he received a booster dose of immunoglobulin (0.2 g/TT/day). Urinary tract infection, sepsis, acute tracheobronchitis and bilateral pneumonia were treated with targeted antimicrobial therapy. Percutaneous dilatative tracheotomy was performed on the 53rd day of hospitalization. He was taken off from the respirator on 180th day, on 202nd day endotracheal cannula was removed and he started breathing independently. When the act of swallowing was reinstated, nasogastric probe was removed. On September 07 in 2017 with a regular findings of cranial nerves, severe flaccid weakness of the arms and legs, skeletal muscular atrophy and cachexia he was sent to stationary medical rehabilitation.

**Conclusions:** Patients with severe form of recurrent polyradiculoneuritis required treatment in the department of intensive neurological care due to need for long-term controlled mechanical ventilation, percutaneous dilatative tracheotomy, adequate nutrition, autonomic dysfunction control and targeted antimicrobial therapy which, with specific plasma and immunoglobulin therapy, that influence outcome of severely ill patients.

## 27. THE CORRELATION BETWEEN COGNITIVE DISORDERS AND CLINICAL PARAMETERS IN MULTIPLE SCLEROSIS PATIENTS

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**Introduction/Objectives:** Cognitive disorders have been known to accompany Multiple Sclerosis (MS) since the first clinical descriptions of the disease. Recent investigations, however, have demonstrated the presence of cognitive dysfunction from the very early stages of the disease known

as Clinically Isolated Syndrome (CIS), and it is a major cause of both job loss and also of having a great negative impact on the quality of life of patients and their families. For the identification and management of cognitive disorders in MS, the appropriate neuropsychological tools are required to be wielded in tandem with exploring other clinical indicators of the disease, as well as neuroimaging findings and biomarkers measurements.

**Participants, Materials/Methods:** We examined 6 patients with CIS, 22 with relapsing remitting MS, 4 with secondary progressive MS, and 5 with primary progressive MS. We used the following neuropsychological battery: California Verbal Learning test (CVLT), Symbol Digit Modalities Test (SDMT), Brief Visuospatial Memory Test and Paced Auditory Serial Addition Test (PASAT).

**Results:** The statistical analysis of the results demonstrated a robust correlation between the worse performance in the CVLT and the progressive forms of the disease. The performance in the CVLT was also found to correlate with the patients' age and their degree of disability, as evaluated by use of the Expanded Disability Status Scale (EDSS). There was also a significant correlation between EDSS and SDMT and PASAT performance. In contrast, the sex of the subjects as well as the disease's time of onset did not show a statistically significant correlation.

**Conclusions:** Our results indicate that the currently available battery of neuropsychological tests can be used as a reliable tool in the diagnosis of cognitive deficits of MS patients, as related to their degree of disability and to the type of their disease. However, evaluation of cognitive functions should be also incorporated in the regular assessment and monitoring of MS patients since they seem to be well correlated with the progression of the disease.

## 28. CAN INTERMITTENT PNEUMATIC COMPRESSION BE AN EFFECTIVE TREATMENT FOR LOWER LIMBS OEDEMA IN MULTIPLE SCLEROSIS PATIENTS AT REDUCED MOBILITY?

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**Introduction/Objectives:** Many neurological diseases lead to progressive motor dysfunction along with long-term consequences due to the loss of mobility. Hypo-mobile patients, incapacitated or wheelchair-bound for extended periods of time with their legs hanging down, can develop an impairment of the venous and lymphatic return. In addition, in some neurological disorders, the impairment of the autonomic reflexes on vascular functions could also have a role in affecting the venous system functioning. As a result, many patients affected by loss of mobility experience a lower limb oedema, impacting their general condition and

raising thrombotic risk. The intermittent pneumatic compression (IPC) is a non-invasive technique based on the application of inflatable sleeves exercising sequential and intermittent pressures reproducing the same physiological mechanism of the calf muscle pump during walking. We aimed to evaluate the efficacy of IPC in a sample of multiple sclerosis (MS) patients at reduced mobility with lower limbs oedema.

**Participants, Materials/Methods:** Sixteen MS patients, which were included in a pilot, single blinded, two-arm, parallel group, randomized, controlled clinical trial, were analysed. Patients were randomly allocated in an experimental group (IPC group, n=10) undergoing an in-home cycle of IPC twice a day, each session lasting 50 minutes, with a setting of 50 mmHg pressure, for 30 consecutive days, and a control group (C group, n=6). Legs oedema was evaluated at baseline and after one month by an investigator blinded to the patients' allocation measuring subcutaneous thickness (high-resolution ultrasonography) and circumferences (metric tape), both assessed at different levels of the lower limbs. Ankle range of motion (ROM) was also measured, by means of a goniometer.

**Results:** All patients of the IPC group completed the treatment. No adverse events were reported. Oedema significantly decreased in IPC group (for all outcome measures  $P=0.02$ ) while significantly increased in C group ( $P=0.03$ ). Ankle ROM significantly enhanced in IPC-group (dorsiflexion,  $P=0.02$ ) and remained stable in C-group.

**Conclusions:** In a sample of MS patients at reduced mobility with legs oedema an IPC treatment was well tolerated and effective in reducing the oedema and improving the ankle ROM. In hypo-mobile MS patients IPC might be considered a valid approach to treat limbs oedema, to prevent skin changes, to reduce the risk of thromboembolism and, additionally, a complement to support physical therapy. Further studies in a larger sample are needed to confirm our results and to investigate different acute and long-term effects.

## 29. MIGRAINE - A SECONDARY HEADACHE CAUSED BY THE UPPER CROSSED SYNDROME

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Migraine headaches represent a universal problem affecting millions of people worldwide. It is pain in the head or neck region and can be a symptom of a number of different conditions disturbing the pain-sensitive structures around the brain, which are head and neck are the cranium, muscles, nerves, arteries and veins, subcutaneous tissues, eyes, ears, sinuses and mucous membranes.

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Cervicogenic headache is pain perceived in the head, caused by musculoskeletal tissues innervated by cervical nerves. The pain is commonly unilateral, lasting from hours to weeks, moderate intensity, spreading into frontal, temporal, and orbital regions. Degenerative changes of cervical spine and upper cervical joints are also associated with pathophysiology of cervicogenic headaches, by causing lack of movement and dysfunction causing irritation to pain-sensitive structures. Pain characteristics may be similar to migraine headaches by its intensity, unilateral involvement, nausea, vomiting, and even ocular symptoms. However, cervicogenic headache never changes sides, and originates from the neck.

Careful and exact diagnosis is extremely important due to treatment differences of different types of headaches. There are several effective exercises suitable for effective pain relief. Regular exercise will help you avoid unpleasant headache and postpone the need for medical treatment. It will also reduce pain by restoring muscle function, optimizing posture to prevent muscle overload, and increasing the strength and endurance of your neck muscles.

### 30. CT IN EMERGENCY DEPARTMENT IN PATIENTS WITH HEADACHE WITHOUT FOCAL NEUROLOGICAL ABNORMALITIES

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**Introduction/Objectives:** Headache is a common reason for presentation in emergency department (ED). The aim of this research was to determine the incidence of positive computed tomography (CT) findings in patients with headache without focal neurological abnormalities in ED.

**Participants, Materials/Methods:** The results of the native CT scans in ED were retrospectively analyzed. Exclusion criteria included: focal neurological abnormalities, previous head trauma, underlying malignancy, brain metastasis, previous brain operation, dizziness, fever, nausea, vomiting, coagulopathy. As a clinically significant finding we took into account tumours, hemorrhage and acute ischemic lesion. 108 patients met these criteria. The age range was from 18 to 87 years, with mean of 49.5 years, 63% of the patients were female and 37% were male.

**Results:** Normal CT findings were found in 82 patients (75.9%). 26 patients (24.1%) had pathological findings, out of that number 17 (15.7%) findings were clinically irrelevant and 9 (8.3%) were clinically significant. Out of the 9 clinically significant findings, tumor process was

found in 5 (4.6%) patients, hemorrhage was found in 3 (2.8%) patients and ischemic lesion was found in 1 (0.9%) patient. In two patients with hemorrhage a subarachnoid hemorrhage was found, with an incidence of 1.8%. All of the 9 clinically significant findings were further evaluated by MR and/or CT angiography and in 2 cases there was a change in initial CT diagnosis but without any change in the category of outcome.

**Conclusions:** Our research revealed 8.3% of clinically significant emergency examinations in patients with headache without focal neurological abnormalities.

### 31. A CASE REPORT OF FACIAL NERVE PALSY ASSOCIATED WITH VARICELLA INFECTION

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**Introduction/Objectives:** Neurological complications caused by varicella are estimated to occur in approximately 0.01-0.03% of infections. Frequent complications are cerebellar ataxia and encephalitis while the rare complications are facial paralysis, transverse myelitis, aseptic meningitis, Guillain-Barre syndrome, ventriculitis, optic neuritis, peripheral motor neuropathy, cerebral angiitis and Reye's syndrome. Facial palsy can be a result of preeruptive hematogenous or neurogenous spread of varicella zoster virus. Objectives: Review the case of acute peripheral facial palsy as a rare complication of varicella.

**Case report:** A 3-year-old girl presented with a 5-day history of fever and widespread vesicular/pustular rash typical for varicella with clinical signs of secondary bacterial infection of skin, and we clinically confirmed diagnosis of impetigo as a varicella complications. The fifth day after the rash appears she developed inability to close left eye and facial asymmetry with the lower left corner of the lips. There was no clinical history of retroauricular pain, hyperacusis, decreased production of tears and altered taste. Complete neurological examination revealed left peripheral facial nerve palsy without any abnormal features. The diagnosis facial nerve palsy associated with varicella was based on clinical, laboratory and neurophysiological findings. Aside from local therapy and antibiotic clindamicin for 7 days, patient was treated with acyclovir 10mg/kg IV q8h for 7 days and oral prednisolone (1 mg/kg q24h) in tapering doses for 2 weeks. In the third week follow-up complete recovery of neurological deficit was noted.

Hematological–biochemical tests registered a mild increase inflammatory markers and neutrophilia, until liver and kidney enzyme analysis were within reference range. Lumbar puncture obtained first day of admission and CSF

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analysis showed mononuclear pleocytosis (108 white cell/mm<sup>3</sup>, 86,4 % lymphocytes), glucose and protein level was in normal range. CSF cultures for bacteria, fungus and tuberculosis were negative. Serological test for B. burgdorferi was nonreactive. The patient had a bilateral type A tympanogram, stapedial reflex was absent in the left ear. Ocular fundus (FOU) was normal.

**Conclusions:** We suggest that, aside from a frequent central nervous complications, children with varicella should be monitored closely for facial nerve palsy as well. The prognosis of facial palsy due to varicella is generally good and 80% cases recover with or without treatment, but specific acyclovir and prednisolone therapy may accelerate the complete recovery like in our case. Keywords: facial nerve palsy, varicella

### 32. DISTINGUISHING SLEEP MOVEMENT DISORDERS FROM SEIZURES: A CASE REPORT

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**Introduction/Objectives:** There is a close and complex association between sleep movement disorders and epilepsy. The common characteristics are abnormal paroxysmal motor movements during sleep and excessive daytime sleepiness. Periodic limb movement disorder (PLMD) is diagnosed based on clinical history of sleep disturbance or day fatigue, combined with polysomnography (PSG) showing an excessive number of periodic limb movements of sleep (PLMS), and exclusion of alternative causes of the sleep complaints.

**Case report:** A 37-year-old, previously healthy male, was referred to the epilepsy service due to the symptoms that lasted for previous four years, including an intermittent sense of loss for a few seconds preceded by a sense of tiredness and pressure in the head, more frequent while driving a car (once he was found near the highway in the grass). On one occasion, his wife noticed that during the conversation he stopped listening and his eyes closed. Convulsive elements, tongue bite and losing control of urine were denied. For the purpose of clarifying the clinical picture, continuous video-EEG polygraphic monitoring has been performed, showing a normal electroencephalographic finding, while periodic limb movement during sleep were observed. Brain MRI and laboratory findings revealed no abnormalities. Subsequently performed PSG confirmed the diagnosis of PLMS (PLMI 31.5) and moderate postural sleep apnea (AHI 13.2 on the backs vs. 2.3 on the right side). Anamnestic data, as well as Cambridge-Hopkins diagnostic questionnaire, also referred to the associated restless leg syndrome. The symptoms were evaluated as a

result of excessive daily sleepiness with impaired quality of life (Epworth sleepiness scale 14). Pramipexole, trazodone, adequate sleep hygiene, moderate exercise and position therapy during sleep were recommended in the treatment. Six months later, control PSG was performed showing improvement (PLMI 15.4, Epworth 9, AHI 7.9) which was also expressed by patient who denied any other subsequent unconsciousness and drowsiness events, with the reduction of subjective symptomatology of restless leg syndrome.

**Conclusions:** In differentiating seizures from sleep disorders and associated movement disorders, apart from a detailed history, the role of video-EEG monitoring is crucial as well as subsequent confirmation by PSG.

### 33. EAGLE SYNDROME IN A PATIENT WITH STROKE

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**Introduction/Objectives:** Eagle syndrome (ES) presents a set of symptoms associated with an elongated styloid process (>25 mm). There are two main presentations of this syndrome. The first one is classic, with a symptomatic compression of neighboring structures, causing unilateral sore throat, dysphagia, tinnitus, unilateral facial and neck pain. The second one is uncommon, vascular or stylocarotid form, due to direct vascular compression, or by dissection of internal carotid artery (ICA) and thromboembolism, causing cerebrovascular symptoms such as visual loss, motor weakness, aphasia, and syncope. The etiology is unclear. Genetic predisposition, surgical trauma, local chronic irritation, early onset of the menopause, rheumatic and degenerative changes could cause osteitis, periosteitis and tendonitis of the stylohyoid complex with consequent reactive, ossifying hyperplasia.

**Case report:** We present a 51-year-old male, with previous history of recurrent strokes, arterial hypertension and rheumatoid arthritis, who suffered from a sudden dysarthria, left-sided hemiplegia and hemihypoesthesia, assessed as a score of 19 on the NIH stroke scale (NIHSS). Brain CT showed the signs of chronic cerebrovascular disease, with no acute lesion. The patient received intravenous thrombolysis. Initial ultrasound examination and CT angiography showed complete occlusion of the cervical portion of the right ICA whilst the consecutive showed the signs of early recanalization and a dissection with a small pseudoaneurysm. The styloid process on the right side was

assessed as elongated with calcified stylohyoid ligament which corroborate the diagnosis of vascular ES. Subsequent brain CT showed acute infarction in the right middle cerebral artery territory. Secondary prophylaxis with acetylsalicylic acid was continued, followed by neurological improvement. Patient was discharged with slight left-sided hemiparesis to rehabilitation center, NIHSS score of 4. Three months later, follow-up CT angiography showed dissected lesion of right ICA in the length of 29 mm and the patient was referred to maxillofacial surgeon for resection of styloid process.

**Conclusions:** Classic ES is relatively common and it is well recognized by otorinolaryngologist. Vascular ES is often underdiagnosed as a cause of carotid artery dissection and subsequent stroke or other cerebrovascular complications. ES should be considered as a cause of carotid artery dissection, especially in the group of patients with predisposing factors, like our patient who has the history of recurrent strokes and rheumatoid arthritis. CT scanning is a gold standard in confirming the diagnosing of ES and evaluating the styloid process in relationship to other head and neck structures, which is of crucial importance in regard to surgical planning.

#### 34. PRELIMINARY REPORT OF THE MULTI-DIMENSIONAL NATURE OF SEXUAL PROBLEMS IN MULTIPLE SCLEROSIS PATIENTS

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**Introduction/Objectives:** Multiple sclerosis (MS) is a chronic, inflammatory, demyelinating disorder of the central nervous system that results in a wide range of clinical manifestations, including sexual dysfunction (SD). SD in MS patients may result a complex set of conditions and may be associated with multiple anatomic, physiologic, medical and psychological factors. Since MS primarily affects young people, SD secondary to MS may have a great impact on quality of life. The aim of this study was to determine the multi-dimensional nature of sexual problems in MS patients.

**Participants, Materials/Methods:** In this research was analysed data on 20 MS patients, which included 9 women and 11 man (average  $40.20 \pm 11.95$  years) which underwent neurological care at Clinical Hospital Centre Osijek. The mean score of Expanded Disability Status Scale (EDSS) was 3 (EDSS range 0-8). Our research problem was examined using the Multiple Sclerosis Intimacy and Sexuality

Questionnaire-15 (MSISQ-15). MSISQ-15 includes three SD subscales: primary - MS related neurologic changes that may directly affect sexual feelings and/or sexual response; secondary - MS related physical changes that affect the sexual response indirectly; and tertiary - referred to the psychosocial and cultural aspects of MS that affect sexuality. The data was descriptively analysed and Chronbach's  $\alpha$  assessed internal consistency. Pearson r correlations were performed on the three subscales of the MSISQ-15. The level of significance was set to  $p < 0.05$ .

**Results:** The means score for MSISQ-15 total scale, primary, secondary and tertiary subscales were  $26.50 \pm 9.40$ ,  $9.65 \pm 4.49$ ,  $9.60 \pm 3.56$  and  $7.25 \pm 3.67$ , respectively. Cronbach's  $\alpha$  for the MSISQ-15 scale total score using the entire sample was 0.85, indicating high internal consistency. The Cronbach's  $\alpha$  for each of the subscales is as follows: primary, 0.79; secondary, 0.73; and tertiary, 0.81. The primary subscale was moderately correlated with the secondary subscale ( $r = 0.53$ ). Similarly, the secondary and tertiary subscales were moderately correlated ( $r = 0.47$ ). The total scale was highly correlated with the primary ( $r = 0.83$ ), secondary ( $r = 0.81$ ), and tertiary ( $r = 0.76$ ) subscales.

**Conclusions:** These results show that the MSISQ-15 subscales have a desirable pattern of correlations. They are associated with each other only moderately, and therefore measure distinct constructs.

#### 35. FIRST PSYCHOTIC EPISODE IN A PATIENT WITH MULTIPLE SCLEROSIS

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**Introduction/Objectives:** Multiple sclerosis (MS) is a chronic inflammatory disease of the central nervous system (CNS) characterized by progressive demyelination. It can affect any part of the CNS but has a predilection for the white matter tracts of the cerebral hemispheres, optic nerves, brainstem, cerebellum, and spinal cord. Psychotic features in the context of MS occur rarely but are far from insignificant, with reported prevalence rates two to three times higher than those found in the general population. Our objective is to present one such case.

**Participants, Materials/Methods:** Our poster shows a female patient whom we treated psychiatric stationary due to first acute psychotic episode presented with suicidal behavior, fear and paranoid thinking. During treatment we consulted neurologist and radiologist and we did a neuroradiological imaging of the brain with the help of MRI with contrast which showed fresh and active 3 mm big demyelination lesion in the right frontal lobe and 4 mm big demyelination lesion in the semioval center in regards to the

patients' last MRI scan. Our findings confirmed that it was an exacerbation of MS.

**Results:** The patient was treated with Risperidone and Diazepam in the psychiatric ward until psychotic symptoms started fading away to the point where the patient was able to be transferred to the neurological ward. There she continued to receive her corticosteroid therapy with Methylprednisolone until MS was put under control. Two months after stationary hospital treatment the patient is on Risperidone, without psychotic symptoms and she is functional in her normal daily activities. The only thing that the patient is complaining about is poor tactile sensation in her left arm due to MS.

**Conclusions:** Psychosis in the context of MS is a relatively uncommon neuropsychiatric presentation when compared to affective disorders and cognitive impairment in MS. It has a massive impact on social and occupational functioning and therefore on quality of life. It is very important to recognize early psychotic symptoms and to prevent catastrophic consequences such as suicide in MS patients, not only to save ones life but also because it could affect patients' compliance in the treatment of their main disease - Multiple sclerosis.

### 36. AUTOIMMUNE ENCEPHALITIS: A CASE REPORT

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**Introduction/Objectives:** Autoimmune encephalitis is an inflammatory disorder of the brain that may be associated with neuronal antibodies against neuronal cell surface or synaptic proteins. The most common receptors are the N-methyl-aspartate receptor (NMDAR), alfa-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid receptor (AMPA), gama-aminobutric acid-B receptor (GABABR), leucine-rich glioma inactivated protein 1 (LGI1), contactin-associated protein-like 2 (CASPR2), metabotropic glutamate receptor 5 (mGluR5), dipeptidyl-peptidase-like protein-6 (DPPX), gama-aminobutyric acid –A receptor (GABAAR), glutamic acid decarboxylase (GAD65).

GAD65 and GABAAR are associated with a severe form of encephalitis with refractory epilepsy and status epilepticus.

**Case report:** A 30-year-old female patient, previously healthy, presented with a generalised tonic-clonic seizure and she was admitted to the intensive care unit. After the seizure her consciousness was still impaired to the level of sopor, she was confused, restless and had occasional eye movements. She reacted with withdrawal and grimacing to painful stimulus. Deep tendon reflexes were normal. Her mental status was significantly impaired (nonverbal, not

following commands) the second day after the admission. Nine days before the illness she gave birth to a healthy baby. She was treated with acyclovir, methylprednisolone and intravenous immune globulin for five days. Nonconvulsive status epilepticus lasted for 24 hours and stopped after intravenous administration of levetiracetam. Intravenous immune globulin treatment was repeated after two months. Routine haematological and biochemical analysis were unremarkable. CT and MRI of brain with contrast were normal. EEG showed continuous rhythmic delta waves 2-3 Hz and periodical rhythmic spike-wave activity over left frontotemporal region and periodical epileptiform discharges. These changes periodically occurred over right frontotemporoparietal region. Cerebrospinal fluid analysis showed mild pleocytosis (mononuclear cells 24/mm<sup>3</sup>, polymorphonuclear cells 5/mm<sup>3</sup>) and normal protein and glucose levels. Serum and cerebrospinal fluid serological tests for Chlamydia pneumoniae, Mycoplasma pneumoniae, Borrelia burgdorferi and neurotropic viruses were negative. Anti-GAD antineuronal antibodies in serum were positive (97,6 IU/mL). NMDA, VGKC, AMPA, tumor markers and syphilis test were negative.

**Conclusions:** We reported a case of autoimmune encephalitis associated with GAD antibodies and a severe form of encephalitis and refractory non convulsive status epilepticus. The patient was fully recovered after the treatment with levetiracetam, oxcarbazepine and intravenous immune globulin. She had no more epileptic seizures and no neurological impairment.

### 37. IS CAROTID STIFFNESS A POSSIBLE SURROGATE FOR STROKE IN LONG-TERM SURVIVORS AFTER NECK RADIOTHERAPY?

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**Introduction/Objectives:** The risk for cerebrovascular late effects among childhood cancer survivors is considerable. According to recent studies it is not clear which marker could be reliable for the screening of cerebrovascular diseases among the long-term survivors of childhood cancer. The purpose of this study is to analyse arterial stiffness and intima media thickness as possible early markers of later occurring stroke

**Participants, Materials/Methods:** Twenty-three patients, treated for HD in childhood, were included. They had received radiation therapy to the neck with 20- 65 (med.30) Gy. Twenty-six healthy controls, matched in age, sex, BMI, arterial hypertension, smoking history and total cholesterol levels were compared. High-resolution colour-coded duplex sonography and power Doppler sonography of the carotid

arteries were performed and intima –media thickness, number and quality of plaques were measured. Arterial stiffness indices were calculated.

**Results:** Plaque deposits and/or arterial wall calcinations were found in 24 out of 43 (55.8 %) vessels in cancer survivors group and 0 out of 52 vessels in the group of healthy controls ( $p < 0.01$ ). We found significant group differences for all the stiffness parameters we used ( $P < 0.05$ ), but there was no difference in intima–media thickness between cases and controls ( $p = 0.92$ ). In a multivariate model, carotid pulse wave velocity was positively associated with smoking.

**Conclusions:** The arterial stiffness has appeared as a possible surrogate marker for stroke in long-term survivors of childhood cancer. Smoking habit might have an additional negative influence on vascular aging in the group of patients after neck radiotherapy.

coming to Istria mostly from Germany (31,4%), Italy (19,3%), Slovenia (15,3%) and Austria (15,3%).

**Conclusion:** Stroke is still important and serious health risk among tourists especially during the hot summer seasons. Stroke is registered mostly among tourists in ages over 65 but we are registering even more and more often patients who were younger than 50 years of age. Lifestyle changes, changes of climate and of activities during holidays, changes of food and drinks can be of greater influence to health risks especially to elder people and can cause sudden stroke incidence.

### 38. OCCURRENCE OF STROKE AMONG FOREIGN TOURISTS IN COUNTY OF ISTRIA DURING THE PERIOD 2014 - 2017 AS RECORDED IN INTERVENTIONS OF INSTITUTE OF EMERGENCY MEDICINE OF COUNTY OF ISTRIA

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**Introduction/Objectives:** was to report occurrence of stroke (I 64) among foreign tourists during their stay in County of Istria in the period 2014 – 2017.

**Methods:** the retrograde statistic analyses of morbidity of stroke were performed taking in account data related to gender and age groups as those data were registered in the annual reports of Institute of Emergency Medicine of County of Istria and Institute of Public Health of County of Istria, Pula.

**Results:** during the observed period 2014 - 2017, in Istria, a total of 124 foreign tourists suffering of stroke were examined in the field by the teams of Institute of Emergency Medicine of County of Istria. There were 85 males and 39 females, or 7,8% out of the group of cerebrovascular diseases. The stroke was registered twice more often among foreign males during the summer seasons. During the year 2014 we had registered the highest number of interventions (13,36%) due to stroke among 25 males. During the year 2017 we had registered 6,3% of females with stroke. The occurrence of stroke was in the same range among patients of both genders in the ages 65 and older. Patients were

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