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THE JOURNAL OF THE CROATIAN MEDICAL ASSOCIATION
Utemeljen 1877. Founded 1877

CROATIAN STUDENT SUMMIT

BOOK OF ABSTRACTS

NEUROSCIENCE

C16 CROSS

DECEMBER 9 – 12, 2020

16th International Biomedical
Croatian Student Summit
University of Zagreb **School of Medicine**

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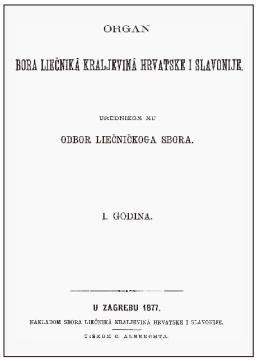
ORGAN
BORA LIEČNIKÁ KRALJEVINÁ HRVATSKE I SLAVONIJE.
ODBOR LIEČNIČKOGA SBORA.
I. GODINA.
U ZAGREBU 1877.

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Description

The Croatian Medical Association started publishing its professional journal *Liječnički Vjesnik* in 1877. *Liječnički Vjesnik* is one of only about a hundred international journals that were coming out in the late 19th century, maintained continuity during the 20th century, and then entered the 21st century. It is also the oldest Croatian medical journal and regularly captures all important achievements, professional and trade events. Editorials, professional and scientific papers, review articles, patient reviews, medications and methods, preliminary scientific and expert papers, reviews, letters to the editor, book reviews, literature papers and other contributions are published in the journal *Liječnički Vjesnik*. Through publishing original scientific and professional papers by local authors, *Liječnički Vjesnik* has contributed to the overall health care improvement. All manuscripts are subjected to a review process. All articles should be addressed to the Croatian Medical Association, Office of Liječnički Vjesnik, Zagreb, Šubićeva 9, tel. (01) 46-93-300, e-mail: lijecnicki-vjesnik@hlz.hr.

MEMBERSHIP AND SUBSCRIPTION: Membership, subscription or any other cash dispatches should be sent to the Croatian Medical Association, Zagreb, Šubićeva 9, Croatia. Bank account: HR7423600001101214818, VAT number HR60192951611. The membership fee for the Croatian Medical Association is 200,00 HRK. The membership fee for the family member is 100,00 HRK. Subscription fee for *Liječnički vjesnik* is 315,00 HRK (84 euros). Members and other legal entities are advised to inform Croatian Medical Association – Editorial Board of Liječnički Vjesnik about any change of address in order to receive the journal regularly. Each member of the Croatian Medical Association is allowed to publish the article in the journal *Liječnički vjesnik* for free. Non-members are also allowed to publish the article with administration fee in amount of 187,50 HRK + VAT.

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BOOK OF ABSTRACTS

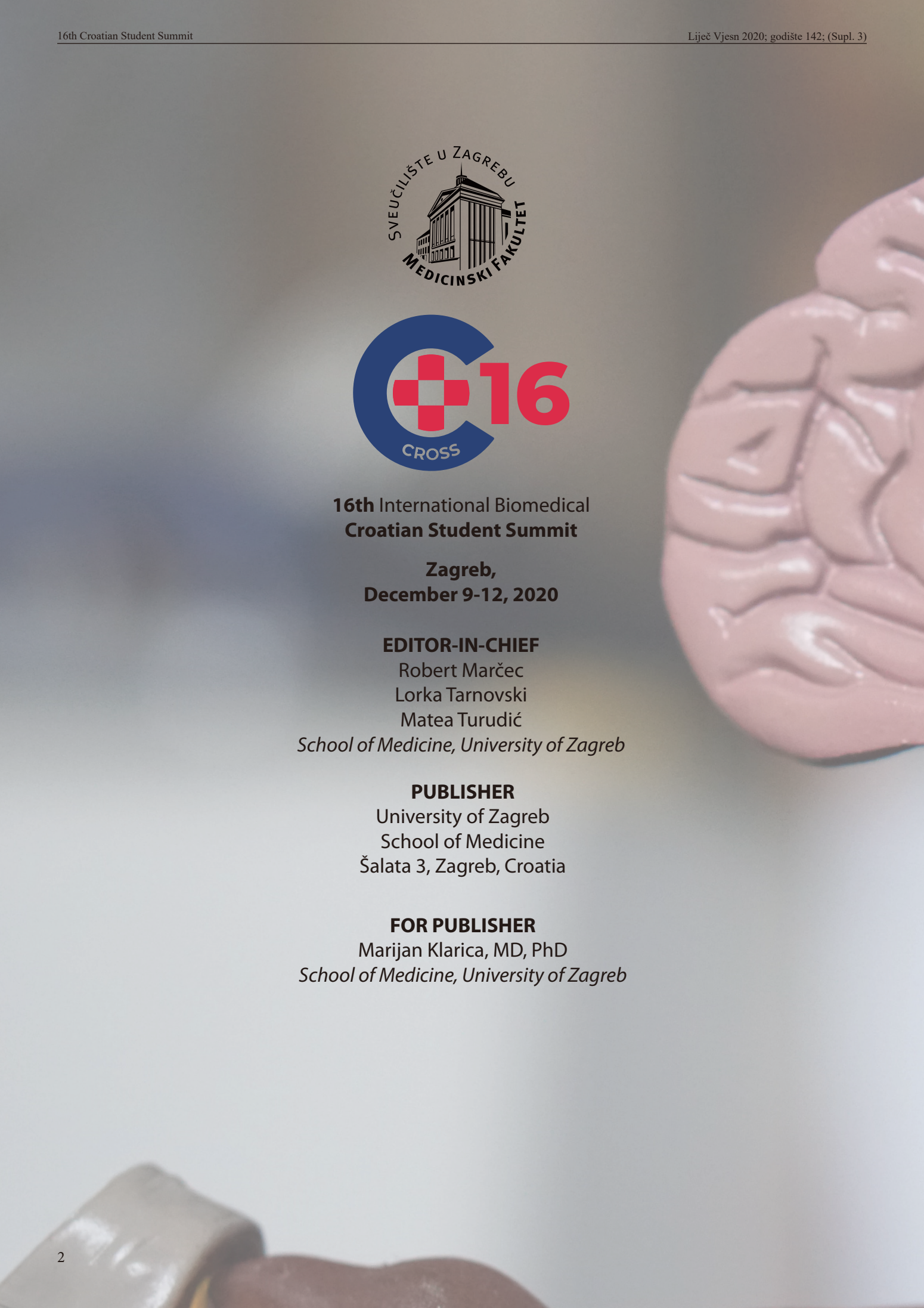
NEUROSCIENCE

DECEMBER 9 – 12, 2020

Croatian Student Summit 16

University of Zagreb School of Medicine

CROSS C 16



16th International Biomedical
Croatian Student Summit

Zagreb,
December 9-12, 2020

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NEUROSCIENCE

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ORGANISED BY

University of Zagreb School of Medicine

"Andrija Štampar" School of Public Health

Student Council of School of Medicine, University of Zagreb

General Information

VENUES

University of Zagreb, School of Medicine, Šalata 3

Croatian Institute for Brain Research (CIBR), Šalata 12

"Andrija Štampar" School of Public Health, Rockefeller Street 4

REGISTRATION DESK

Registration desk will be open for speakers only, every day of the Summit, 1 hour before the scheduled lectures for that day.

SOCIAL MEDIA

You are invited to follow CROSS 16 on the social media for updates and news, to share experiences and practices, or to simply ask for opinions.
Don't forget to use the hashtag #CROSS16 to share your experience at CROSS 16!

LIABILITY AND INSURANCE

The Summit Organising Committee and School of Medicine cannot accept liability for personal accidents or loss of or damage to private property of participants. Participants are advised to take out their own personal travel and health insurance for their trip.

CERTIFICATE OF ATTENDANCE

Certificates of attendance will be distributed via e-mail. You will get your Certificate on the e-mail address you entered while purchasing the tickets; it may take up to 15 days after the conclusion of the Summit for you to get your Certificate.

PUBLIC TRANSPORTATION

The main building of the School of Medicine is located very near the city centre and as such is easily accessible by public transportation. Several tram lines make a stop at Draškovićeva (4, 8, 11, 12, 14), which is the closest stop from the main building. The School of Public Health "Andrija Štampar" can also be reached by tram lines that make a stop at Gupčeva Zvijezda (8, 14), even though a more practical way to reach it may be a ten-minute walk from the main building of the School of Medicine.

More information on our local public transportation network can be found at: http://www.zet.hr/en.

POSTER ORAL PRESENTATIONS

Posters specifically chosen by the Scientific Programme Committee will be discussed during the Poster Sessions. These posters do not require printing or production of materials – as your work will be presented electronically. Posters will be available at the Poster stations at the Summit, on the CROSS 16 website during the Summit and in an online archive for one year following the Summit. Viewers will be able to easily find and browse and download the posters in PDF format when permitted by the presenter.

This year the poster presentations will be recorded by the presenters. Each poster presentation should be about 5 minutes long. During the Summit the Scientific Programme Committee will ask questions following the evaluation of your presentation.

*All posters will appear on plasma stations in the Poster Area and are available for electronic viewing at all times for participants.

SOCIAL PROGRAMME EVENTS

Unfortunately, because of the restrictions put in place by the Civil Protection Headquarters, we are forced to cancel every social programme event during this iteration of CROSS.

Rules for Submission

GENERAL RULES

All abstracts and ePosters must be submitted in English.

The CROSS Scientific Committee will review all abstracts. Following the information regarding acceptance, scheduling information will be sent to the abstract submitter.

The Congress Book of Abstracts will include plenary lectures, satellite symposium abstracts, workshop abstracts and all accepted poster presentations.

All abstracts must be submitted and presented in clear English with accurate grammar and spelling of quality suitable for publication. If you need help, please arrange for the review of your abstract by a colleague who is a native English speaker, by a university specific publications office (or a similar facility) or by a copy editor, prior to submission.

Abstracts must be original and must not be or have been published or presented at any other meeting prior to the Congress. Abstracts containing updated information or modified data to previously published or presented abstracts will not be considered or accepted for presentation.

Please note that each person may submit up to 3 abstracts as a presenting author.

Upon submission, the Abstract Submitter confirms that the abstract has been previewed and that all information is correct, accepts that the content of this abstract cannot be modified or corrected after final submission and is aware that it will be published exactly as submitted.
Submission of the abstract constitutes the authors‘ consent to publication (e.g. Congress Abstract Book, CROSS website, Programmes, other promotion, etc.).

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WELCOME TO CROSS 16!

DECEMBER 9 – 12, 2020

Croatian Student Summit 16

University of Zagreb School of Medicine

CROSS 16

Welcome to Zagreb...

Zagreb, the capital and the largest city of Croatia, ranks among the oldest cities in Central Europe but it is also a modern metropolis situated in the northwestern part of the country along the river Sava and beneath the Medvednica mountain. Due to its developed industries, scientific and research institutions and transport connections, Zagreb is also the cultural, scientific and economic centre of the country.

Although the history of Zagreb goes back to the Roman time, the first written reference to Zagreb dates to 1094 when it was divided into two parts: Kaptol with the Zagreb Cathedral and the larger part Gradec. Two parts were united in 1851 by the count (in Croatian "ban") Josip Jelačić, whose statue today proudly stands on Zagreb's main square, named after the „ban" himself.

There are many legends about Zagreb however, the most famous one is how Zagreb got its name. A thirsty knight saw a well as he was passing through this area and a local maiden named Manda was standing next to it. He pleaded: "MANDO, DUŠO, ZAGRABI!" ("Manda, sweetheart, scoop some water!") Today, a small circular fountain called Manduševac is located at Zagreb's main square, built above a natural spring that provided Zagreb with drinking water until the end of the 19th century.

Zagreb attracts visitors with the lively atmosphere of its streets, numerous coffee shops, restaurants and shopping. For a modern capital, Zagreb has a kind of small-town charm, with an amazing hilltop district of cobblestone streets and squares lit to this day by gas lamps. Prestigious fountains, beautiful park-woods and parks make it also one of the greenest cities in Europe. One of the most remarkable buildings in the city is Zagreb Cathedral in Gothic style, St. Mark's Church from the 13th century with admirably colourful tiled roof and Croatian National Theatre, neo-baroque Zagreb masterpiece.

With approximately 20 theatres, 30 museums, 58 galleries and art collections (mostly located in the very centre of the city), a great zoo and almost a million inhabitants, Zagreb offers various possibilities to guests of all profiles. The best ways to explore Zagreb are walking through historical streets and observing its hidden beauties, or by using its blue trams, „the blood vessels" of the city, which pulsate day and night making Zagreb a truly vibrant city. Whether you need some live music at a bar or a good sit-down meal, Tkalčićeva street (or just „Tkalča" as Croatians call it), should be your first port of call. There is something for everyone - from underground clubs and cafes to creperie, burger bars and high-end restaurants.

Notable Zagreb souvenirs are the tie or cravat, an accessory named after Croats who wore characteristic scarves around their necks in the Thirty Years' War in the 17th century and licitars, honey dough cookies painted with red enamel and decorated with patterns and messages.

Zagreb is also known for its Christmas market which was several times elected as the best in Europe. Streets and squares lit up and offer a unique range of tidbits at their Christmas fair. However, the fun continues through the whole year as festivals of all kinds roll in week after week: coffee and chocolate, street food, art performances, music etc.

...and our School of Medicine!

School of Medicine at the University of Zagreb was established in 1917. Just 3 years ago, we celebrated our 100th anniversary, which makes our School of Medicine the oldest one in the western Balkan region of Europe. It was founded around the time the Austro-Hungarian empire began falling apart, giving rise an autonomous State of Slovens, Croats and Serbs. This independence enabled Croats to expand the University of Zagreb. That is when Milan Rojc proposed the establishment of a medical school to the Croatian parliament. As a result of his efforts and that of many others who came after, Zagreb School of Medicine gave rise to many great doctors. One of the most well-known among them was Andrija Štampar, an especially notable mention in times of the coronavirus pandemic since he established the Public Health service in former Yugoslavia and later created the foundations of the public health system in Croatia. He subsequently went on to head the first Health Assembly in Geneva and wrote the constitution for WHO in 1948. In this brief text, however, examples of the modern life of a medical student at our School are provided with an overview of various extracurricular activities our students engage in.

Besides the classic overwhelming workload characteristic of any medical school our students are able to take part in numerous student organisations as well as having ample research oportunities. Such extracurricular activities enable students to focus on and further explore their fields of interest early on in their medical career. There are 16 student organisations covering numerous medical fields. There are also 2 student magazines active on our campus, Medicinar and Gyrus, and both are run and published by students. Gyrus mostly covers subjects related to the field of neuroscience while Medicinar covers a wide range of topics related to both student life and new interesting research in the Medical field. Both magazines provide students with an opportunity to exercise their writing and publishing skills while providing a great platform for young researchers to publish their work.

Practical work experience is crucial for any young doctor, which is why our student organisations offer various workshops and volunteer work opportunities in hospitals. For example, the Student organisation for Surgery organises courses where students can learn basic stitching techniques. The Student organisation for Pediatrics offers opportunities for students to join and observe the work of paediatricians who are on call in hospitals. Most student organisations invite lecturers to talk about specific topics of interest that students may not have an opportunity to learn about during regular courses in Medical school. Finally, the Student Organisation for Infectology is currently collaborating with hospitals in an effort to gather volunteers to help deal with the coronavirus pandemic.

Another notable organisation to mention is the Croatian Medical Students' International Committee, usually referred to as CroMSIC. This organisation offers an impressively wide variety of activities for students to participate in. One particularly interesting project is the international exchange program which provides opportunities for work and education abroad, while also hosting foreign students who visit Zagreb. Lastly, one praiseworthy initiative that has been receiving an increased nationwide recognition is the mRAK project. mRAK works on promoting awareness about HPV virus and vaccine by organising educations in high schools along with various events that target the wider public.

All in all, the activities described above serve to depict just some of the exciting opportunities that serve to form new generations of young doctors at the School of Medicine in Zagreb.

Welcome Message

President of the CROSS 16 Organising Committee

Dear colleagues,

It is my pleasure to invite you to the sixteenth Croatian Student Summit called "Neuroscience". The Croatian Student Summit or popularly called CROSS is a summit organized by the Student Council of School of Medicine, University of Zagreb and has been continuously organized for sixteen years in a row. I would like to point out that CROSS is organized almost entirely by students during the entire academic year, and as such it presents an exceptional value for our faculty, as well as the University. Students have the opportunity to take part as passive or active participants at the Summit, as well as participating in lectures online, and even have the option of participating in CROSS in the form of an elective subject, which by itself speaks of the value this event has on our faculty.

The main goal of CROSS is to provide a place for exchanging ideas, spreading information, achieving co-operation and long-term acquaintances. CROSS enables students and young scientists to learn the importance of participating in congresses and research to advance their education at the beginning of their careers. Attending CROSS and other congresses imbues students with important tools for their future careers such as an understanding of basic science, an analytical thought process and networking opportunities for their fields of interest.

This year's topic is Neuroscience; mental and neurological diseases in developed countries are massive health concerns, and we expect an increase in living standard will influence an increase in those diseases, in both developed and developing countries alike. Therefore, neuroscience is one of the fastest -growing branches of medicine today. With this Summit we would like to bring the word of neuroscience a bit closer to all interested students and young physicians. Even though this year has been challenging for all of us in many ways, we wanted and managed to organise the Summit which we hope will be of great educational value to all of the participants.

Through the lectures of the greatest experts, interesting and educational workshops and quality scientific works, we would like to present to you the enormous opportunities and possibilities for neuroscience today and in the future. Therefore, I welcome you to the CROSS 16, which will be held from December 9 – 12, 2020, at the School of Medicine, University of Zagreb.

Anton Malbašić
President of the CROSS 16 Organising Committee

Welcome Message

President of the CROSS 16 Scientific Programme Committee

Dear colleagues,

on behalf of the Scientific Programme Committee, I am honored to welcome all participants of the Croatian Student Summit 16 and sincerely thank you for all your efforts made in presenting your innovative findings at this summit. I also extend a warm welcome to those of you who have joined us at CROSS to support your colleagues and to learn from the other presenters

This year's topic is Neuroscience, which is one of the fastest-growing fields in medicine that focuses on mental and neurological diseases, the development of the human brain, and new technologies. The main idea of this year's summit is to create a place where young doctors and scientists can exchange ideas, learn new information, and establish many connections with other colleagues and students that are interested in the field of neuroscience.

As one of the Editors-in-Chief of this book of abstracts, I am very proud to say that we have continued our successful collaboration with Liječnički vjesnik, and want to express my sincere gratitude to The Editorial Board, Editor-in-Chief Prof. Branimir Anić, MD, PhD and the Secretary of the Editorial Office Mrs Draženka Kontek for making this collaboration possible.

I give my gratitude to the members of the Organizing and Scientific Programme committee who have worked hard on planning and organizing this event. I would also wish to extend my appreciation to the keynote speakers who have come all this way to join us and to share their knowledge with us.

I wish you all a successful summit!

Matea Turudić
President of the CROSS 16 Scientific Programme Committee

Welcome Message

President of the Student Council

Dear Participants,

As a president of Student council, University of Zagreb, School of medicine, it is a great privilage to welcome you to our 16th Croatian Student Summit in Zagreb. I am very pleased to say that CROSS has already become a traditional event, widely known in academic community, which provides young students and scientists a perfect opportunity to gain new skills and experiences necessary for their future careers. When we first started with this project in 2005, the main idea was to give students a great chance to present their scientific work and broaden their knowledge in the field of biomedicine. Also, we are very proud that, throughout these 16 years, CROSS gained international recognition with participants from all over the Europe.

It is always a great satisfaction to see so many talented and hardworking students and young scientists, here in one place, University of Zagreb, School of Medicine, gathered around one theme. Also, CROSS is an excellent place to develop important skills for our future profession and to establish many connections with our colleagues, students and professors, from all over the Europe.

I want to take this opportunity and thank the Dean of School of Medicine, University of Zagreb, Marijan Klarica, PhD, PE and Student council, University of Zagreb for their generous support. Without them, our lecture professors and, of course, members of Organization and Scientific committee, this great story wouldn't be possible.

At the end, I would like to emphasize one thing. Although the main focus should be on gaining useful knowledge for your future professional challenges, don't forget to have fun. .

Thank you and best regards.

Marin Boban
President of the Student council,
School of Medicine, University of Zagreb

About This Year's Topic

NEUROSCIENCE

Why do we feel someone is looking at us? What do we think when we are born? Why do we forget something we studied for an entire year in a fraction of a second but remember the lyrics of a song we haven't heard since the first grade?

The art of brain functioning, and also the top-secret our body keeps, is the basic question of neuroscience. The brain, having more than 1 hundred billion neurons and 3 hundred trillion synapses, is the most complex organ of the body. To make it more complicated, it developed plasticity making it possible to alternate itself if under stress.

Way back in history, during ancient Egypt, it was believed that the heart was the "heart" of the intelligence, and the brain being only the stuffing for the cranium. It wasn't until the Greeks that people started to consider the idea of the brain being responsible for one's mental functions.

With the development of the microscope, neuroscience started finding its path. When Santiago Ramon y Cajal used Golgi's method, silver staining technique to visualise neurons, neuron doctrine was founded. It enabled science to get a look at the very functional units of the nervous system and also made Cajal and Golgi the winners of the Nobel Prize for Physiology or Medicine in 1906.

At the proximately same time, the hypothesis of localisation of function was established after Paul Broca observed the specific loss of function after brain damage and John Hughlings Jackson observed his patients with epilepsy who presented with temporary motor disturbances as the seizures progressed. Additionally, Carl Wernicke supported the hypothesis by referring the specific brain structures to speech perception and production.

The rapid development of neuroscience emerged in the 20th century by joining multiple branches of medicine to study brain functions. The theory of action potentials was crucial for the understanding of the nervous system. Hodgkin – Huxley duo got an idea in 1952. to investigate the electrical signal transmission in a giant axon of a squid and formed the term "action potential" making it possible to create models to understand the innervation and functioning of membranes in nervous, but also other tissues.

Neuroscience in Croatia, although not being a field of science for itself, but included in Biomedicine and health studies, is highly recognised in the world. This is mostly due to the Croatian Institute for Brain Research founded in 1990 by the academic Ivica Kostović. Academic Kostović is one of the pioneers of Croatian neuroscience, most known for his discovery of the foetal sublate brain zone in 1974. The Croatian Institute for Brain Research serves to link together basic and clinical neuroscience, from molecular and histological research to structural and functional imaging. The Institute is also famous worldwide for its collection of human brains – the Zagreb Neuroembryological Collection which has specimens covering the whole human development, from the early human embryonic brain to that of an elderly adult.

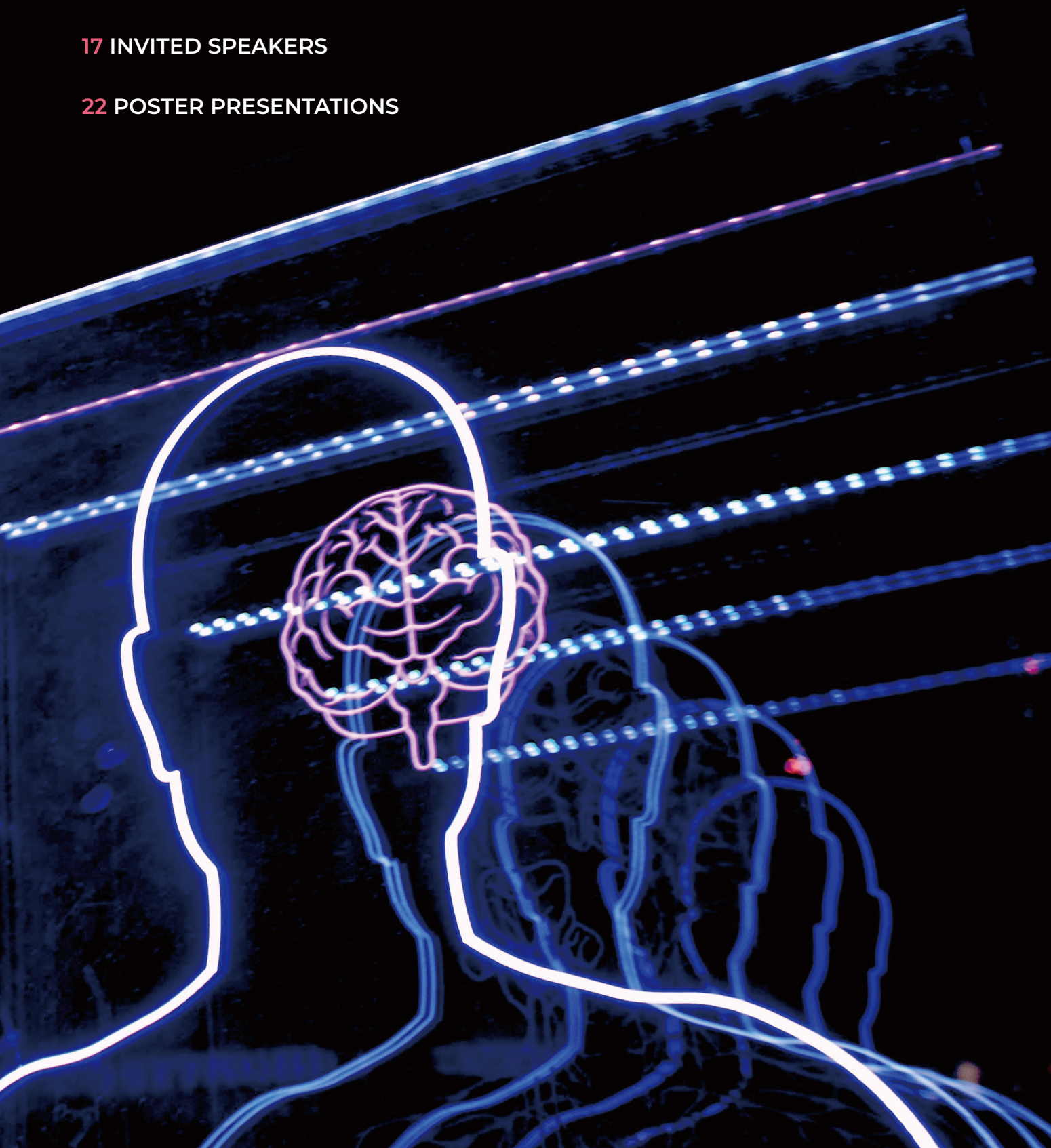
In the last 50 years, 9 Nobel prizes were awarded for the contribution to neuroscience, mostly for physiology but also for chemistry, proving the multidisciplinary approach as an imperative to make any progress in this field.

It is our honour to present you what's new in neuroscience, our recognised neuroscientists and those who plan to be ones. Who knows, maybe in the next 50 years one of this year's CROSS participants will be the new notable name in the development of neuroscience.

Sincerely,

CROSS 16 Organisers

SCIENTIFIC PROGRAMME



Wednesday
December 9th

School of Medicine, Šalata 3

15:00 - 16:00

Registration for invited speakers
Registration Desk in front of Čačković Hall

16:00 - 18:00

Opening Ceremony and Introductory Plenary Session
Čačković Hall

Welcome Messages

Vice-rector for Science, Inter-Institutional Cooperation and International Relations

Dean of School of Medicine

President of the Student Council

President of CROSS 16 Organising Committee

New developments in the understanding of the CSF hydrodynamics
MIROSLAV VUKIĆ, MD, PhD

Autonomic nervous system – From theory to practice
MARIO HABEK, MD, PhD

Thursday
December 10th

9:00 - 11:00

Poster Session 1

11:30 - 13:00

Poster Session 2

13:00 - 14:00

Registration for invited speakers
Registration Desk in front of Čačković Hall

14:00 - 16:00

Plenary Session 1
Čačković Hall

I Just Don't See You Like That: Atypicalities in visual face perception
MIRTA STANTIĆ, B.Sc

White matter interstitial neurons: past, present and future
GORAN SEDMAK, MD, PhD

Neural coding of behaviour in the rodent associative cortices
BARTUL MIMICA, MSc, PhD

16:00 - 19:00

Workshop Session 1

AGENDA

Friday
December 11th

11:00 - 13:00

Poster Session 3

13:00 - 14:00

Registration for invited speakers
Registration Desk in front of Čačković Hall

14:00 - 16:00

Plenary Session 2
Čačković Hall

Psychoses – concepts and biology underlying these phenomena
ALEKSANDAR SAVIĆ, MD, PhD

Clinical neuroscience of music
MARIJA PRANJIĆ, MA

Experimental models of neurodegeneration: the STZ story
JAN HOMOLAK, MD

16:00 - 19:00

Workshop Session 2

Saturday
December 12th

9:00 - 11:00

Poster Session 4

11:30 - 13:00

Poster Session 5

13:00 - 14:00

Registration for invited speakers
Registration Desk in front of Čačković Hall

14:00 - 16:00

Plenary Session 3
Čačković Hall

Deep brain stimulation – past, present, future
DARKO CHUDY, MD, PhD

Robots and brains: robotics in neurosurgery
LUKA DROBILO, MSc

The making of the human brain: lessons learned from technology
LANA VASUNG, MD, PhD

16:00 - 16:30

Closing Ceremony

Invited Speakers

Darko Chudy, M.D., PhD

School of Medicine, University of Zagreb
Clinical hospital "Dubrava"

Darko Chudy was born in 1962 in Zagreb, Croatia. He specialised in neurosurgery and he is the Head of the Department of Neurosurgery in Clinical Hospital Dubrava. He obtained his master's degree in Biomedicine at the Faculty of Science, the University of Zagreb in 1996 and Ph.D. in 2000. At the University Hospital Centre Zagreb, he started performing stereotactic surgeries and he introduced deep brain stimulation technique to neurosurgery in Croatia in patients with movement disorders (e.g. Mb Parkinson, dystonias, essential tremor) and incurable pain syndromes. He obtained the patent for the original noninvasive stereo adapter used in neurosurgical procedures. Currently, he is an Affiliate Associated Professor at the Department of neurological surgery Univerity of Washington Seattle USA since 2010 and Associate Professor of Neurosurgery at Medical School Zagreb since 2013.

He was one of the managers of the „RONNA“ project with a clinical trial for including the robotic system in neurosurgery and „NERO – neurosurgical robot“ project. He is the co-founder of the Reference Center for Functional and stereotactic neurosurgery, Clinical Hospital Dubrava. He received the Pride of Croatia award for successful treatment of patients in a minimal state of consciousness in 2011, an award „Zeleni karton” in 2012, award for accomplishments in the development and use of robotics in neurosurgery in 2018 and many more.

Luka Drobilo, M.Sc.

Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb
Clinical hospital "Dubrava", Zagreb

Luka Drobilo is a research associate at the Clinical hospital Dubrava in Zagreb, working as part of a multidisciplinary robotics research group at the Faculty of Mechanical Engineering and Naval Architecture of the Zagreb University. He received his master's degree in Mechanical Engineering at the Faculty of Mechanical Engineering and Naval Architecture, where he is currently also attending PhD studies. The research group is focused on developing advanced solutions in the field of neurosurgical robotics and robotics in general.

Current work includes research and development focused on NERO and RONNA neurosurgical robotic systems, focusing primarily on increasing the accuracy of the robots and neurosurgical procedures, as well as designing new tools and precise measurement and calibration setups.

Associate Professor Mario Habek, M.D., PhD

Department of Neurology, Clinical Hospital Centre "Zagreb"
School of Medicine, University of Zagreb

Mario Habek graduated from the Medical School in Zagreb in the 2003. After graduation, he became a research assistant in the Department of Neurology, School of Medicine in Zagreb, and a year later he got a residency in neurology which he finished in 2009. He defended his PhD thesis in 2010. on the subject of multiple sclerosis. For the purpose of further education, he stayed at Massachusetts General Hospital, Harvard Medical School in Boston, USA and Tel-Aviv Sourasky Medical Center, Tel-Aviv, Israel. So far he has published over 160 scientific papers, actively participated in numerous international conferences, and in the 2011. he was awarded by the School of Medicine for outstanding scientific productivity in the project period 2007-2011. From 2014-2017 he led a project Brainstem Evoked Potentials Score and Composite Autonomic Scoring Scale as a Predictors of Disease Progression in Clinically Isolated Syndrome founded by Croatian scientific foundation (UIP-11-2013-2622). The area of his research activities are multiple sclerosis, clinical neurophysiology, autonomic nervous system disorders and dizziness. Since 2019, he holds the position of Associate Professor of Neurology.

Jan Homolak, M.D., PhD candidate

Department of Pharmacology, School of Medicine, University of Zagreb

Jan Homolak is a PhD student and assistant in the Laboratory for molecular neuropharmacology at the Department of Pharmacology, University of Zagreb School of Medicine. Jan graduated from University of Zagreb School of Medicine.

Bartul Mimica, mag. psych., PhD

Kavli Institute for Systems Neuroscience, Norway

Bartul Mimica completed a psychology degree at the University of Zagreb before taking up a PhD position at the Kavli Institute for Systems Neuroscience in Norway. In his graduate work, he used a combination of electrophysiological, optogenetic and computational methods to study how rat associative cortices encode naturalistic behaviors. A part of this project was published in *Science* magazine in November 2018, and Bartul defended his thesis in December 2019.

Marija Pranjić, MA, MMus, NMT, Phd candidate

Music and Health Science Research Collaboratory, University of Toronto

Marija Pranjić is a PhD student in Music and Health Sciences, spec. Neuroscience, at University of Toronto. Marija holds an MA in Music Therapy from Cambridge Institute for Music Therapy Research and a magna cum laude MMus in Piano Performance from Academy of Music in Zagreb. Prior to PhD studies, she worked as a Research Fellow at Mount Sinai Hospital in New York, as part of the Louis Armstrong Center for Music and Medicine. Her clinical experiences include working in pediatric neurorehabilitation, oncology, cognitive and developmental delays, pulmonary rehabilitation, as well as serving the unique health care needs of musicians and performing artists.

Marija's research interests lie in the domain of clinical neuroscience of music with an emphasis on neuroplasticity in auditory-motor networks and biomedical applications of music to neurologic rehabilitation. At CROSS 16, she will deliver a lecture entitled "Clinical Neuroscience of Music: Applications of music in the health sciences", presenting the most current state of knowledge about music as a complex sensory language that engages cognitive, affective, and sensorimotor processes in the brain.

Aleksandar Savić, MD, PhD

Department of Forensic Psychiatry, University Psychiatric Hospital "Vrapče"

Aleksandar Savić is a consultant psychiatrist with subspecialization in forensic psychiatry, working at the Department of Diagnostics and Intensive Care and the Department of Forensic Psychiatry of the University Psychiatric Hospital Vrapče. After completing University of Zagreb School of Medicine, and his psychiatry residency training at the University Psychiatric Hospital Vrapče, he received the Fulbright Fellowship and spent a year at the Yale University's Department of Psychiatry. During his time at Yale as a visiting researcher, he took part in various research elucidating biological underpinnings of psychiatric disorders, and specifically psychosis spectrum disorders, using functional neuroimaging methods, pharmacological intervention models, and computational psychiatry. Upon returning to Zagreb, Dr. Savić continued collaboration with Yale's Division of Neurocognition, Neurocomputation, and Neurogenetics (N3), and completed additional clinical training in forensic psychiatry. His PhD thesis on thalamic connectivity changes in schizophrenia, defended at the University of Zagreb, resulted from this collaboration.

Dr. Savić's areas of interest include psychosis spectrum disorders, first-episode and early-course psychosis, and the clinical high risk for psychosis, with the primary focus on biological aspects of the disruptions underlying those states, but also specific phenomena like language processing disruptions, and the forensic psychiatric aspects.

Assistant Professor Goran Sedmak, M.D., PhD

Croatian Institute for Brain Research
School of Medicine, University of Zagreb

Goran Sedmak was born in 1983. in Zagreb, Republic of Croatia. He obtained his MD degree graduated at the University of Zagreb School of Medicine in 2007., and PhD in Neuroscience in 2013. Currently, he is an Assistant Professor of Neuroscience at the Croatian Institute for Brain Research, University of Zagreb School of Medicine. He serves as a Head of the Division of Developmental Neuroscience, and Deputy Director of the Croatian Institute for Brain Research. In his career he has published 24 scientific papers in leading journals which are cited more than 1.400 times. He is also co-author of two chapters in international books. He was active researcher in 6 domestic and international projects, and currently is principal investigator of one project. His field of interest is development and transcriptomics of the human brain.

Mirta Stantić, B.Sc.

University of Oxford

Mirta Stantić is a cognitive neuroscientist interested in the perception of faces both in the neurotypical population as well as in atypical groups that struggle with this fundamental sociocognitive ability. She is currently a doctoral researcher at the University of Oxford where her research concerns cognitive and neural mechanisms of high-level vision in autism and prosopagnosia. Her work is funded by the DTP ESRC fellowship and a Wilfrid Knapp scholarship, and she has been awarded Erasmus+ and Wellcome Trust Vacation fellowships as a supervisor. Mirta's collaboration with Brad Duchaine or Dartmouth College has been recognized by the Elsevier Vision Research Award, the ESRC Overseas Institutional Visit Grant and the EPS Study Grant.

Prior to her current work, Mirta worked as a data analyst at Facebook in Palo Alto and San Francisco, California. Before that, she graduated summa cum laude from Harvard University with a degree in Cognitive Neuroscience and Evolutionary Psychology. Her research there (funded by the Herchel Smith Science Research Fellowship and David Rockefeller International Research Grant) concerned differences in representational geometries of prosopagnosic patients. She was awarded the Harvard Psychology Research Prize for this work.

Mirta teaches at Oxford and King's College London, where she is responsible for various modules in the field of cognitive neuroscience, mostly focused on individual differences in cognitive mechanisms of vision, perception, and clinical and sub-clinical conditions.

Lana Vasung, M.D., PhD

Harvard Medical School
Fetal-Neonatal Neuroimaging Development Neuroscience Centre, Department of Newborn Medicine, Boston Children's Hospital

Lana Vasung is a physician-scientist. She obtained her MD (2007), as well as her Ph.D. in Neuroscience (2013), from the University of Zagreb, Croatia. After her Ph.D. graduation, she worked as a Clinical Research Candidate for 'Special Programme University Medicine' and young clinicians ('SPUM program') at the Department of Pediatrics and Neuroradiology, University of Geneva, Switzerland (2013-2016). In 2016, after obtaining her Swiss Medical License, the Swiss National Science Foundation (SNSF) awarded her an Advanced Mobility Fellowship (among the top 10 in the national research ranking) to conduct post-doctoral research at Boston Children's Hospital. In 2018 the Ralph Schlaeger Charitable Foundation awarded her fellowship for research in pediatric neuroradiology. From 2020 she holds an academic appointment at Pediatrics, Harvard Medical School, and works as a researcher at the Fetal-Neonatal Neuroimaging Developmental Neuroscience Center and the Department of Newborn Medicine, Boston Children's Hospital.

Associate Professor Miroslav Vukic, M.D., PhD

Department of Neurosurgery, School of Medicine University of Zagreb

Miroslav Vukić was born in 1966 in Karlovac, Croatia. He graduated from Medical School, the University of Zagreb in 1991, obtained his Ph.D. in Biological sciences in 2002 and he completed his neurosurgical residency in 1998 in University Hospital Sisters of Mercy. He attended many courses and training in his field worldwide. Currently, he holds the position of Attending neurosurgeon University Hospital Centre Zagreb and Associate Professor of Neurosurgery at Medical School Zagreb. He is the acting president of the Croatian Neurosurgical Society and Croatian Society for Medical Expertise since 2013, assistant secretary of the World Federation of Neurosurgical Societies since 2019, Board Member- Audit and Governance; European Association of Neurosurgical Societies (EANS) since 2019 and Member of Training Committee of the EANS since 2006. In his career, he published 144 papers that were cited more than 220 times. He is the author of 2 books in the field of medicine and 5 neurosurgical book chapters. He was invited to over 150 talks on various neurosurgical conferences in Croatia and abroad. To this day, he has successfully performed more than 5,885 surgical procedures.

Basic Science

BS01 Development of a new method of aortic valve decellularization using the supercritical extraction technology
Simbarashe Byron Kapomba, Elvira Gafarova

BS02 Apoptotic and corticogenic aspects of brain regeneration after stroke
Kutlić Dominik, Petrović Ante, Srakočić Sanja, Gajović Srećko, Gorup Dunja

BS03 BPC 157 pentadecapeptide reduces oxidative stress levels in renal tissue affected by acute unilateral ischemic renal injury
Helena Žižek, Irma Stilinović, Nora Knez, Slaven Gojković, Vilim Dretar, Tajana Đurašin, Hrvoje Vraneš

BS04 Abdominal venous system hypertension as splenectomy complication leads to intracranial venous sinus hypertension and cerebral edema, pentadecapeptide BPC 157 therapy
Helena Žižek, Vilim Dretar, Irma Stilinovic, Lana Dujmovic, Nora Knez, Lana Sučec, Dora Herceg

BS05 Levels of Neuropeptides among the Gut-brain Axis are Affected by DPPIV/CD26 Deficiency during Colon Inflammation in Mice
Lara Baticic, Edvard Bedoic, Dijana Detel

BS06 Pentadecapeptide BPC 157 counteracts portal and caval hypertension and aortal hypotension in rats with SMVocclusion in relation with no-system involvement
Tajana Đurašin, Lana Dujmović, Dora Herceg, Slaven Gojković, Irma Stilinović, Helena Žižek, Hrvoje Vraneš

BS07 BPC 157 kidney recovery effects in rats with UUO (unilateral ureter obstruction) and hydronephrosis
Hrvoje Vraneš, Nora Knez, Irma Stilinović, Vilim Dretar, Tajana Đurašin, Slaven Gojković, Lana Sučec

BS08 Pentadecapeptide BPC 157 therapy in bile duct ligated (BDL) rats
Lana Dujmović, Lana Sučec, Helena Žižek, Slaven Gojković, Irma Stilinović, Tajana Đurašin, Vilim Dretar

BS09 BPC 157 counteracts intracranial hypertension and severe portal and caval hypertension, aortal hypotension, thrombosis, gastric and duodenal lesions in rats
Slaven Gojkovic, Lana Dujmović, Vilim Dretar, Lana Sučec, Dora Herceg, Nora Knez, Hrvoje Vraneš

BS10 Expression pattern of lncRNA H19 and MALAT1 in the peripheral circulation of patients with calcific aortic valve stenosis - preliminary data
Ivan Matolić Galic, Jesenka Grgurić, Frane Paić

BS11 Pentadecapeptide BPC 157 counteracts portal hypertension, caval hypertension, aortal hypotension, activates bypassing pathway in rats with superior mesenteric artery occlusion
Irma Stilinović, Hrvoje Vraneš, Vilim Dretar, Tajana Đurašin, Helena Žižek, Lana Sučec, Nora Knez

BS12 BPC 157 effect in alcoholized rats counteracts increased ICP, portal and caval hypertension and aortal hypotension, with cloth formation
Slaven Gojkovic, Tajana Đurašin , Vilim Dretar, Lana Sučec, Dora Herceg, Nora Knez, Hrvoje Vraneš

Case Reports

CR01 Dirofilariasis in ophthalmology emergency department
Vesna Galjuf, Karla Ranđelović

CR02 Pigmented epithelioid melanocytoma - borderline melanocytic tumor
Duje Čulina, Tomislav Cigić, Davor Tomas

CR03 Case report: Blastic plasmacytoid dendritic cell neoplasm (BPDCN)
Matea Oroz, Nikolina Musulin, Slobodanka Ostojić Kolonić

CR04 Posttransplant lymphoproliferative disease after liver transplantation
Nikolina Musulin, Matea Oroz, Jelena Popić MD PhD

CR05 Polycystic liver-kidney disease and brain aneurysms: how should we handle the issue?
Robert Ledenko, Goran Kurdija, Magdalena Kujundžić, Iva Bušić, Jelena Popić, Anna Mrzljak

CR06 Aplastic crisis induced by human parvovirus B19 as an initial presentation of hereditary spherocytosis in a child– a case report
Petra Ivančić, Maja Vrdoljak

CR07 Hepatic epithelioid hemangioendothelioma and liver transplantation
Lucija Mihaljević, Dora Meštrović, Ante Meić-Sidić, Mislav Mokos, Anica Milinković, Anita Škrtić, Anna Mrzljak

CR08 Infection of sellar region imitating pituitary macroadenoma – a case report
Inga Starovečki, Antea Sebešić, Tina Dušek

CR09 Segmental pulmonary embolism
Tin Karakaš, Maša Kopušar, Maša Sorić

CR10 A Case of Compensated Extremely Severe Chronic Anemia in a Patient with Hereditary Hemorrhagic Teleangiectasia
Grgur Salai, Dražen Pulanić

CR11 Chelation therapy related proteinuria in Wilson's disease: How should we handle the issue?
Mislav Mokos, Anica Milinković, Lucija Mihaljević, Dora Meštrović, Mario Ilić, Anna Mrzljak

CR12 Recurrent hepatic encephalopathy in a young girl with fulminant autoimmune hepatitis type 2
Boris Kos, Mirna Aničić, Petra Sulić

CR13 Successful treatment of a patient with chronic myeloid leukemia and a V379A mutation using nilotinib
Ana Miličević, Slobodanka Ostojić Kolonić, Inga Mandac Rogulj

CR14 Tonsillar carcinoma after renal transplantation – the impact of immunosuppression
Rafaela Novak, Željka Jureković, Luka Vučemilo, Darija Mužinić, Jelena Popić, Anna Mrzljak

CR15 Drug-induced liver injury in chronic liver disease
Goran Kurdija, Iva Bušić, Robert Ledenko, Magdalena Kujundžić, Anna Mrzljak

CR16 Vasculitis with kidney infarction as a presentation of SLE
Anđela Krstulović Opara, Anamarija Prišćan, Daniela Marasović-Krstulović

CR17 Refractory postoperative hypocalcemia as the only sign of Celiac disease in an adult woman
Antea Sebešić, Inga Starovečki, Zrinka Sertić, Tina Dušek

CR18 Hereditary hemorrhagic telangiectasia – more than a vascular disease
Magdalena Kujundžić, Robert Ledenko, Iva Bušić, Goran Kurdija, Jelena Popić, Anna Mrzljak

CR19 Hydrocephalus caused by choroid plexus papilloma in a pediatric patient with genetic malformation
Lucia Mrđen, Marija Matašin, Toni Matić

CR20 Posterior reversible encephalopathy syndrome in pediatric patient during induction treatment of acute lymphoblastic leukemia
Marija Matašin, Lucia Mrđen, Toni Matić

CR21 Severe anaphylactoid reaction with hypovolemic shock and misoprostol
Tvrtko Tupek, Analena Gregorić, Dubravko Habek

CR22 A child with rare tubulinopathy – How to adequately assess and when to start more advanced treatment of oropharyngeal dysfunction?
Laura Dražić, Mario Ćuk

CR23 Macrovascular coagulation with profuse gastrointestinal bleeding
Iva Miličić, Luka Miličević, Bojana Radulović, Ivan Gornik

CR24 Granulocytic sarcoma – a rare case of extramedullary acute myeloid leukemia
Tomislav Piršljin, Josip Batinić, Nadira Duraković

CR25 Do we need broad differential diagnosis workup in patients with CIS? - A CASE REPORT
Iva Markulin, Filip Mandurić, Tereza Gabelić

CR26 Effectiveness of immunomodulation therapy in multiple sclerosis patient with high MRI burden - A CASE REPORT
Filip Mandurić, Iva Markulin, Tereza Gabelić

CR27 Role of biomarkers in establishing a diagnosis of multiple sclerosis - A CASE REPORT
Filip Mandurić, Iva Markulin, Tereza Gabelić

CR28 Predicting long-term disability in multiple sclerosis patients - A CASE REPORT
Iva Markulin, Filip Mandurić, Tereza Gabelić

CR29 Diagnosis and treatment of adrenergic crisis due to pheocromocytoma
Lea Tomašić, Ivana Kokan, Miro Bakula

CR30 Raw food diet causing heavy metal (As, Hg) intoxication: a case report
Lorena Karla Rudez, Tin Sklebar, Robert Likic

CR31 Beckwith–Wiedemann syndrome – Case report
Mislav Sekulić, Ruža Grizelj

CR32 Chronic Spontaneous Urticaria Accompanied by Angioedema in a Patient with Autoimmune Thyroid Disease Resolved After Thyroidectomy
Ana Gašić, Ivana Karla Franić, Andro Košec

CR33 Interstitial lung disease in patient with rheumatoid arthritis: case report
Gabrijela Buljan, Nikolina Kuštra, Ana Gudelj Gračanin

CR34 Long term management of complex patient with common variable immunodeficiency – a case report
Thomas Ferenc, Mateja Vujica, Miroslav Mayer

CR35 Atypical Clinical Manifestation of Common Variable Immunodeficiency: case report
Matea Liskij, Nikolina Kuštra, Gabrijela Buljan, Ana Gudelj Gračanin

CR36 Treatment of giant cell arteritis: a case report
Nikolina Kuštra, Robert Ledenko,Majda Golob˙, Gabrijela Buljan, Matea Liskij, Nino Tičinović, Ana Gudelj Gračanin

CR37 Occurence of Parkinsonism in Morgagni-Stewart-Morel Syndrome
Kamelija Horvatović, Srdjana Telarović

CR38 Hemicrania continua
Nika Barbara Pravica, Darija Mahović Lakušić

CR39 Recurrent abdominal pain and vomiting caused by a chronic midgut volvulus
Vana Vukić, Mirna Aničić

CR40 Finger swelling and low back pain as a sign of inflammatory disease requiring biological therapy
Matija Matošević, Vana Vukić, Lovro Lamot

CR41 Eltrombopag for the treatment of immune thrombocytopenia secondary to common variable immunodeficiency – a case report
Ema Šćulac, Mirela Veršić, Ana Boban

CR42 Metastatic progression of breast cancer with primary endocrine resistance followed by an atypical rise in Ca 125 tumor marker
Ana Magdalena Glas, Katarina Čular, Natalija Dedić Plavetić

CR43 Extracranial - intracranial bypass surgery in a patient with recurrent transient ischemic attacks
Anamaria Dukić, Ivana Karla Franić, Katarina Čular, Branko Malojčić

CR44 Metastatic recurrence of breast cancer after pregnancy in a 41-year old woman with prematurely terminated adjuvant endocrine therapy
Katarina Čular, Ana Magdalena Glas, Anamaria Dukić, Natalija Dedić Plavetić

CR45 Rituximab-associated progressive multifocal leukoencephalopathy with negative JC virus PCR from the CSF following treatment of follicular non-Hodgkin's lymphoma
Josip Stojić, Ozren Jakšić, Marko Lucijanić, Vlatko Pejša

CR46 Comorbidity of Wilson's Disease mutation (H1069Q) with PAI-1 mutation in non-identical twins
Borna Pribanić, Srđana Telarović

CR47 Primary eosinophilic central nervous system vasculitis: case report
Ivona Ćudina, Lester Toni Dobrić, Marijana Radić, Fran Borovečki

CR48 Extracorporeal membrane oxygenation (ECMO) in a patient who suffered cardiac arrest due to myocardial infarction: Case report
Ines Blažeković, Filip Doder, Teodora Zaninović Jurjević, Davorka Lulić

CR49 A rare cause of oxalate nephropathy: a case report
Antonia Bukovac

CR50 Refractory irritable bowel syndrome and depression – severe disturbance of gut-brain axis
Stjepan Frkanec, Boris Kos, Silvija Cukovic Cavka, Ivana Knezevic Stromar

CR51 Methoxyflurane in acute pain management
Lucija Stojčić, Fran Rašić, Branko Bakula, Iva Bušić, Stjepan Bulat, Borna Diković

CR52 Bickerstaff brainstem encephalitis: A case report
Višnja Stupin, Marija Santini

CR53 Systemic juvenile idiopathic arthritis without arthritis as the cause of intermittent persistent fever in a 7-year old girl
Ana Smajo, Vana Vukić, Lovro Lamot

CR54 Faecal calprotectin as a non-invasive biomarker of gut inflammation in a girl with arthritis
Ana Smajo, Vana Vukić, Lovro Lamot

CR55 Idiopathic retroperitoneal fibrosis diagnosed on MSCT scan
Ana Abičić

CR56 A girl with Turner syndrome and multiple autoimmune disorders
Antonia Precali, Anita Špehar Uroić, Vinka Potočki, Ivan Raguž

CR57 Sporadic pheochromocytoma in young adult presenting with adrenergic crisis
Filip Bosnić, Laura Karla Božić, Ines Bosnić

CR58 Concomitant occurrence of acquired hemophilia and severe form of bullous pemphigoid - a case report
Sara Stalman, Sabina Srbljinović, Ana Boban

CR59 Neurosyphilis
Laura Karla Božić, Filip Bosnić, Ines Bosnić

CR60 Comprehensive eye evaluation in myopia is needed to prevent insidious visual loss
Iva Bušić, Stjepan Bulat, Fran Rašić, Benedict Rak, Mirjana Bjeloš

CR61 Minimally invasive lateral unicompartmental knee replacement: Case report of a patient treated with the Oxford fixed lateral prosthesis
Stjepan Bulat, Iva Bušić, Fran Rašić, Alan Ivković

CR62 Complex treatment of a patient with Churg-Strauss syndrome
Tomica Bratić, Sara Fares

CR63 Diagnosing testicular adrenal rest tumors in an adult patient with unrecognized congenital adrenal hyperplasia
Lana Kavur, Tina Dušek

CR64 Positive effects of intranasal oxytocin and oral Caralluma Fimbriata on the reduction of hyperphagia in a patient with Prader-Willi syndrome
Haris Ahmić, Petra Sulić, Marija Škoro, Mario Ćuk

CR65 Latent Epstein-Barr infection as a probable contributory factor for hepatic lesion in immunosuppressed patient with ulcerative colitis
Paula Pavlek, Lucija Skalicki, Ivan Štimac Rojtinić, Nikola Škreb, Marko Banić, Marija Crnčević Urek

CR66 Late onset grand-mal epilepsy in elderly patient
Lucija Skalicki, Paula Pavlek, Ivan Štimac Rojtinić, Nikola Škreb, Melita Grd

CR67 Implementation of continuous ambulatory peritoneal dialysis (CAPD) in chronic renal insufficiency
Ivan Štimac Rojtinić, Lucija Skalicki, Paula Pavlek, Nikola Škreb, Ivan Durlen

CR68 Taussing-Bing syndrome
Anamarija Prišćan, Anđela Krstulović Opara, Luka Katić, Goran Međimurac

CR69 Severe sclerotic chronic Graft-versus-Host Disease – multidisciplinary approach
Matea Hodonj, Dražen Pulanić

CR70 Identifying imminent visual loss after unremarkable eye trauma
Stjepan Bulat, Iva Bušić, Fran Rašić, Benedict Rak, Mirjana Bjeloš

CR71 Bell's palsy in a breast carcinoma patient undergoing chemotherapy
Nikola Škreb, Paula Pavlek, Lucija Skalicki, Ivan Štimac Rojtinić, Jagoda Stipić

CR72 Challenges of extragonadal germ cell tumor – importance of multidisciplinary team
Antonia Mrdeža, Fran Rode, Marija Gamulin

CR73 Leukocytoclastic allergic vasculitis
Marko Perojević, Tea Stipetić, Sandra Marinović Kulišić

CR74 Localised form of granulomatosis with polyangiitis in young adult
Filip Bosnić, Laura Karla Božić

CR75 PCSK9 inhibitors- promising new treatment option for chronic kidney disease patients with refractory dyslipidemia
Vito Bošnjak, Luka Blagus, Bojan Jelaković

CR76 Pauci-Immune Glomerulonephritis
Luka Blagus, Vito Bošnjak, Ana Jelaković

CR77 The first Croatian child with genetically confirmed Pyridoxine - Dependent Epilepsy (PDE) - an atypical scenario
Iva Mohler, Mario Ćuk

CR78 Delayed leukoencephalopathy with optic neuritis after endovascular coiling of a cerebral aneurysm
Bruno Horvat, Nika Jemrić, David Ozretić, Ivan Jovanović, Darija Mahović Lakušić

CR79 Severe eye pain induced by physical activity in a healthy young man – expect glaucoma!
Iva Bušić, Stjepan Bulat, Fran Rašić, Benedict Rak, Mirjana Bjeloš

CR80 Primary sclerosing cholangitis - a challenging indication for liver transplantation
Iva Bušić, Magdalena Kujundžić, Goran Kurdija, Robert Ledenko, Jelena Popić, Anna Mrzljak

CR81 CASE REPORT: Recurrent melanoma diagnosis reached with the help of dermoscopy
Jaka Radoš, Katarina Radoš, Anamarija Raguž

CR82 ST-elevation myocardial infarction (STEMI) in a 22 years old male after alcohol and cocaine intoxication
Marija Škoro, Petra Sulić, Haris Ahmić, Ivan Gornik

CR83 Intracranial hemangiopericytoma – can patients be safe from tumor recurrence?
Valerija Plečko, Karlo Pintarić, Eva Pera, Martina Petrinović, Mirta Peček, Matea Milanović, Anna Mrzljak

CR84 Case report: multidisciplinary approach to a patient suffering from tetraparesis as a result of autoimune enchephalitis and multiple cerebral venous thrombosis
Tomislav Cigić, Duje Čulina, Mislav Pap, Porin Perić

CR85 Multidisciplinary treatment of the malignant middle cerebral artery infarction – A CASE REPORT
Ivana Karla Franić, Anamaria Dukić, Ana Gašić, Branko Malojčić

CR86 Henoch Schönlein purpura – IgA vasculitis – a case report
Kiarash Pourmodjib

CR87 Poor outcome of twin anemia polycythemia sequence: case report
Ana Boka Drmić, Iva Bilić Čače

CR88 The art of recognizing pain amplification syndrome in children
Vana Vukić, Ana Smajo, Lovro Lamot

CR89 Case report: Therapeutic- hypothermia in cardiac arrest patient
Boris Kos, Stjepan Frkanec, Vedran Velagić

CR90 Gastric adenocarcinoma complicated by postoperative septicemia
Marin Glavčić, Barbara Goršeta, Goran Glavčić

CR91 Presentation of a patient with chroniclow back pain and general symptoms
Damir Mišura, Vid Mirošević, Mislav Pap, Porin Perić

CR92 Procalcitonin – a false alarm in osteogenesis imperfecta patients?
Fran Rode, Antonia Mrdeža, Marinko Vučić

CR93 Complex cardiovascular defects in a male infant with Williams syndrome juxtaposed with survey results illustrating other patients' experiences
Bartosz Szmyd ,Filip Karuga , Agnieszka Gach ,Tomasz Moszura, Marek Kopala, Maria Respondek-Liberska

CR94 Prolactinoma causes infertility in men
Barbara Goršeta, Marin Glavčić, Velimir Altabas

CR95 Elfin face" as main clinical sign of a Williams Beuren syndrome: case report of two patients
Ivana Jurić, Nika Pušeljić, Silvija Pušeljić, Lucija Todić

CR96 Osteogenesis imperfecta type IIC with mutation of the COL1A1 - variant of unknown significance
Nika Pušeljić, Ivana Jurić, Petra Raguž, Lucija Todić, Silvija Pušeljić

Clinical Medicine

CM01 Needle arthroscopy: revolutionary diagnostic method for knee imaging
Hana Hajsok, Tomislav Čengić

CM02 Prevalence of preoperative anemia
Antun Zvonimir Kovač, Nataša Kovač

CM03 Correlation of Preoperative Computed Tomography, Endoscopic Intraoperative Findings and Histopathologic Findings in Early Laryngeal Cancer
Antonela Geber, Ayla Hadžavdić, Andro Košec

CM04 Prognostic impact of mean platelet volume/platelet ratio in patients with diffuse large B-cell lymphoma
Dorian Laslo, Vlatka Periša

CM05 The most common medication side effects in internal medicine emergency department
Lucija Strmota, Gabrijela Buljan, Dora Cesarec, Ana-Marija Novak, Juraj Jug, Ingrid Prkačin

CM06 The role of MRI in diagnosis of Alzheimer's disease
Lester Toni Dobrić, Ivona Ćudina, Marijana Radić, Fran Borovečki

CM07 Frequency of HER2 receptor overexpression and HER2 gene amplification in acinar type of lung adenocarcinoma
Marija Vušanović, Sonja Zelović Stamatović, Miloš Stamatović, Ljiljana Vučković, Mirjana Miladinović

CM08 Surgical treatment of medical complications in drug addicts-our experience
Rašić Fran, Bušić Iva, Bulat Stjepan, Ivkošić Ante

CM09 DA-R-EPOCH as front-line treatment for high-risk diffuse large B-cell lymphoma (DLBCL) of the elderly patients: single center study
Neno Živković, Sandra Bašić-Kinda, Marijo Vodanović, Ivana Ilić, Lea Galunić Bilić, Ivo Radman, Igor Aurer

CM10 Etiology of ischemic stroke in young adults
Sabina Srbljinović, Sara Stalman, Ana Boban

CM11 CAS with and without cerebral protection - incidence of new brain lesions on MRI
Sara Zadro, Filip Živić, David Ozretić

CM12 The emergency medical care of patients with ste-mi – MONA
Marija Škoro, Petra Sulić, Ivan Gornik

CM13 Interventricular septal thickness as a diagnostic marker of fetal macrosomia
Bartosz Szmyd, Filip Karuga, Malgorzata Biedrzycka, Magdalena Rogut, Prof. Maria Respondek-Liberska

Literature review

LR01 Hypothyroidism during pregnancy
Mia Šelović

LR02 Glucocerebrosidase gene mutation and Parkinson disease
Hanna Pasic, Luka Vujevic, Antonela Blazekovic

LR03 Immunotherapy in advanced non-small cell lung cancer treatment
Robert Gečević, Lester Toni Dobrić, Ivona Ćudina, Robert Likić

LR04 Hemolytic anemia as side effect of usage of antimicrobial drugs in people with glucose 6 phosphate dehydrogenase deficiency
Ivona Ćudina, Robert Gečević, Lester Toni Dobrić, Kristijan Harak, Robert Likić

LR05 The potential of virtual reality in the treatment of phobias
Lester Toni Dobrić, Kristijan Harak, Ivona Ćudina, Robert Gečević, Robert Likić

LR06 Ketogenic diet and Alzheimer's disease
Laura Tomić, Petra Sulić

LR07 Novel coronavirus (COVID19) and its effects on nervous system. A Literature review.
Lucija Pešorda, Eva Pleško, Mladen Pospišil

LR08 Chloroquine as effective treatment for 2019-nCoV infection
Tin Šklebar, Lorena Karla Rudež, Robert Likić

LR09 Oxytocin promises hope in the treatment of hyperphagia in Prader-Willi syndrome
Petra Sulić, Haris Ahmić, Marija Škoro, Tomo Trstenjak, Mario Ćuk

LR10 Trifarotene for treatment of acne vulgari
Luka Vujevic, Hanna Pasic

LR11 The relationship of the evening chronotype and social jetlag in the context of unhealthy behaviors
Strelchenia Olesia

LR12 Antidepressants: Background, Advantages and Disadvantages, Solutions and Future Implications
Dora Herceg

LR13 Ketamine and esketamine for treatment of unipolar depression
Hanna Pašić, Luka Vujević

LR14 Benefits of using NSAIDs prior to the ERCP
Marija Radić, Lara Gudelj, Robert Likić

Other

O01 "Cherish your heart"– a public health project on cardiovascular health
Tomislav Piršljin, Nikola Erceg, Iva Karla Crnogorac, Ivan Čukman, Martina Čuljak, Lara Divjak, Stjepan Herceg, Ana Piršljin, Filip Puškarić, Lara Gudelj, Karlo Grudić, Lucija Hoblaj, Ayla Hadžavdić

O02 POLYPILL vs. POLYMEAL approach for control of cardiovascular risks in Croatia
Lara Gudelj, Marija Radić, Robert Likić

ABSTRACTS

ABSTRACTS

Invited Speakers

IS01
The past, the present and the future of Deep Brain Stimulation

Darko Chudy, M.D., PhD

School of Medicine, University of Zagreb
Clinical hospital "Dubrava"

The idea of chronic electric stimulation of neuroanatomical structure to improve status of some neurological patients originates from 1960's when neurosurgeon would use electric stimulation to prove the position of electrode. Electric stimulation abolishes tremor if the lead was in proper thalamic nuclei and then they perform coagulation. Using the modern technological solution the neurosurgeon uses chronic electric stimulation (deep brain stimulation) to suppress symptoms of neurological disease. Pierre Pollack and Alim Lui Benabid promoted a very successful method for diminishing all three cardinal symptoms of Mb Parkinson. They used simulation of subthalamic nuclei. Later Phillipe Coubes from Montpellier stimulated globus pallidus internus to improve patients with dystonia very successfully. Successes in deep brain stimulation of patients with movement disorders moved clinical neuroscientists to try with another neuroanatomical structures for some other neurological and psychiatric diseases like obsessive compulsive disorder, Gill de la Tourette syndrome, epilepsy and etc. However even in medical literature some very odd proposals for deep brain stimulation were published, like memory and intelligent improvement or mood and behavior disorder. Substantial improvement was done recently in a technical solutions like rechargeable batteries, directional electrodes or magnetic resonance compatible neurostimulators.

IS02
Robots and brains: robotics in neurosurgery

Luka Drobilo, M.Sc.

Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb
Clinical hospital "Dubrava", Zagreb

Through widespread application in industry robots have proven to be reliable, precise, and efficient, with an ever-increasing number of new applications in various fields of human activities emerging in recent years. Healthcare is not an exception to that trend, continually pursing research to enable more precise, reliable, and less invasive procedures. Although dozens of surgical systems have been in development throughout the years, many of them have not reached certification and commercial application. This lecture will consider some of the benefits and disadvantages of using robots in neurosurgery, as well as consider some of the neurosurgical robots currently certified for use and those being developed. The second part of the lecture will shed some light on the topic from an engineering perspective and discuss some of the challenges encountered by engineers while developing such a system. Finally, some visions and new research directions shall be presented to stimulate a discussion on the direction in which emerging technologies could lead further developments in neuroscience.

IS03
Autonomic Nervous System: from theory to practice

Associate Professor Mario Habek, M.D., PhD

Department of Neurology, Clinical Hospital Centre "Zagreb"
School of Medicine, University of Zagreb

The autonomic nervous system (ANS) is the part of the central and peripheral nervous system that regulates functions which are mostly independent of human will. This includes vital functions such as breathing, blood pressure maintenance, heart rate regulation, sweating, digestion, urination, sexual functions. Each of the organ systems responsible for these functions is regulated by the ANS and its two inseparable parts, the sympathetic and parasympathetic system which exert an antagonistic effect on the end organ in question. Although both exhibit constant tonic activity the predominance of one or the other is determined by specific external or internal stimuli that the person is exposed to. A flight-or-fight reaction is typical for sympathetic activity with an increase in heart rate and blood pressure and centralization of the circulation. On the other hand the parasympathetic system is more active in the rest-and-digest circumstances and causes energy conservation and stimulation of the digestive system. A detailed knowledge of ANS physiology is important for understanding implications of ANS dysfunction in various ANS diseases. In this talk we will explore ANS dysfunction in multiple sclerosis from molecular level over the neurophysiological testing in the laboratory and finally symptoms that patients are experiencing.

IS04
Experimental models of neurodegeneration: the STZ story

Jan Homolak, M.D., PhD candidate

Department of Pharmacology, School of Medicine, University of Zagreb

Neurodegenerative diseases are a group of complex disorders characterized by a progressive loss of structure and function of neural tissue. Although substantial efforts are directed towards solving the mystery of yet unresolved etiopathogenesis of these disorders, a challenging translation of basic neuroscientific principles from in silico and in vitro experiments towards more complex biological systems often results in poor identification of critical biomedical principles, and limited success in the process of development of new therapies. The lecture will discuss the concept of translation of the basic scientific principles to more complex biological systems with a focus on animal models of neurodegeneration, and present a developmental path of one such model - a rat model of sporadic Alzheimer's disease induced by the development of brain insulin resistance following intracerebroventricular administration of streptozotocin first established at the University of Zagreb School of Medicine.

IS05
Neural coding of behaviour in the rodent associative cortices

Bartul Mimica, mag. psych., PhD

Kavli Institute for Systems Neuroscience, Norway

The burgeoning field of computational neuroethology is invested in making sense of large streams of data that offer a detailed quantitative account of animal behavior in conjunction with neural recordings and manipulations. However, the specifics of how the rodent brain represents parameters related to natural behavior during unrestrained bodily motion still await characterization. To address this issue, we tracked the heads and backs of eleven freely moving rats in 3D, measuring whole-body behavior with the type of resolution that in the past was achieved for single effectors and typically in head-fixed animals. Simultaneously, we used chronically implanted silicone probes to record >1000 single units from the posterior parietal (PPC) and secondary motor (M2) cortices, as prior work suggested that these areas might represent ongoing and impending orienting movements. Surprisingly, our analyses revealed strong and reliable tuning to posture of the head, neck, and back across both targeted regions. In contrast, the signals for movement were less prevalent. Both areas had topographically organized head and back representations, while simultaneous recordings showed that spiking in PPC tended to precede that in M2. The paired unit recordings were sufficiently robust to decode the bodily state of an animal and they suggest both PPC and M2 strongly represent posture by using a spatially organized, energetically efficient population code.

IS06
Clinical Neuroscience of Music: Applications of music in the health sciences

Marija Pranjić, MA, MMus, NMT, Phd candidate

Music and Health Science Research Collaboratory, University of Toronto

The role of music in therapy has undergone significant changes since the early 1990s. For many decades, music has been perceived solely as a carrier of sociocultural values within the therapeutic process. However, with the advent of modern cognitive neuroscience and brain imaging techniques, a historical paradigm shift occurred shedding new light on music as a highly complex sensory language that engages cognitive, affective, and sensorimotor processes in the brain. The research in neuroscience and music has quickly become a fascinating topic of study resulting in numerous publications and findings linking auditory rhythm and music to the motor and cognitive functions. Consequently, translational biomedical research has led to the development of "clusters" of evidence that show the effectiveness of specific music interventions established within the scientific and theoretical framework of Neurologic Music Therapy (NMT). Endorsed by the World Federation of Neurorehabilitation, Neurologic Music Therapy is based on the premise that the scientific bases of music therapy are found in the neurological, physiological, and psychological foundations of music perception and production (Thaut & Hoemberg, 2014). Therefore, music does not only operate as a cultural artifact but as a therapeutic agent that can engage widely distributed neural networks. The aim here is to present the state-of-the-art research in neuroscience and music with regard to the biomedical applications in the health sciences.

Thaut, M., & Hoemberg, V. (Eds.). (2014). Oxford Handbook of Neurologic Music Therapy. Oxford: Oxford University Press.

IS07
Psychosis: concepts and the biology underlying these phenomena

Aleksandar Savić, MD, PhD

Department of Forensic Psychiatry, University Psychiatric Hospital "Vrapče"

Psychosis, characterized by changes in perception (hallucinations) and thoughts (delusions) and leading to difficulties in testing of reality, arguably represents the paradigmatic psychiatric disorder. Psychosis is also colloquially conflated with "insanity" and consequently burdened by a number of negative connotations, which leads often to negative portrayals in media and stigmatization of individuals with psychotic disorders. Already difficult paths to care and reintegrating into society are thus made even more complicated. While a common opinion is that when talking about psychosis we necessarily mean schizophrenia, schizophrenia spectrum disorders represent only a fraction (albeit a significant one) of all psychotic disorders or situations in which psychosis cam emerge. We are today aware that a certain number of individuals from general population experience phenomena that can be considered psychotic, but never go on to require psychiatric assistance. In addition, we are aware of a number of general medical conditions that can cause psychotic episodes, and that increased awareness helps in faster identification of possible reversible causes like anti-NMDA receptor encephalitis. Dopamine theory remains the leading way of conceptualizing biology that underlies psychosis, especially since all of currently available medications used for treating psychosis modulate dopamine neurotransmission. However, in line with new insights into the role disruptions in widely distributed brain networks, such as default-mode network or thalamo-cortical networks, play in psychotic disorders, we are forced to re-conceptualize the models we used to explain biological underpinnings of schizophrenia and other psychotic disorders. Functional neuroimaging techniques represent a safe way of examining changes in brain activity in psychosis, and have allowed us to identify those changes across different disorders and relate them to clinical variables.Ever-expanding knowledge about biology of psychosis puts us on the road to identifying state- and trait-markers of psychosis and specific psychotic disorders. This, within the context of a staging model and with the shift in focus towards first-episode psychosis and prodromal states, offers a promise of meaningful predictive models that might lead us to early identification of at-risk states and application of early interventions for these debilitating disorders.

IS08
White matter interstitial neurons: past, present and future

Assistant Professor Goran Sedmak, MD, PhD;

Croatian Institute for Brain Research, University of Zagreb School of Medicine

White matter interstitial neurons (WMIN) are special group of cells located within the gyral white matter. The WMIN neurons are remnant of the transient subplate population. Although, they constitute large population of neurons in the human cerebral cortex, the exact function of WMIN is still largely unknown. Furthermore, the research into WMIN have been troubled with many problems. During the 19th and beginning of 20th century these cells were often considered as signs of pathology (e.g. neurons arrested during migration in white matter). The discovery of subplate neurons provided the first glimpse into their origin and provided evidence that they are normal part of the human brain. In recent years the main problem plaguing the WMIN research is how to define them. There is still no single molecular marker that would define them as a separate population. Therefore, often different neurons are included into this population which leads to heterogeneous, and sometimes contradictory findings. However, WMIN are important for normal functioning of the cerebral cortex and in many disorder (e.g. schizophrenia, autism, depression, Alzheimer's disease, etc.) their number, location and molecular profile are often disturbed. In this lecture we will trace the meandering road of WMIN discovery, present knowledge about their function and importance for human brain development and evolution and further steps necessary to elucidate their true meaning for the human cerebral cortex.

IS09
I Just Don't See You Like That: Atypicalities in visual face perception

Mirta Stantić, B.Sc.

University of Oxford

Our ability to perceive and recognize faces seamlessly is a fundamental and essential cognitive ability that underlies the most basic of our interactions in the social world. In a healthy visual system, this ability matches or outperforms even the most advanced face recognition computer vision algorithms and allows us to glean plenty of crucial information in a matter of milliseconds. Despite the importance of this ability, we have little understanding of the mechanism that underlies it or reasons for its failure in atypical groups of perceivers, most commonly people with Autism Spectrum Disorder (ASD) or Developmental Prosopagnosia (DP). This talk reviews the neural findings in face perception using functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) to seek a neural underpinning of these deficits. I review some more recent theories explaining face agnosia with research from diffusion tensor imaging (DTI) and finally present a promising avenue from my own research using Fast Periodic Visual Stimulation (FPVS) as a potential neural correlate of face perception difficulty.

IS10
The making of the human brain: lessons learned from technology

Lana Vasung, M.D., PhD

Harvard Medical School
Fetal-Neonatal Neuroimaging Development Neuroscience Centre, Department of Newborn Medicine, Boston Children's Hospital

Prenatal human brain development is characterized by rapid structural and functional changes influenced by genes and the environment. Although histology remains a gold standard, the development of neuroimaging tools and techniques opened new venues to study normal and abnormal structural and functional brain changes that occur prenatally. With advances in quantitative MRI and machine learning, the way we think, treat or manage patients during the pregnancy and newborn period started to change. In this short talk, we will address some of the most important neuroimaging advances expected to help us develop antenatal/postnatal guidelines and clinical risk stratification tools for early interventions, treatments, and care management decisions in the most vulnerable populations of pregnant women and their offspring.

IS11
New developments in the understanding of the CSF hydrodynamics

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[d] *Ruđer Bošković Institute, Department of Molecular Biology, Zagreb, Croatia*

Introduction:

Cerebrospinal fluid (CSF) formation rate had been extensively studied using so called «ventriculo-cisternal perfusion» technique. This technique and equation for calculation of CSF volume formation are based on the assumption that substance marker dilution happens because of newly formed CSF in choroid plexuses in lateral and third ventricles. However, it also had been shown that substance marker dilution inside the CSF system does not occur because of newly formed CSF but rather as a consequence of a number of other factors met in ventriculo -cisternal perfusion technique such as velocity of perfusion, changes in colloid and hydrostatic pressures during perfusion etc.

Material and methods:

Unlike classical ventriculo-cisternal perfusion technique we studied CSF formation rate in cat animal model where aqueduct of Sylvius was microsurgicaly opened and entire CSF from lateral and third ventricles was collected into external tube. The newly developed Time-Spatial Inversion Pulse (Time-SLIP) method makes it possible to directly visualize the flow of CSF using magnetic resonance imaging (MRI) technique and permitting the CSF hydrodynamics to be depicted in certain time frame.

Results:

The CSF dynamics as visualized by Time-Slip method differ significantly from unidirectional and bulk flow classical understanding of CSF physiology. Direct measurement (without any substance marker) in cat animal model suggests that under physiological pressure there is nor net CSF formation neither the unidirectional circulation of CSF within the brain ventricles.

Conclusions:

Research of CSF dynamic has gone to higher level. By studying animal models and with innovative MR technique we have now better understanding of basic CSF physiology than ever before.

ABSTRACTS

Basic Science

BS01
Development of a new method of aortic valve decellularization using the supercritical extraction technology

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Keywords: Decellularization, supercritical carbon dioxide, aortic valve

Valve replacement remains the last therapeutic option for patients with severe aortic valve dysfunction unsuitable for valvular reconstruction. The tissue-engineered heart valve portends a new era in the field of valve replacement. One of the most promising techniques for tissue and organ regeneration is decellularization, in which extracellular matrix is isolated from its native cells and genetic material in order to produce a natural scaffold. Decellularized heart valves are of great interest as a scaffold for the tissue-engineered heart valve due to their naturally bioactive composition. One of the disadvantages of currently used decellularization protocols is long duration of the process (14 days). The object of the study was an ovine aortic root (56). The effectiveness of decellularization was evaluated by DNA quantification. Mechanical tests were carried out at EZ Test facility. Statistical processing of data was carried out by standard methods. Differences were considered significant at $p<0.05$. In contrast to the classical processing of detergents in a solution, the developed protocol made it possible to completely eliminate nuclear material. The level of residual DNA decreased from 5.14 ± 0.01% ref. after classical treatment up to 2.70 ± 0.22% ref. after extraction in scCO2 medium. The hybrid treatment with detergent solutions for 24 hours and the subsequent extraction in scCO2 medium for 3 hours (t = 37 C, P = 15-25 MPa) made it possible to extract cells whilst maintaining the extracellular matrix structure. Thus, the combined treatment (detergent + scCO2) makes it possible to obtain cell-free intact matrices.

BS02
Apoptotic and corticogenic aspects of brain regeneration after stroke

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Keywords**:** schemic stroke, apoptosis, brain repair, MRI, bioluminescence

INTRODUCTION/OBJECTIVES: Our goal was to find the correlation between apoptosis and corticogenesis after transient brain ischemia.

MATERIALS AND METHODS: An animal model of stroke was induced in transgenic NFH-Luc2-TurboFP635 male mice by temporary occluding the middle cerebral artery. Mice were observed on days 0, 3 and 7 for neurological deficits and *in vivo* bioluminescent imaging was also conducted using luciferin and VivoGlo™ reagent to show the signal that represents viable neurons and their apoptosis, respectively. MRI was used to visualize and measure ischemic lesion in the brain after stroke. Mice brains were isolated on day 7 and stained by immunofluorescence (IF) using the markers of corticogenesis (SatB2, Ctip2).

RESULTS: On the 3rd day, after the arterial occlusion, the ischemic brain lesion appeared the largest, which positively correlated with neurological deficit. Luciferine and VivoGlo™ both had increased bioluminescence signal at day 7. Corticogenesis markers (SatB2, Ctip2) used in immunohistochemistry showed higher IF intensity of on the ischemic, than in contralateral hemisphere.

CONCLUSION: Regeneration in ischemic brain is a complex process involving increased both, apoptotic and corticogenic markers, and their crosstalk still remains to be elucidated at the molecular level.

BS03

BPC 157 pentadecapeptide reduces oxidative stress levels in renal tissue affected by acute unilateral ischemic renal injury

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Keywords: renal ischemia, oxidative stress, BPC 157

We examined the effects of BPC 157 therapy on oxidative stress following acute unilateral ischemic renal injury in rats. Medication (/kg) (BPC 157 (10 μg)(treated group) or saline (5 ml)(control group)) was applied as an abdominal bath immediately after the right renal artery ligation. USB microcamera was used to record the gross anatomy of the affected kidney. 24h after ligation oxidative stress was quantified using thiobarbituric acid-reactive species (TBARS) as malondialdehyde (MDA) equivalents. Tissue samples were homogenized in phosphate-buffered saline (PBS, pH 7.4) containing 0.1mM butylated hydroxytoluene (BHT) and sonicated (30sec) in an ice bath. 10% trichloroacetic acid (TCA) was added, the mixture was centrifuged (3,000rpm, 5min), and the supernatant collected. 1% TBA was added, and samples were heated (95°C, 60 min). Tubes were then kept on ice (10min). Following centrifugation (14,000rpm, 10min), the absorbance of the mixture (wavelength: 570nm) was determined. The concentration of MDA was read from a standard calibration curve plotted using 1,1,3,3'-tetra ethoxy propane (TEP). Lipid peroxidation was expressed as MDA using a molar extinction coefficient of 1.56×105mol/L/cm. Protein concentration was determined using a commercial DC Protein Assay Kit. Control rats exhibited a larger area of renal infarction and higher levels of oxidative stress (nmol per mg of protein) (59.01±4.43). The treated group showed reduced renal infarction and lower levels of oxidative stress (25.03±3.23), closer to values found in healthy renal tissue (15.18±2.61). BPC 157 therapy reduces the severity of renal ischemic injury and lowers the levels of oxidative stress in affected renal tissue.

BS04

Abdominal venous system hypertension as splenectomy complication leads to intracranial venous sinus hypertension and cerebral edema, pentadecapeptide BPC 157 therapy

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Keywords: splenectomy, abdominal venous hypertension, intracranial venous sinus hypertension, BPC 157

We explored BPC 157 as a therapy option for splenectomy induced series of complications in rats. This included portal vein (PV), inferior vena cava (IVC) and superior mesenteric vein (SMV) hypertension combined with abdominal aorta (AA) hypotension, resulting in superior sagittal sinus (SSS) hypertension and cerebral edema. Medication (/kg) (BPC 157 (10 μg)(treated group) or saline (5 ml)(control group)) was applied as an abdominal bath immediately after splenectomy. Rats were assessed 10min, 3h, and 24h after splenectomy. Intravascular cannulation (PV, IVC, SMV, AA) was performed to obtain blood pressure values. USB microcamera recording was used to examine the gross anatomy of targeted abdominal blood vessels. Rats also underwent craniotomy followed by USB microcamera recording of the brain parenchyma together with visible cerebral blood vessels and, finally, SSS intravascular cannulation. Splenectomized rats exhibited PV, IVC and SSS hypertension, AA hypotension (mmHg) (10min: 19±3 PV, 12±3 IVC, 12±2 SSS, 84±4 AA; 3h: 28±4 PV, 22±3 IVC, 17±1 SSS, 87±2 AA; 24h: 38±4 PV, 41±4 IVC, 20±2 SSS, 68±3 AA) and significant cerebral venous congestion and parenchymal edema. BPC 157 normalized blood pressure (10min: 8±1 PV, 16±2 IVC, 0±1 SSS, 102±5 AA; 3h: 11±2 PV, 13±3 IVC, 3±1 SSS, 98±3 AA; 24h: 12±4 PV, 20±4 IVC, 4±1 SSS, 92±3 AA) and notably reduced ensuing cerebral venous congestion and edema. BPC 157 prevents abdominal aorta hypotension, abdominal venous and intracranial venous sinus hypertension and cerebral edema development as post-splenectomy complications.

BASIC SCIENCE

BS05

Levels of Neuropeptides among the Gut-brain Axis are Affected by DPPIV/CD26 Deficiency during Colon Inflammation in Mice

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Keywords: Dipeptidyl-peptidase IV/CD26, Neuropeptide Y, Vasoactive intestinal peptide.

Neuropeptide Y (NPY) is a gut–brain peptide found in the central and enteric nervous system with controversial role in inflammatory events. Vasoactive intestinal peptide (VIP) is as well a neuropeptide secreted in brain and gut, with potential protective effect on intestinal mucosa. The hypothesis of this research was that dipeptidyl-peptidase IV/CD26 (DPP IV/CD26) plays an important role in intestinal inflammation, by influencing circulating and tissue levels of neuropeptides among the gut-brain axis.
Crohn's-like colitis model was induced in CD26 deficient and wild type mice. NPY and VIP concentrations and protein expressions as well as DPP IV/CD26 enzymatic activity have been determined at both systemic and local levels by ELISA and Western blot techniques.
Our study revealed constitutionally significantly ($p<0.05$) higher serum VIP concentrations in conditions of CD26 deficiency, reaching their maximum values in the acute phase of colitis in serum as well as gut and brain tissue. NPY concentrations in the gut were increased in both mice strains in acute inflammation as well, with significantly ($p<0.05$) higher values in CD26 deficient mice. DPP IV/CD26 enzymatic activities among the gut-brain axis were also found to be altered.
The results of our study indicate a causal connection between levels of NPY and VIP, inflammatory events among the gut-brain axis and the activity of DPP IV/CD26. Therefore, DPP IV/CD26 has been confirmed to play an important neuroimmunomodulative role in colitis pathogenesis, which should further be evaluated in order to develop new potential therapeutical approaches.

BS06

Pentadecapeptide BPC 157 counteracts portal and caval hypertension and aortal hypotension in rats with SMVocclusion in relation with no-system involvement

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Keywords: BPC157, NO-system, SMVocclusion

We focused on the superior mesenteric vein (SMV) occlusion and stable gastric pentadecapeptide BPC 157, and NO-system involvement with L-NAME and L-arginine application. Medication (BPC 157 (10 μg, 10 ng)), L-NAME (5 mg), L-arginine (100 mg) or saline (5 ml) (in control rats)) was applied as an abdominal bath immediately after SMV occlusion. At the end of the 15 min, rats with SMV occlusion show huge SMV, portal (PV) and inferior caval vein (ICV) hypertension and mild aortic hypotension (means±SD mmHg, 59±4 (PV), 30±4 (SMV), 43±4 (ICV), 80±3 (abdominal aorta (AA))) which were markedly opposed in BPC 157 rats (14±4 (PV), 5±2(SMV), 8±4 (ICV), 117±3 (AA)). When given L-NAME or L-arginine there were venous hypertension (L-NAME 39±4 (PV), 26±4 (SMV), 64±4 (ICV); L-arginine 82±4 (PV), 74±4 (SMV), 48±4 (ICV)) and aortal hypotension (L-NAME 107±3; L-arginine 72±3). BPC 157, given with NO-agents, L- NAME (BPC 157+L-NAME) or L-arginine (BPC 157+L-arginine) markedly opposed their effects on venous hypertension (BPC 157+L-NAME 17±4 (PV), 12±4 (SMV), 8±4 (ICV) BPC 157+L-arginine 38±4 (PV), 32±4 (SMV), 28±4 (ICV)) and aortal hypotension (BPC 157+L-NAME: 118±3, BPC 157+L-arginine 111±4). Given alone BPC 157 and L-arginine reduced the stomach, duodenum, jejunum, cecum and colon lesions, while L- NAME aggravated jejunal and colonic lesions. BPC 157 given with NO-agents maintained its original beneficial effect. In conclusion, these beneficial effects in rats with SMV-occlusion indicate that pentadecapeptide BPC 157 counteracts portal and caval hypertension and aortal hypotension, and GI-lesions in relation with NO-system involvement.

BS07

BPC 157 kidney recovery effects in rats with UUO (unilateral ureter obstruction) and hydronephrosis

Hrvoje Vraneš[a], Nora Knez[a], Irma Stilinović[a], Vilim Dretar[a], Tajana Đurašin[a], Slaven Gojković[a], Lana Sučec[a]

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Keywords: kidney, hydronephrosis, UUO, BPC 157

Using a well-designed rat model of unilateral ureter obstruction (UUO) as an example of renal injury, we have demonstrated the effect of stable gastric pentadecapeptide BPC 157 on reducing hydronephrosis. After 72 hours of ureteral ligation, rats developed symptoms of unilateral ureter obstruction such as hydronephrosis, fibrosis development, tubular cell damage, and interstitial inflammation. 72 hours after ligation, the ureter was deligated and BPC 157 (1µg/kg/1mL bath/rat) was applicated locally in group of treated animals, and saline bath (1mL) was applicated in the same way to control group. Then, animals were sacrificed after 2 intervals: 24 hours and 96 hours, and the kidneys removed, observed, sectioned, and scored (by grade 0-3 depending on hydronephrosis severity). Also, the volume of water consumed and the urination of urine was measured for 24 hours in 24 hours interval groups. The kidneys of rats treated with stable gastric pentadecapeptide had less developed hydronephrosis (score 0 or 1) and little to no lesions after both intervals of deligation (24 and 96 hours), whereas control rats had more severe hydronephrosis (score 2 or 3) and often considerable lesions after deligation periods. Recovery was better in animals after 96 hours of deligation. Also, animals treated with BPC 157 drank less water than control animals and urinated almost as much volume of liquid as they drank, whereas control animals drank more and urinated less. In conclusion, we documented multiple beneficial effects of hydronephrosis treatment by BPC 157.

BS08

Pentadecapeptide BPC 157 therapy in bile duct ligated (BDL) rats

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Keywords: pentadecapeptide BPC157, bile duct ligation

We hypothesized that BPC 157 therapy in bile duct ligated (BDL) cirrhosis rats counteracts increased pressure in the superior sagittal sinus and thrombosis formation. BPC 157 counteracts the piecemeal necrosis, focal lytic necrosis, apoptosis and focal inflammation, disturbed cell proliferation, cytoskeletal structure in the hepatic stellate cell, collagen presentation (Mallory staining). In anesthetized 8week BDL rats, we made a single burr hole in the rostral part of the sagittal suture, above the superior sagittal sinus, cannulated the anterior part of the sinus by Braun intravenous cannules, and measured intravascular pressure, before and after medication (BPC 157 10µg, 10ng/kg, or saline, 1 ml/rat given intragastrically). Portal and caval hypertension and aortal hypotension and thrombosis were assessed. Healthy rats exhibit the following pressure values: superior sagittal sinus (SSS) between -26 and -28 mmHg; portal pressure (PP) between 3 and 5 mm Hg or like the pressure in the inferior caval vein(ICV) (providing at least 1 mm Hg higher values in the portal vein); abdominal aorta(AA) blood pressure values between 100 and 120 mm Hg at the level of bifurcation. BPC 157 counteracted considerably increased pressure values in the SSS (33±2 mmHg (controls) vs. -24±2 (µg), -26±2 (ng)). There were also counteracted PP (40±5 mmHg (controls) vs. 7±2 (µg), 8±2 (ng)), ICV (30±2 mmHg(controls) vs. 5±2 (µg), 7±2 (ng)) and AA (83±3 mmHg(controls) vs. 121±2 (µg) , 119±2 (ng)). In rats with cirrhosis and portal hypertension, BPC 157 may be useful also in the conditions of the increased incranial pressure and vessels obstruction.

BS09

BPC 157 counteracts intracranial hypertension and severe portal and caval hypertension, aortal hypotension, thrombosis, gastric and duodenal lesions in rats

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Keywords: BPC, rat, sagittal sinus, thrombosis, intracranial pressure

We studied the severe gastric and duodenal lesions along with the severe portal and caval hypertension and aortal hypotension and widespread thrombosis with the superior sagittal sinus ligation and central blood flow stasis. BPC 157 therapy has been used in alleviating vascular occlusion disturbances, further applied in rats with the SSS ligation. In rats with inferior caval vein occlusion, BPC 157 counteracted venous hypertension and aortal hypotension, and thrombosis formation. BPC 157 counteracted bile duct ligation-induced liver cirrhosis and portal hypertension. 2 burr holes were made in anesthetized rats, each 2 mm laterally from the middle of the sagittal suture, and a Vicryl suture was used to make a ligation in the middle of the SSS. Then, we made a single burr hole in the rostral part of the sagittal suture, above the SSS, and cannulated SSS anterior part by intravenous cannules, and measured intravascular pressure, before and after medication.Portal and caval hypertension and aortal hypotension and thrombosis and gastric and duodenal lesions were assessed as described. SSS ligation disturbed pressure in SSS induced portal hypertension, caval hypertension and aortal hypotension and widespread thrombosis and duodenal lesions. While venography studies show collaterals rapid presentation, centrally and peripherally, all BPC 157 regimens rapidly reverse brain swelling, and the consequences of the SSS ligation. SSS, portal, caval and aortal pressure were close to normal. BPC 157 counteracts IH, and thereby, severe portal and caval hypertension and aortal hypotension, widespread thrombosis, gastric and duodenal lesions.

BS10

Expression pattern of lncRNA H19 and MALAT1 in the peripheral circulation of patients with calcific aortic valve stenosis - preliminary data

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Keywords: Heart valve diseases; calcific aortic valve stenosis, lncRNA, biomarkers

Calcific aortic valve stenosis (CAVS) represents the most prevailing form of degenerative heart valve diseases. Morbidity and mortality associated with this disease is constantly growing and with the current trends in demographics and increase of elderly population it reaches epidemic proportions thus posing a substantial health and economic burden facing the worldwide societies. Currently there are no effective pharmacological remedies to prevent or slow the progression of CAVS and aortic valve replacement (AVR) is still the only successful clinical therapy. To gain insight into the expression and biomarker potential of lncRNA molecules in the pathogenesis and clinical manifestation of CAVS, we performed a preliminary analysis of lncRNA H19 and MALAT1 expression in the peripheral circulation of CAVS patients (indicated AVR; n = 15) and healthy control subjects (n = 15; age and gender matched with patient group). Total RNA was isolated from 1 ml of blood plasma and reverse transcribed into cDNA using Trizol reagent and High fidelity cDNA Reverse Transcription Kit. qRT-PCR analysis was performed using a CFX-96 qRT-PCR detection system, commercial, gene-specific qPCR primers and SYBR Green PCR Master Mix. The obtained data were analyzed using the 2-ΔΔCT method. GAPDH gene expression values were used as endogenous control. The results showed an increased (1.3-fold) albeit statistically nonsignificant expression of H19 lncRNA in the peripheral blood of CAVS patient compared to healthy control group. MALAT1 lncRNA expression was not observed in any group of subjects. Further research could provide better insight of biomarker potential of H19 lncRNA in CAVS-disease.

BS11

Pentadecapeptide BPC 157 counteracts portal hypertension, caval hypertension, aortal hypotension, activates bypassing pathway in rats with superior mesenteric artery occlusion

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Keywords: BPC 157, hypertension, hypotension, NO-system

We focused on the 15 min superior mesenteric artery (SMA) occlusion, stable gastric pentadecapeptide BPC 157 therapy and NO-system involvement with L-NAME and L-arginine application. Medication (/kg) (BPC 157 (10 µg or 10 ng), L-NAME (5 mg), and/or L-arginine (100 mg) or saline (5 ml) (controls)) was applied as an abdominal bath immediately after SMA occlusion. At the end of the 15 min, rats with SMA occlusion exhibit PV and ICV hypertension, severe aortic hypotension (controls- PV: 47±3 mmHg, ICV: 32±3 mmHg, aorta: 70±3 mmHg), which were markedly opposed (BPC 157- PV: µg:17±4 mmHg, ng:15±4 mmHg; ICV: µg:11±3 mmHg, ng:10±4 mmHg; aorta: µg:97±3 mmHg, ng:95±4 mmHg). Accordingly, superior mesenteric vessels thrombosis was markedly attenuated in both vein and artery (SMV 0.0301±0.001 g (controls) vs. 0.0095±0.0009 (µg), 0.0099±0.0007 (ng) and SMA 0.0238±0.001 g (controls) vs. 0.0072±0.0009 (µg), 0.0080±0.0008 (ng)). Angiography (at 5 min ligation-time) and USB microscope camera assessment show bypassing pathway inferior mesenteric artery (IMA)-arch of Riolan- SMA, along with inferior anterior pancreaticoduodenal artery presentation to replete original SMA flow. Given alone, L-NAME and L-arginine have the opposite effect on lesions. L-arginine counteracted lesions while L-NAME aggravated stomach lesions. Given together (L-NAME+L-arginine), L-NAME could not completely antagonize the beneficial effect of L-arginine. BPC 157 given with NO-agent(s) maintained its original beneficial effect. These beneficial effects in rats with SMA-occlusion indicate that pentadecapeptide BPC 157 counteracts GI tract lesions, portal and caval hypertension and aortal hypotension, activates the bypassing pathway and acts in relation with NO-system involvement.

BS12

BPC 157 effect in alcoholized rats counteracts increased ICP, portal and caval hypertension and aortal hypotension, with cloth formation

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Keywords: BPC, alcohol, rat, hypertension, hypotension

We hypothesized that, in addition to the severe gastric lesions, the Robert's classic instillation of the 96% alcohol in the rat stomach may induce increased intracranial pressure, portal and caval hypertension and aortal hypotension, along with both venous and arterial cloth formation, which may be counteracted by the addition of BPC 157, a novel cytoprotective agent. To evaluate intracranial pressure in anesthetized rats, we made a single burr hole in the sagittal suture rostral part, above the superior sagittal sinus, cannulation of the sinus anterior part by Braun intravenous cannules for intravascular pressure measurement before and at 5 min after instillation of the 96% alcohol into the rat stomach and medication application (BPC 157 10µg, 10ng/kg, or saline, 1 ml/rat given intraperitoneally). Portal and caval hypertension and aortal hypotension and thrombosis were assessed along with hemorrhagic gastric lesions presentation. Healthy rats exhibit: superior sagittal sinus pressure between -26 and -28 mmHg; portal pressure between 3 and 5 mm Hg or like the pressure in the inferior caval vein; abdominal aorta blood pressure values between 100 and 120 mm Hg at the level of bifurcation. BPC 157 counteracted considerably increased pressure values in the superior sagittal sinus (controls) vs. There were also counteracted portal hypertension, caval hypertension and aortal hypotension. Accordingly, thrombosis was markedly attenuated. Antiulcer BPC 157 effect in 96% alcohol instilled-rats counteracts increased intracranial pressure, portal and caval hypertension and aortal hypotension, along with both venous and arterial cloth formation.

ABSTRACTS

Case Reports

CR01
Dirofilariasis in ophthalmology emergency department

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Keywords: dirofilariasis, ophthalmology, microscope, nematode

Dirofilariasis is a state of parasitic infection in humans and animals caused by dirofilaria, a genus of nematodes or roundworms. Domestic and wild mammals are natural host and the infection is accidentally transmitted to humans by mosquito bites. 57-year-old Croatian woman came to an ophthalmology emergency department of UHC Sisters of Mercy with a sudden red eye, no other symptoms or systemic diseases. There was no history of recent travelling abroad, insect bite, stitching, injury or allergy. After clinical examination, which involved visual acuity and slit lamp, conjunctival chemosis with a motile, coiled worm like structure could be seen under bulbar conjunctiva in the temporal space of the eye. Diagnostics, ultrasound and computer tomography of right orbit were alright. Patient has undergone surgery in local anaesthesia under the microscope where after opening conjunctiva, approximately 10 cm long worm has been removed. Worm was sent to Croatian Institute of Public Health which they classified as dirofilarial species. Ocular occurrence is rare, but still present in our population, so we have to keep that in mind while examining patients in the emergency department. We report fifth incidence in the last five years of live ocular dirofilariasis in Croatia. Unfortunately, evidence of ocular dirofilaria is not regular, and there is no exact incidence of it since the first one was noticed. With climate changing, parasites are also changing their hosts and are becoming more present in humans.

CR02
Pigmented epithelioid melanocytoma - borderline melanocytic tumor

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Keywords: PEM, skin tumor, HMB-45, Ki-67

Pigmented epitheloid melanocytoma (PEM) is a low-grade melanocytic tumor with metastatic potential and is histologically indistinguishable from animal-type melanoma (ATM) and blue nevus (BN). There are no clear histological criteria separating metastazing from non-metastazing PEMs. Their origin remains unknown. A 40 year old female patient noticed the appearance of a new mole on the skin of her right thigh in March 2019 which kept enlarging in a few last months. She visited her physician in February 2020. The lesion showed homogeneous blue and black pigmentation during dermoscopy. The lesion was excised in total and sent to patohistological analysis. The skin sample with slightly elevated, dark blue tumor that measured in greatest diameter 0,6 cm was admitted to pathology. The tumor was made of heavily pigmented epithelioid and spindled melanocytes which filled papillary and infiltrated reticular dermis. Tumor was mitotically active and three mitoses were found. There was no necrosis, ulceration, lymphocapillary invasion or atypical mitosis. Immunohistochemically tumor cells were diffusely positive for HMB-45, and proliferation activity measured by Ki-67 was up to 5%. Greatest thickness of tumor was 2,12 mm and was located 1 mm from the nearest lateral border of excision and 4,5 mm from the base. The diagnosis of PEM was made. PEM frequently metastasizes to lymph nodes but most patients have a favorable outcome. Therefore, PEM is considered a borderline melanocytic tumor. There is general disagreement in which cases sentinel lymph node biopsy should be applied, and an individual approach to the patient is recommended.

CR03

Case report: Blastic plasmacytoid dendritic cell neoplasm (BPDCN)

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Keywords: BPDCN, hematology, malignancy, skin lesions

Blastic plasmacytoid dendritic cell neoplasm (BPDCN) is a rare and aggressive hematologic malignancy of the bone marrow and blood that can affect other organs such as the central nervous system and skin. It combines features of leukemia, lymphoma and skin cancer, making the disease difficult to diagnose. Herein, we present a patient with recently diagnosed BPDCN. A 72-year old male patient was presented to the department of internal medicine for further diagnostics of his symptoms. He had skin lesions on his head ,neck and thorax. Lesions were livid ,elliptical and most prominent on his thorax. Biopsy of skin lesions demonstrated an infiltrate of atypical, intermediate-sized blasts with round, irregular nuclei that extends to the dermis and the subcutaneous fat. Bone marrow biopsy showed no signs of infiltration. Immunohistochemically, cells were CD7 positive, CD3 and CD20 negative and CD56 nonspecific. These findings go in favor of BPDCN. Patient was started on CHOP regimen. After 6 chemotherapy cycles a significant reduction of the tumor mass and regression of skin lesions has been noticed. Blastic plasmacytoid dendritic cell neoplasm typically responds to chemotherapy regimens used to treat other hematological malignancies. However, in most of the cases the disease rapidly recurs. Therefore, new drugs such as tagraxofusp have been tested in clinical trials. High response rates and acceptable toxicity have been registered, even though long-term outcomes are not well defined. While the progress has been made, there are a lot of questions about this aggressive disease that need to be answered.

CR04

Posttransplant lymphoproliferative disease after liver transplantation

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Keywords: liver, posttransplanat complication, EBV negative

Viral infections in particular Epstein-Barr virus (EBV) are risk factors for PTLD. Herein, we present a case of EBV negative PTLD after liver re-transplantation. A 63 year old female patient underwent liver transplantation in 2014 due to HCV-related cirrhosis. The reccurence of the primary disease led to severe graft dysfunction, and two years later she was re-transplanted. She received combination therapy for HCV consisted of sofosbuvir, ledipasvir and ribavarin. Her immunosupression consisted of mycophenolate mofetil, cyclosporine with steroid taper. Her posttransplant follow-up was unremarkable until 3 years later when she noticed enlarged lymph nodes of the neck and inguinum. An extensive work-up revealed mesenterial and perisplenic lymphadenopathy with splenomegaly, elevated lactate dehydrogenase (1658 U/L) microcytic anemia and elevated beta2-microglobulin. Fine needle aspiration cytology of the lymph node showed atipical, partially degenerative changed lymphatic cells, immunohistochemically positive on CD20, confirming the diagnosis of large B-non Hodgkin lymphoma. EBV-DNA was not detectable. Patient received two cycles of rituximab and was planned to receive chemotherapy R-CHOP. The patient died due to septic complication. In conclusion PTLD is a rare complication after organ transplantation. Unlike most cases of PTLD this case shows EBV negative patient with history of HCV infection considered as a risk factor. Post-transplant population has a high risk of developing new infection or reactivating a latent one. Considering problem in managment of PTLD is the need for reduction of high immunosuppression therapy which can lead to transplant rejection.

CR05

Polycystic liver-kidney disease and brain aneurysms: how should we handle the issue?

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Keywords: Polycystic liver-kidney disease, transplantation, cerebral aneurysms

Polycystic liver disease (PLD) co-occurs in majority of cases with polycystic kidney disease (PKD). Unlike renal involvement, which ultimately leads to destruction of parenchyma and end-stage kidney disease (ESKD), liver insufficiency is seldom a feature of PLD. PLD simptomatology is mainly due to hepatomegaly. In addition to cystic liver-kidney involvement, some patients develop cerebral aneurysms. The PLD treatment of choice is influenced by the size and distribution of cysts within the liver, concomitant disorders and the nutritional status. An asymptomatic 63–years-old female was diagnosed with PLD and PKD in 12/2013. Her kidney function was impaired (eGFR 29 ml/min), her liver function (PV 0,98, albumin 45 g/L, bilirubin 8 mmol/L) was normal, and she remained in the long-term follow-up. In 11/2014 a brain CT scan confirmed 6 aneurysms of the right internal carotid artery, and she underwent a successful coil embolisation. Over the following years her kidney function deteriorated and in 2019 she started intermittent haemodyalisis. Her liver function remained stable, but the liver volume increased affecting her quality of life, therefore she has been wait listed and is currently awaiting simultaneous liver-kidney transplantation. The management of patients with PLD may be challenging due to disease itself and concomitant disorders necessitating long-term follow-up by a multidisciplinary team. Even asymptomatic, patients should be screened for cerebral aneurysms and promptly treated to avoid devastating consequences. The scarcity of currently available treatment progressively leads to ESKD and liver enlargement when renal replacement therapy and surgery remain the only treatment options.

CR06

Aplastic crisis induced by human parvovirus B19 as an initial presentation of hereditary spherocytosis in a child– a case report

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Keywords: aplastic crisis, human parvovirus B19, hereditary spherocytosis

INTRODUCTION A transient, self-limiting aplastic crisis is a rare manifestation of parvovirus (PV) B19 infection, usually seen in patients with underlying haemolytic anaemias. The virus has a predilection for infecting the erythroid progenitor cells of the bone marrow resulting in their lysis and red cell aplasia, although white cell and platelet counts may also decline. We herein report aplastic crisis induced by PV B19 infection unmasking hereditary spherocytosis in a boy. CASE PRESENTATION A 11-year-old boy presented with high-grade fever, headache, drowsiness, sore throat, and a rash. On admission he was conscious, but sleepy, drooling, with pale skin and conjunctivae. Physical examination revealed macular, somewhere petechial rash involving the neck and extremities, tachycardia, systolic murmur and hepatosplenomegaly. Complete blood count revealed RBC of 2.34 x1012/L, with haemoglobin concentration of 64 g/L and reticulocytopenia, WBC 1.3×109/L, and platelet count 75×109/L. Spherocytosis was present on the peripheral blood smear. Bone marrow aspirate showed suppressed erythropoiesis. The PV B19 infection was diagnosed by polymerase chain reaction (292 000 000 DNA copies/ml of blood) and positive serology for specific anti-PV B19 IgM. Osmotic fragility testing showed increased fragility of erythrocytes, which was consistent with the diagnosis of hereditary spherocytosis. The boy was treated by blood and platelet transfusions and supportive care, and was discharged after 9 days of hospital care with improved blood count. CONCLUSION PV B19 induced aplastic crisis can be the first manifestation of hereditary spherocytosis. PV B19 infection must be considered in the differential diagnosis in patients with acquired aplastic anaemia.

CR07
Hepatic epithelioid hemangioendothelioma and liver transplantation

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Keywords: epithelioid hemangioendothelioma, vascular liver neoplasm, liver transplantation

Hepatic epithelioid hemangioendothelioma (HEHE) is a rare vascular neoplasm of endothelial origin with uncertain biological behaviour. The greatest challenge in vascular neoplasm pathology lies in differentiation of HEHE from hepatic angiosarcoma and defining the further treatment. Correct diagnosis is of utmost importance and it is based on the integration of clinical, radiological and histological findings. A 35-year-old asymptomatic female with an unremarkable medical history underwent a routine check-up ultrasound which detected multiple hypoechogenic liver lesions. Liver MRI revealed 15-20 T1-hypointensive focal lesions in both liver lobes (max. 20 mm). PET/CT showed multiple hypodense and hypovascular lesions with no signs of extrahepatic dissemination. Needle core biopsy of the liver confirmed an epithelioid hemangioendothelioma with focal necrosis and infiltration of adjacent liver parenchyma. Given the unresectability of the tumor, the patient underwent liver transplantation (LT). The histology report confirmed multifocal HEHE with metastasis in one hilar lymph node (FNCLCC grade 2). Five years later, the patient is unremarkable with no signs of HEHE relapse or dissemination. The diagnosis of HEHE may be challenging because of its rarity and overlapping features with hepatic angiosarcoma. Due to its unpredictable natural course and malignant potential, liver transplantation remains a therapeutic mainstay for the treatment of HEHE.

CR08
Infection of sellar region imitating pituitary macroadenoma – a case report

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Keywords: hyperprolactinemia, hypopituitarism, pituitary gland, Pseudozyma aphidis, sphenoiditis

Infections of sellar region are rare conditions with nonspecific symptoms that are usually misdiagnosed as other pituitary lesions. The risk factors include an immunocompromised host, trauma, meningitis and paranasal sinusitis. A 37-year old female was referred to the Department of Endocrinology under the suspicion of a pituitary macroadenoma. Her medical history revealed that she had been suffering from chronic sinusitis. Additionally, she had recently developed frequent headaches, diplopia and galactorrhea. In October of 2018. she underwent surgery for sphenoiditis during which a fungus Pseudozyma aphidis was isolated and subsequently treated with voriconazole. Later on, a nasal swab test revealed Mycobacterium abscessus infection which was presumed to be the underlying cause of chronic sinusitis and fungal coinfection. MRI revealed inflammation of the pituitary gland spreading from sphenoid bone and compressing the pituitary stalk. According to hormone test results she had hyperprolactinemia presumably due to pituitary stalk compression, as well as low free thyroxine and normal thyroidstimulating hormone levels suggesting suppression of pituitary thyrotropic cells. In addition to that, Synacthen test indicated damage of corticotropic cells as well. The patient was treated with hydrocortisone, L-thyroxine and antimicrobial medication. A control MRI showed regression of the inflammation process. Therapy was discontinued upon normalization of hormone levels. An infection of the sellar region can imitate pituitary adenoma because of its compression effect on the pituitary gland which may cause hypopituitarism and hyperprolactinemia. In this case conservative treatment with a combination of medications led to favorable results.

CR09
Segmental pulmonary embolism

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Keywords: Pulmonary embolism, pulmonary artery occlusion, dalteparin, rivaroxaban

Pulmonary embolism (PE) refers to an acute condition caused by blockage of an artery in the lungs. PEs usually arise from a venous thrombosis in the pelvis or legs. Emboli break off and pass through the venous system to the right heart and proceed to the pulmonary arteries. A 79- year-old male patient, with an extensive amount of comorbidities, presented to the Emergency Department with constant piercing pain radiating from the back to the lateral thoracic wall during inspiration. The breathing was shallow with no abnormal sounds on auscultation. The patient reported no chest pain or difficulty breathing. There were no other abnormalities present in the physical status. Vital signs were normal including BP 140/90 mmHg, HR 63 bpm, SpO2 97% at room air and body temperature 36.1°C. ECG revealed ST segment depression and T wave inversion in the V3-V6. Blood test came out unremarkable besides elevated CRP (59 mg/L) and D-dimer values (0.95 mg/L). Thoracic X-ray showed a hypertonic heart configuration with a shallow right lateral phrenicocostal sinus. CT pulmonary angiography confirmed right segmental pulmonary artery occlusion with the atelectasis of the right lower lobe. Diagnosis was made of right segmental pulmonary artery embolism. Prescribed treatment consisted of spasmolytic and analgesia intravenously and dalteparin subcutaneously. The patient declined further hospitalization and was released home with rivaroxaban prescription. PE is a life threatening condition with secondary complications such as arrhythmias, pulmonary infarction and even death. Quick and precise diagnostics and prompt treatment lower the risk of complications and shorten recovery time.

CR10
A Case of Compensated Extremely Severe Chronic Anemia in a Patient with Hereditary Hemorrhagic Teleangiectasia

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Keywords: anemia, hereditary hemorrhagic telangiectasia, Rendu Osler Weber disease

Hereditary hemorrhagic telangiectasia (HHT, Rendu Osler Weber disease) is a rare disorder characterized by vascular defects with variable manifestations including chronic bleeding from gastrointestinal angiodysplasias and other arteriovenous malformations. Here we present an extremely severe anemic patient with HHT and several other comorbidities, but still compensated despite laboratory-verified severe chronic iron-deficiency (ID) anemia. A 58-year-old male with HHT presented with resting dyspnea and feeling of exhaustion. He complained of profuse recurrent epistaxis during past several weeks. The patient had been receiving bevacizumab for HHT treatment, tranexamic acid and iron supplementation. He had a history of recurrent gastrointestinal bleeding caused by angiodysplasias and severe epistaxis. In addition, two years ago, he was diagnosed with liver cirrhosis, caused by chronic hepatitis B virus infection. The patient also had type II diabetes (on insulin therapy) and chronic kidney disease. Upon presentation, he was hemodynamically stable. Clinical examination revealed pallor, telangiectasias of the face and oral cavity, a systolic murmur with normal pulse and blood pressure. Laboratory findings indicated an extremely severe microcytic ID anemia (hemoglobin 26g/L, MCV 67.1fL, hematocrit 0.094). He was hospitalized and received multiple doses of erythrocyte concentrate transfusions, parenteral iron and other supportive therapy. He was discharged after several days, feeling well with a hemoglobin value of 100g/L. Patients with recurrent bleeding, such as patients with HHT, might have extremely severe chronic ID anemia with relatively mild to moderate clinical presentations because of maximum utilization of compensatory mechanisms. This shows the importance of placing laboratory values in the clinical context.

CR11

Chelation therapy related proteinuria in Wilson's disease: How should we handle the issue?

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Keywords: Wilson's disease, liver cirrhosis, D-penicillamine, liver transplantation

Wilson's disease (WD) is a rare autosomal recessive disorder of copper metabolism, mainly affecting liver and brain. Medical therapy is effective for most patients, however, their side effects should be managed properly. Liver transplantation (LT) may rescue those with acute liver failure or advanced disease. A 55-year-old man was diagnosed with WD according to the Leipzig criteria (plasma ceruloplasmin 0.0972 g/L; hepatic copper concentration 319 μg/g; increased urinary copper; absence of neuropsychiatric symptoms or Kayser-Fleischer rings and Coombs-negative hemolytic anemia; negative mutation analysis). His liver enzymes were elevated and liver biopsy revealed advanced fibrosis (Ishak stage 5-6/6). His diagnostic work-up showed no focal liver lesions, patent hepatic blood vessels, splenomegaly and esophageal varices. His kidney function was normal with no proteinuria. Chelation therapy with D-penicillamine (DPA) was initiated and several months later the patient presented with decompensated cirrhosis and nephrotic-range proteinuria (5 g/L). His serum creatinine was normal (88 μmol/L). DPA was replaced with zinc acetate and proteinuria subsequently improved (1.6 g/dU) with the resolution of ascites and leg edema. The patient remains in the long-term follow-up and is currently waitlisted for LT. D-penicillamine is effective in stimulation and excretion of urinary of copper, however it may be associated with numerous side effects including proteinuria. Proteinuria may be detected early, but it is typically a late adverse event and requires immediate discontinuation of DPA. LT should be considered as a treatment option for patients with advanced disease who fail to respond to medical treatment.

CR12

Recurrent hepatic encephalopathy in a young girl with fulminant autoimmune hepatitis type 2

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Keywords: fulminant, liver, encephalopathy

Hepatic encephalopathy (HE) occurs in patients with liver failure and manifests with neuropsychiatric abnormalities, intellectual impairment and depressed level of consciousness. Damaged liver´s inability to metabolize ammonia and other substances causes their accumulation. Ammonia crosses blood-brain barrier and is metabolized by astrocytes for glutamine synthesis. High glutamine levels causes swelling of astrocytes, producing brain edema- leading to alterations in patient´s mental and neurological status. We present a 4-year old girl with fulminant liver failure and severe recurrent HE. A previously healthy girl presented with vomiting, abdominal pain and jaundice. Laboratory tests showed elevated aminotransferase (30xULN), conjugated hyperbilirubinemia, coagulopathy, hypergammaglobulinemia, positive LKM-1 autoantibody and hyperammonemia (95 umol/L). Neurological status was normal (GCS 15). Autoimmune hepatitis type 2 was diagnosed and treatment with corticosteroids and symptomatic therapy was started. Initial therapeutic response was satisfying. After five days her neurological status deteriorated (irritability, drowsiness, GCS 7) to HE grade II-III with increasing levels of ammonia (194 umol/L) that could not be controlled with infusions of sodium benzoate. She was admitted to Intensive care unit (ICU) where mechanical ventilation, antiedematous therapy and hemodialysis were started. Despite treatment brain MRI showed diffuse cytotoxic edema. Mechanical ventilation and hemodialysis continued for 13 days, after which she completely recovered (GCS 15, normal brain MRI). Three days later her neurological status deteriorated again (GCS 5), with rising ammonia levels (170 umol/L), despite relatively stable liver function. Due to recurrent and severe HE she was put on the emergency livertransplant list, but unfortunately died during the procedure. The unpredictable nature of HE in fulminant liver failure makes the evaluation and decision for the optimal timing for liver transplant challenging.

CR13

Successful treatment of a patient with chronic myeloid leukemia and a V379A mutation using nilotinib

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Keywords: chronic myeloid leukemia, V379A mutation, resistant to imatinib, nilotinib

We describe a patient diagnosed with chronic myeloid leukemia (CML) in chronic phase who initiated treatment with frontline imatinib and switched to nilotinib following the development of secondary resistance because of a V379A mutation. This case report is probably the first one reported regarding outcomes in patients who have switched from imatinib to nilotinib following the identification of a V379A mutation. The 26-year old male patient was diagnosed with CML in July 2014. At the time of diagnosis his laboratory results were: Hb 129g/L, WBC 219.07x10⁹/L, Plt 311x10⁹/L. Physical exam revealed splenomegaly and bone marrow analysis resulted in CML, Philadelphia chromosome positive with translocation t(9:22). His RT-PCR was positive for BCR-ABL p210 (isoform b3a2=e14a2). The patient was treated initially with hydroxyurea, and after confirmed diagnosis, he started treatment with imatinib 400mg daily in August 2014. After 12 months of treatment, major molecular response (MMR) was not achieved, and the patient was tested for mutation analysis of BCR-ABL. The point mutation V379A in ABL1 was detected which is categorized as „resistant to imatinib“. The patient was switched to nilotinib in September 2015. In 3 months, he managed to achieve MMR. Until January 2020, the patient remains in complete hematological, cytogenetic and molecular response and continues nilotinib 800mg daily. Today, most patients with CML have good long-term prognosis, including a life expectancy comparable to that of the general population. This is one of the scarce reports about the mutation V379A, where we have managed to achieve MMR in CML patient with nilotinib.

CR14

Tonsillar carcinoma after renal transplantation – the impact of immunosuppression

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Keywords: tonsillar carcinoma, solid organ transplantation, immunosuppression

Malignomas are a serious complication after renal transplantation(RT) and a second leading cause of death. Oropharyngeal carcinomas are common and have been associated with the HPV-infection, use of immunosuppressive (IS) drugs, tobacco and alcohol. In 2018 a 40-year old man underwent his second RT with a cadaveric graft. Six years before he received his first RT for Michelis-Castrillo syndrome, which failed due to chronic humoral rejection (treated with steroids, plasmapheresis and bortezomib). His induction IS on both transplants included basiliximab, while his maintenance IS consisted of tacrolimus, sirolimus, mycophenolic acid and prednisone. Prior to his second RT his preoperative screening was unremarkable. His medical history was negative for alcohol and tobacco use. After the second transplant he was treated successfully for antibody-mediated and acute cellular rejection with steroids and plasmapheresis. Five months later cervical lymphadenopathy was noticed. Enlargement of his left tonsil with cervical lymph nodes was confirmed on the MSCT. Because of inconclusive FNAB of enlarged cervical lymph node, nasopharyngeal and oropharyngeal biopsies were performed including left-side tonsillectomy. Findings revealed p16-positive tonsillar squamous cell carcinoma (pT2cN1cM0). Consecutive management included radiotherapy and salvage neck dissection. His IS was unmodified and closely monitored, which resulted in stable graft function. Repetitive pre-transplant screening and posttransplant follow-up

are necessary to minimize the risk of malignomas. A cumulative dose of immunosuppression increases the risk of malignancy after transplantation. Tonsillar carcinoma after RT is a rare entity and can be managed by surgical and oncological approaches, although the optimal management remains an area of ongoing research.

CR15
Drug-induced liver injury in chronic liver disease

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Keywords: liver, cirrhosis, chemotherapy, iatrogenic injury

Drug-induced liver injury (DILI) is an uncommon but significant cause of acute or chronic liver injury which may lead to liver failure. Diagnosis of DILI is difficult because there are no objective biomarkers and we still rely on causality assessments. DILI in the setting of chronic liver disease (CLD) is poorly understood and differentiating it from exacerbation of underlying liver disease is even more challenging. A 69-year old male was admitted to the hospital after developing ascites, jaundice (bilirubin 272 umol/L), elevated liver enzymes (AST 413 U/L, ALT 400 U/L, GGT 123 U/L, AP 177 U/L) following two cycles of chemotherapy (rituximab, fludarabine, cyclophosphamide) for chronic lymphocytic leukemia (CLL). His past medical history is notable for a liver disease identified as non-alcoholic fatty liver disease 15 years prior, but no treatment was necessary. Alcohol, viral and autoimmune causes were excluded. Abdominal ultrasound and CT scan revealed ascites with cirrhotic liver with no focal lesions, patent blood vessels and normal bile ducts. Liver biopsy confirmed cirrhosis without CLL infiltration. Chemotherapy was stopped, paracenteses and diuretics were initiated. Six months later his condition was stable, but liver function remained impaired (PV 0.46) with elevated bilirubin levels (673 umol/L). DILI in the setting of CLD remains challenging. Special care should be taken when prescribing chemotherapy to patients with preexisting liver disease. The risks versus benefits, as well as potential for increased hepatotoxicity among patients with impaired liver function should be carefully considered.

CR16
Vasculitis with kidney infarction as a presentation of SLE

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Keywords: vasculitis, SLE, kidney infarction

INTRODUCTION Vasculitis associated with SLE presents in few patients with SLE. It mostly presents as cutaneous vasculitis, rarely as visceral vasculitis and extremely rarely as a combination of cutaneous and visceral vasculitis. Men are more susceptible to this type of disease, especially those with positive antiphospholipid antibodies (aPL). Organ infarction rarely occurs in SLE patients without aPL antibodies. CASE REPORT A 46-year-old male patient presented with high fever, lymphadenopathy, petechial rash and dry cough. Laboratory results showed high ESR (110 mm/h), normal leukocyte, RBC and platelet count, high LDH (346 U/l) and CRP (126 mg/l), normal C3, C4 complement components, elevated D-dimers (2,16 mg/l). Combination antibiotic therapy did not improve the patient's condition. Three days later palpable purpura on the legs and cyanosis of the toes developed. Systemic vasculitis was suspected and 100 mg methylprednisolone was introduced. Skin lesion biopsy confirmed leukocytoclastic vasculitis. New laboratory tests showed low complement, high ANA and anti-dsDNA, whilst aPL and ANCA were negative. MSCT of the abdomen revealed triangular hypodensity of the left kidney upper pole. MSCT angiography confirmed left kidney infarction and anticoagulant treatment was started together with immunosuppression with glucocorticoids and cyclophosphamide. CONCLUSION Vasculitis in SLE rarely results in organ infarction in aPL negative patients. The patient was initially misdiagnosed with sepsis, then suspected to systemic vasculitis and finally diagnosed with SLE after the drop of complement and detection of ANA positivity. Only one case of kidney infarction associated with vasculitis in SLE in aPL negative patient has been reported so far.

CR17

Refractory postoperative hypocalcemia as the only sign of Celiac disease in an adult woman

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Keywords: Celiac disease, Hypocalcemia, Malabsorption

Celiac disease (CD) is an autoimmune disease of the small intestine caused by dietary gluten intake and resulting in villous atrophy. In adults the symptomatology is highly variable, ranging from dyspepsia and malabsorption to non-specific constitutional symptoms. A 43-year old woman underwent a total thyroidectomy in October of 2019 due to thyroid papillary microcarcinoma and was started on levothyroxine replacement therapy. Postoperatively, she developed severe hypocalcemia which was treated with calcitriol and vitamin D. Since her calcium levels failed to exceed 2,0 mmol/L, even with increased dosage of both medications, teriparatide was introduced as well. One month later, she presented in the emergency department with paresthesia of hands and lower extremities. Laboratory workup showed hypocalcemia that was once again refractory to treatment, and she was admitted for further testing. A notably high TSH of 88,8 mlU/L was detected which raised the suspicion of levothyroxine malabsorption. A tTg test was performed and came back positive, with tTg of 3564,7 (CU). Esophagogastroduodenoscopy revealed significant villous atrophy. Biopsy specimens confirmed the diagnosis of CD which was rated IIIc by Marsh. The patient's calcium levels were normalized with pharmacotherapy and she was started on a gluten-free diet before discharge. At her one-month check up she was still maintaining a gluten-free diet and her calcium levels were within normal range. Adult age does not exclude the diagnosis of CD. It should be considered in patients with hypocalcemia, especially one r fractory to treatment, even if gastrointestinal symptoms are absent.

CR18

Hereditary hemorrhagic telangiectasia – more than a vascular disease

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Keywords: HHT, JPS, AVMs, GI polyposis, anaemia

Hereditary hemorrhagic telangiectasia (HHT) also called Rendu-Osler-Weber syndrom is a rare autosomaldominant vascular disorder characterized with mucocutaneous telangiectasia and visceral arteriovenous malformations (AVMs) that occur in the lungs, liver, gastrointestinal (GI) tract and cerebral circulation. Dueto shared underlying mutation, juvenile polyposis syndrome (JPS) may coexist with HHT. In 2000 15-year old female was diagnosed with HHT based on the Curaçao criteria: epistaxis, visceral AVMs and first degree relative with HHT (the father). Dyspnea, fatigue and cyanosis that led to severe digital clubbing started in the early childhood. Chest CT revealed multiple pulmonary AVMs which were treated with embolization on several occasions. Brain vascular lesions were excluded. Recurrent GI bleeding led to severe sideropenic anaemia necessitating continuous substitution with iron supplements and blood transfusions. Multiple polyps in the stomach, small intestine and colon were detected on endoscopy and removed repeatedly confirming JPS. To prevent malignant GI transformation proctocolectomy was performed. The patient quality of life improved but still requires blood transfusions occasionally and remains in a long-term follow-up. Both HHT and JP are rare genetic disorders appearing at younger age. Due to multisystemic nature of the disease the patients with HHT may present with a wide spectrum of clinical manifestations, some of them even life-threatening. In individuals with coexisting JP-HHT syndrome recurrent anaemia and GI polyposis represent additional long-term management challenge.

CR19

Hydrocephalus caused by choroid plexus papilloma in a pediatric patient with genetic malformation

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Keywords: choroid plexus, papilloma, hydrocephalus, pediatrics

Choroid plexus papilloma (CPP) is a very rare, usually benign neuroepithelial brain tumor. Tumor structure is made from tufts of villi within the ventricular system that hyperproduces cerebrospinal fluid (CSF) and leads to the development of hypertensive hydrocephalus. Even though it is possible to treat hydrocephalus with medications such as acetazolamide and furosemide, definitive treatment is usually surgical. A 1-year-old female baby diagnosed with tetrasomy 9p and Dandy-Walker malformation who is in a treatment protocol for acute myeloid leukemia (AML) was admitted due to the development of hydrocephalus. After unsuccessful treatment with a ventriculoperitoneal shunt, it was removed and was replaced with external drainage of CSF. According to CT scans and large CSF drainage, diffuse villous hyperplasia of choroid plexus was suspected. Due to metabolic acidosis after treatment with acetazolamide, the only possible therapy was surgical coagulation and resection of both choroid plexuses. The biopsy during the surgery confirmed choroid plexus papilloma. Considering the development of subdural hygromas after the surgery, the ventriculoperitoneal shunt was placed again. The patient tolerated the procedure well and was returned to the AML treatment protocol. Even though the most common cause of hydrocephalus in patients with tetrasomy 9p is an obstruction, other causes must be suspected if the usual therapy isn't working. Choroid plexus papilloma is a rare cause of hydrocephalus but still, it is much more common in the pediatric population.

CR20

Posterior reversible encephalopathy syndrome in pediatric patient during induction treatment of acute lymphoblastic leukemia

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Keywords: PRES, ALL, pediatric

Posterior reversible encephalopathy syndrome (PRES) is a clinical-radiological entity that is characterized by headache, confusion, seizures and visual loss. The etiology of PRES is still unknown but it is associated with arterial hypertension, pre-eclampsia or eclampsia, renal dysfunction, several chemotherapeutic and immunosuppressant agents, among others. There has been an increasing occurrence of PRES in children with acute lymphoblastic leukemia (ALL), but after appropriate treatment clinical symptoms usually disappear. A seven-year-old female patient that was diagnosed with high-risk, Philadelphia chromosome positive ALL with complex karyotype and has received induction therapy along with tyrosine kinase inhibitor (Imatinib). Shortly after corticosteroid therapy was removed patient developed somnolence disorder, right-sided hemiconvulsions, apnea and loss of vision. An urgent neuroradiology examination was performed. MSCT showed nonspecific signs of PRES, so it was verified by an MR. The patient was treated with mechanical ventilation, antiedematous therapy and phenobarbitone. After three days of treatment in the intensive care unit there was an improvement in vision and neurological status. Due to the potential effect of Imatinib on the development of PRES, treatment with this drug was discontinued and replaced with dasatinib after patient stabilization. Although PRES is most commonly found in people with hypertension, it is often associated with taking many drugs in people with normal blood pressure. The inductive treatment of ALL include many drugs such as immunosuppressive and cytotoxic drugs, whose use is associated with development of PRES. Early diagnosis and proper treatment of PRES in patients with ALL are important for quick and full recovery.

CR21

Severe anaphylactoid reaction with hypovolemic shock and misoprostol

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Keywords: prostaglandins, anaphylaxis, misoprostol, missed abortion

The most common drugs used for the induction of abortion are misoprostol, gemeprostol, sulprostone, carboprost and dinoprost. Anaphylaxis, anaphylactoid reaction and hypersensitivity reaction are rare but possible complications of these drugs. A 34-year-old pregnant woman was hospitalized at 12 weeks of gestation with missed abortion. On admission, regular vital functions were recorded including normal temperature, pulse, and blood pressure. She was planned for medical abortion and misoprostol 400µg was administered orally. After second dose of misoprostol patient presented with low blood pressure, vomiting and diarrhea. A colloid solution and a crystalloid solution were administered. After third dose of misoprostol she immediately became pale, tachycardic, tachypneic with very low blood pressure. Immediate intravenous infusion of the colloid and the crystalloid solution with bolus of an ephedrine was administered. When the patient became stable, and her vital functions back to normal, on per vaginal examination and ultrasonically retention of the placenta tissue in the cervical canal and increased vaginal bleeding was observed. Under general anesthesia, the placental tissue and 600- 700 mL of blood were obtained. Patient was transfered to gynecological department to recovery. During that day she received a first dose of erythrocyte, colloid solutions and crystalloid solutions whereupon became hemodinamic stable. Next morning, patient received a second dose of erythrocyte and after two days she was discharged home. Posibility of anaphylactoid reaction or anaphylaxis must be kept in mind while using a misoprostol and others prostaglandin analogs. Prompt correction of vital functions remains the most effective means of good outcome.

CR22

A child with rare tubulinopathy – How to adequately assess and when to start more advanced treatment of oropharyngeal dysfunction?

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Keywords: oropharyngel dysfunction, tubulinopathy, aspiration pneumonia, malnutrition

The tubulinopathies are an complex brain malformations caused by mutation of one of seven genes encoding different isotypes of tubulin, a protein which plays a critical role in human cerebral cortex development. Clinical features includes infantile-onset epilepsy, developmental delay, hypotonia, oropharyngeal dysfunction. The treatment is rather supportive. The patient is a boy at age of 3 years presented with severe developmental delay, microcephaly (Z-4.4SDS), pharmacoresistant seizures, generalized hypotonia, poor visual contact (VEP-very low amplitudes of waves N35/P100/N135), oropharyngeal dysfunction, epileptic EEG, brain MRI-diffuse simplified giral pattern, all consistant with tubulinopathy caused by likely pathogenic de novo TUBB2A gene mutation (p.Gln292Arg). Swallowing difficulties started at age of 2 months. Severe problems including malnutrition, dehydration and aspiration pneumonia due to contaminated oral secretions and regurgitated gastric content might occure. At the begining, the problem was adequately controlled by regulating diet and food thickening. Due to disease progression and oropharyngeal deterioration, we proposed a nasogastric tube/gastrostomy feeding, and proton pump inhibitors to prevent gastric acid-induced pneumonia. Except for medication, the parents were not fully consent. Oropharyngeal dysfunction is a serious problem. To prevent potentially deadly complications, nasogastric tube, gastrostomy, and cuffed tracheotomy might be needed. With the medication we have improved the quality of life to a certain extent and avoid additional complications. However, the question remains what to do when more advanced approach will be needed.

CR23
Macrovascular coagulation with profuse gastrointestinal bleeding

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Keywords: Bleeding, DIC, hemorrhagic shock, infection

This case-report presents lethal progression of unknown infection and points out clinical thought-process in such uncommon condition. The patient (1981) presented with cold symptoms and a suspected peritonsillar abscess. Without indication for incision he was treated with amoxicillin for 4 days when he presented with fever, headache, shivering and sore throat. He was hospitalized and treated preemptively with oseltamivir because of suspected influenza. The state worsened on the 6th day when bloody stool was noted. After progression into profuse rectal bleeding he was transferred to University Hospital Centre Zagreb in state of hemorrhagic shock. Norepinephrine, erythrocytes, thrombocytes and plasma were administered. MSCT angiography did not show any sites of contrast medium extravasation (which would indicate active bleeding), but thickened and edematous wall of colon was described and interpreted as colitis. Lesser opacification of the bowel wall and nearly completely absent opacification of the splenoportal system indicated thrombosis, which together with rectal and anal bleeding and laboratory findings of coagulopathy indicated the diagnosis of disseminated intravascular coagulation (DIC). Despite the given therapy, the state progressed into acute renal and respiratory failure accompanied with acute portal hypertension and hematemesis. This severe clinical condition of unclear etiology was accompanied with macrovascular coagulation and profuse hemorrhage from gastrointestinal tract and led to death because it was refractory to the administered therapy. The following matters remain unclear: the purposefulness of previous intensive treatment, the etiology of the condition and the need for timely initiation of treatment including the evacuation of the peritonsillar purulent collection.

CR24
Granulocytic sarcoma – a rare case of extramedullary acute myeloid leukemia

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Keywords: Acute Myeloid Leukemia, Antineoplastic Combined Chemotherapy Protocols, Granulocytic Sarcoma, Hematopoetic Stem Cell Transplantation

Acute myeloid leukemia (AML) is usually characterized by abnormal proliferation of myeloblasts in the bone marrow. In rare cases, as the one presented here, cancer cells can be localized extramedullary as a tissue mass, with normal bone marrow morphology. A 30-year-old male with no prior medical history was admitted because of a swollen left shoulder. The biopsy findings of the formation were most consistent with the diagnosis of granulocytic sarcoma, confirming the diagnosis of AML. Bone marrow biopsy showed no pathological findings. The patient received induction chemotherapy according to the "3+7" protocol, consolidation chemotherapy with cytarabine and radiotherapy of the affected shoulder (30Gy/15x). After radiation treatment, a control positron emission tomography/computed tomography showed metabolically active lesions in the right iliac bone, right inguinal region and left clavicle, for which he received additional radiotherapy (30Gy/15x). Treatment was continued with allogenic stem cell transplant from a haploidentical donor. He received conditioning regiment with busulfan and cyclophosphamide and cyclosporin and methotrexate for graft-versus-host-disease prevention. The transplantation went without major complications. Granulocytic sarcoma without bone marrow involvement is an extremely rare case of AML. Because of this, the optimal time and type of treatment for these patients is not clear. Most of the patients receive the standard AML protocol, with studies reporting increased survival and decreased rate of progression to AML. Radiotherapy is also often used. Many more studies are needed to decrease the time from presentation to diagnosis and to elucidate the most appropriate treatment regimen for these patients.

CR25

Do we need broad differential diagnosis workup in patients with CIS? - A CASE REPORT

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Keywords: Clinically isolated syndrome, immunomodulation therapy

Clinically isolated syndrome (CIS) is potentially the first episode of multiple sclerosis (MS). It presents with monofocal or multifocal signs involving the central nervous system, usually with acute or subacute onset affecting young people. Red flag signs include onset after 50 years, large brain lesions or no spinal cord lesions. A 74-year old male patient presented in September 2018 with disturbances of balance and dropping of the objects from the hands. He was treated by ophthalmologist for visual impairment in both eyes two months earlier. Patient suffers from arterial hypertension, atrial fibrillation and diabetes. Brain MRI was done in January 2019 and showed hyperintensive T2 tumefactive demyelination lesion. Stereotactic brain biopsy revealed mononuclear cell infiltration. HIV, HBV and HCV test were negative and thyroid hormones were within the normal range. Broad immunology work up was done and showed normal values of antibodies. Lumbar punction revealed oligoclonal bands type 4, with normal protein and cell count. Second brain MRI was done in May 2019 and revealed new hyperintensive T2/ FLAIR cerebellar lesion. Patient was diagnosed with MS and underwent pulse corticosteroid treatment. Immunomodulation therapy with Glatiramer acetate 40 mg, three times a week was introduced. Our case presentation demonstrates necessity of broad differential diagnosis in people with red flag signs or signs of CIS but without typical demyelinating lesions on the first MRI scan.

CR26

Effectiveness of immunomodulation therapy in multiple sclerosis patient with high MRI burden - A CASE REPORT

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Keywords: clinically isolated syndrome, immunomodulation therapy

Multiple sclerosis (MS) is one of the commonest demyelinating diseases of the central nervous system. First symptoms usually appear between the ages of 20 and 40, as clinically isolated syndrome (CIS). Most often they include optic neuritis due to acute inflammation of optic nerve myelin sheath. Level of disability is quantified by the Expanded Disability Status Scale (EDSS). A 30-year old female patient presented in February 2015 due to left eye visual disturbances, pain when moving the eye and colour blindness. Brain and orbit MRI scan was done and showed left optic nerve hyperintensity. No lesions were found on cervical and thoracic spine MRI. Lumbar punction revealed oligoclonal bands type 2. Neuromyelitis optica antibodies were negative. Additional diagnostic tests showed no secondary causes for demyelination. New MRI in August 2015 revealed new gadolinium positive lesion and diagnosis of MS was established. Patient was started on immunomodulation therapy with Glatiramer acetate 40 mg, three times a week and EDSS was 0. In December 2016 follow up MRI demonstrated 6 new lesions. EDSS remained 0. In July 2018 patient developed hypoesthesia of the left half of the body and 11 new lesions on MRI were identified. EDSS was 2.0. After MRI scan and diagnostic work-up for second line treatment were done, ocrelizumab was introduced in September 2018. Appointment in July 2019 revealed no progression on MRI and EDSS was 0 again. Our case presentation demonstrates effectiveness of immunomodulation therapy in a patient with early and active MS with high MRI burden.

CR27

Role of biomarkers in establishing a diagnosis of multiple sclerosis - A CASE REPORT

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Keywords: multiple sclerosis, biomarkers, ocrelizumab

Most patients with multiple sclerosis (MS) have relapsing-remitting course with periods of new or increasing symptoms followed by periods of the partial or complete improvement. Biomarkers help in MS diagnosis and differentiation with other diseases. Level of disability is quantified by the Expanded Disability Status Scale (EDSS). A 46-years old female patient presented in 2007 with right leg weakness that lasted for a month. In 2012 she developed weakness of both legs and arms and from March 2015 she occasionally needs a cane. In December 2015 neurologic examination revealed spastic tetraparesis (motor strength in arms 4/5 and legs 3/5) with bilaterally positive Babinski sign and EDSS was 6.0. Brain MRI demonstrated several periventricular demyelinating lesions while cervical spinal cord MRI revealed longitudinal intramedullary lesion extending from the craniocervical junction up to C6 level. Paraneoplastic markers were negative and PET CT showed no signs of metabolic active malignant disease. Extensive immunological work-up was negative as well. Neuromyelitis optica antibodies were positive in University Hospital Centre Zagreb but negative in Mayo clinic and Munich. Lumbar punction showed normal levels of proteins, small lymphocytes were elevated and oligoclonal bands were type 2. MRZ reaction (measles, rubella and varicella zoster) was positive (M+R+Z+). The patient was finally diagnosed as primary progressive MS and ocrelizumab treatment was introduced. Our case presentation shows importance of biomarkers when diagnosing MS and ruling out other diseases.

CR28

Predicting long-term disability in multiple sclerosis patients - A CASE REPORT

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Keywords: Multiple sclerosis, immunomodulation therapy, Siponimod

Multiple sclerosis (MS) is chronic inflammatory disease of the central nervous system. Some patients present with more aggressive course of MS, today called highly active MS (HAMS). Level of disability is quantified by the Expanded Disability Status Scale (EDSS). A 32-years old female patient was diagnosed in 2009 with MS after clinical and diagnostic work-up revealed spastic tripparesis, numerous demyelinating lesions of the brain and cervical medulla, as well as oligoclonal bands type 2 in cerebrospinal fluid. In March 2010 Interferon beta was introduced as first line treatment (EDSS 5.0). Until 2013 patient developed 3 relapses presented with pyramidal and sensory symptoms (EDSS 5.5). Pulse corticosteroid therapy was administered in February 2015 due to new relapse (EDSS 4.5) with pyramidal and cerebellar system symptoms. After treatment EDSS was 3.0. In July 2015 second line treatment with Fingolimod was started. In 2016 left leg weakness progressed (EDSS 3.5), the patient had viral pneumonia and abnormal haematological findings (LEU 1.5, TRC 107). Fingolimod therapy was discontinued and Natalizumab was introduced in October 2016 with 30 infusions. From September 2019 patient presented with deterioration so pulse corticosteroid therapy was administered, but without therapeutic response and no new or active lesions on MRI (EDSS 6.5). This disease course indicates progression to secondary progressive MS (SPMS). Our case presentation illustrates difficulties in therapeutic approach and correlation between MRI and EDSS. One first-line drug and two second-line drugs were administered before Siponimod was introduced due to conversion to SPMS.

CR29

Diagnosis and treatment of adrenergic crisis due to pheocromocytoma

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Keywords: Adrenergic, Crisis, Pheochromocytoma

Pheochromocytomas are rare tumors which occur in less than 0.2% of patients with hypertension. Symptoms and clinical signs are the consequences of excessive catecholamine secretion. This secretion can lead to adrenergic crisis presenting with typical symptoms like headache, palpitations and sweating. Hypertensive crisis is the pathophysiological background of this life-threating condition. Patient I.B., aged 33, was hospitalized because of blood pressure oscillations and consequently, newly discovered tumor formation in projection of the left adrenal gland with radiomorphological characteristics of pheochromocytoma. Months before hospitalization, patient was having oscillations of blood pressure with occipital pulsating headache, nausea and palpitations. The day after hospitalization patient developed adrenergic crisis with hemodynamic destabilisation- extreme blood pressure oscillations (from maximal 320/180 mmHg to minimum of 70/40 mmHg) with bradycardia (55 per minute). Headache, vomiting and profuse sweating were additional symptoms. ECG also showed supraventricular tachycardia. Retrograde was determined that beta blocker (introduced into therapy to modificate treatment of firstly misdiagnosed primary hypertension threated with perindopril and amlodipine) caused excessive production of tumor catecholamines. Adrenergic crisis was treated with intravenously administered alfa blocker urapidil during hypertension and crystalloid sollutions during hypotension. After four hours of crisis beta blocker was introduced and blood pressure was stabilised. Pheochromocytomas are very important in the differential diagnosis of high blood pressure. They can present with adrenergic crisis which the most common trigger is beta blocker therapy without concomitant alfa blocade. Simultaneous use of alfa and beta blocade is an imperativ in treatment of symptoms caused by pheocromocytoma.

CR30

Raw food diet causing heavy metal (As, Hg) intoxication: a case report

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Keywords: raw food diet, mercury, arsenic, intoxication

INTRODUCTION The raw food diet comprises eating only raw and unprocessed food. It is mostly plant-based. The soil where these plants are grown can sometimes be contaminated by unhealthy substances such as heavy metals. CASE PRESENTATION A 63-year-old male patient was admitted to an internal medicine outpatient clinic with symptoms of palpitations, jaundice and high levels of arsenic (As) and mercury (Hg) in blood (34 mg/L of arsenic and 21.3 mg/L of mercury). He was also diagnosed with hepatic steatosis and a thyroid cyst. The patient neither smoked nor drank and had regular appetite, stools and urination. He was adamant that he did not have exposure to arsenic or mercury in his work or living areas. During history taking the patient mentioned practicing the raw food diet in the past year, during which he consumed about 1.5L of freshly made carrot juice per day (equivalent of 2kg of raw carrots per day). The patient was advised to immediately stop consuming carrot juice and to report for a regular check-up. After three months the patient had normal skin colour and a drop in blood arsenic and mercury levels for about 30% (As 24.3 mg/L, Hg 13.9 mg/L). After nine months the blood levels of As and Hg were normal. CONCLUSION The rise in blood levels of arsenic and mercury in this patient probably ensued following abnormally large carrot consumption. Carotenemia is a state of pseudo-jaundice caused by accumulation of beta-carotene present in the carrots. Heavy metal poisoning should be suspected in patients who adhere to similar dietary practices.

CR31
Beckwith–Wiedemann syndrome – Case report

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Keywords: Beckwith–Wiedemann, overgrowth, macroglossia, exomphalos, hypoglycemia,

Beckwith–Wiedemann syndrome (BWS, OMIM #130650) is genomic imprinting disorder with estimated prevalence of 1:10.340 live births. Physical findings are variable and can include overgrowth, exomphalos, macroglossia, hyperinsulinemia hypoglycemia, hemihyperplasia, organomegaly, and predisposition to embryonal tumors in early childhood. A male neonate was born from non-consanguineous parents at 37 weeks gestational age (GA) by spontaneous vaginal delivery to a 28-year-old G2P2 mother. Fetal ultrasonography showed exomphalos and polyhydramnios at GA 12 and 27, respectively. Physical examination at birth revealed a macrosomic infant with the body weight 4520 g (Z-score +4.17), length 55 cm (Z-score +4.62), and head circumference 37 cm (Z-score +3.41). Severe macroglossia, bilateral ear creases and pits, flat nasal bridge, exomphalos (10 cm in diameter, containing small intestine), a nevus flammeus on forehead, were consistent with a clinical diagnosis of BWS. Laboratory data revealed hypoglycemia (1.7 mmol/L) requiring high glucose intake. Right kidney enlargement was evident at abdominal ultrasound, and ECHO revealed patent foramen ovale and ductus arteriosus. After a prompt normalization of blood glucose the infant underwent surgical repair for exomphalos. During laparotomy annular pancreas, Meckel's diverticulum and gallbladder cyst were discovered as associated GI anomalies and repaired in the same procedure. Exomphalos, polyhydramnios, and macrosomia on prenatal ultrasound should rise a high index of suspicion of BWS. The increased risk for mortality, due to congenital anomalies, macroglossia, hypoglycemia, and tumors, require dedicated multidisciplinary team approach. Prognosis is generally favorable after early childhood, and their life expectancy is usually normal.

CR32
Chronic Spontaneous Urticaria Accompanied by Angioedema in a Patient with Autoimmune Thyroid Disease Resolved After Thyroidectomy

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Keywords: chronic spontaneous urticaria, thyroidectomy, Hashimoto thyroiditis

Chronic urticaria is an erythematous skin disease causing pruritus, commonly affecting up to 20% of the total population at some point during their lifetime. The link between chronic urticaria and accompanying thyroid disease is still not understood, with current treatment focusing on antihistamines and levothyroxine. We report a complete clinical resolution of chronic idiopathic urticaria (CIU) and facial angioedema in a female patient with autoimmune thyroiditis after total thyroidectomy. A 35-year-old female patient presented with CIU and facial angioedema. Oral corticosteroid therapy, antihistamines, leukotriene-antagonists, selenium, and omalizumab were all administered but the treatment was not successful. Allergies, mycoplasma infection and parasitoses were excluded. Laboratory results were negative for antinuclear antibodies (ANA) and cytoplasmic antineutrophil antibodies (ANCA). Immunoglobulins, complement levels and autologous serum testing were normal. Ultrasonography showed an inhomogeneous thyroid gland with several nodes and normal fT3 and fT4 blood levels. Anti-TPO and anti-Tg were elevated but TSH was within the reference range. Levothyroxine was then administered with no effect on the symptoms. After considering all of the available treatment options, the patient decided to undergo total thyroidectomy. Urticaria and angioedema subsided on the third postoperative day, and she remains free of symptom recurrence during 8 months of postoperative followup. The patient suffered from an extra-thyroid manifestation of subclinical Hashimoto thyroiditis. Total thyroidectomy was performed and the patient recovered well. Generally speaking, after failure of conventional therapy for CIU, a therapeutic trial of levothyroxine may become appropriate, and if unsuccessful, surgical treatment may become an option.

CR33
Interstitial lung disease in patient with rheumatoid arthritis: case report

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Keywords: Rheumatoid arthritis, interstitial lung disease, treatment of RA-ILD

Introduction: Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease associated with joint inflammation, but may also affect the respiratory system rarely. Interstitial lung disease (ILD) is the most important pulmonary manifestation of RA. The case report: A 58-year-old female was diagnosed with seropositive RA. Due to persistence of high disease activity while treated with corticosteroids and conventional therapy, treatment with TNF-α inhibitor infliximab was started and was effective until the patient started to suffer of dry cough and progressive dyspnea. All laboratory data and pulmonary function tests showed normal findings, except for transfer factor of the carbon monoxide (TLCO) which was slightly decreased (58%). HRCT showed ground-glass zones in all parts of the lung parenchyma and a mosaic attenuation pattern. She was diagnosed with ILD and her therapy was started with corticosteroids (0,5 mg/kg with tapering) and IL-6 receptor monoclonal antibody tocilizumab. After a 3-years follow up the patient felt well, without any respiratory symptoms and in RA disease remission. Control TLCO was 60% and HRCT showed improvement. Conclusion: In most cases the diagnosis of ILD comes after years of RA treatment. While TNF-α inhibitors have shown great efficacy in improving symptoms in RA, they have shown to be involved in exacerbation and new onset of RA-ILD. In our case corticosteroids and tocilizumab have shown improvement of RA symptoms and also in RA- related pulmonary disease. Creating evidence-based guidelines for establishing a diagnosis and choosing an optimal treatment strategy of RA-ILD should be our future goal.

CR34
Long term management of complex patient with common variable immunodeficiency – a case report

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Keywords: common variable immunodeficiency, long term management, multidisciplinary approach, treatment options

Common variable immunodeficiency (CVID) is a form of primary immunodeficiency that results from impaired B-cell secretion of immunoglobulins. Patients with CVID have an increased susceptibility to recurrent and chronic infections and also an increased incidence of autoimmune and lymphoproliferative disorders and cancer. A 33-year old male patient has been followed-up with the diagnosis of CVID and from early childhood he experienced recurrent respiratory infections. In January 2010, patient was admitted in GH with the symptoms of bronchopneumonia and during disease evaluation he was diagnosed with CVID. According to the guidelines, patient was treated with substitute IV immunoglobulins. During follow-up in day care and stationary UHC departments (2011 - 2020), patient experienced in total 14 respiratory (7 pneumonias, 5 acute sinusitides, 2 acute exacerbations of chronic bronchitis) and 2 digestive system (chronic gastritis, colitis) complications of CVID. Lastly, he developed noninfectious pulmonary complication - granulomatous-lymphocytic interstitial lung disease (GLILD). In 2015, CVID treatment was modified in order to accomplish satisfactory IG levels. Therefore, patient was transferred from IV to conventional IGSC therapy. Due to easier application and greater volume of SC inserted IG, patient was switched to new generation IGSC therapy in 2019. Besides that, corticosteroides and mesalazine were also administered and with current treatment patient is stable. Although respiratory infections are common CVID complications, it is also necessary to consider the autoimmune and neoplastic manifestations of the disease. Multidisciplinary approach, regular follow-up and application of immunoglobulins are the key factors in decreasing the disability and mortality in patients with CVID.

CR35

Atypical Clinical Manifestation of Common Variable Immunodeficiency: case report

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Keywords: Immunodeficiency, Mesenterial lymphadenitis, Atypical manifestation

Introduction Common Variable Immunodeficiency (CVID) is the most common primary immunodeficiency in adults, but it can also occur in children. It is characterized by hypogammaglobulinemia and an inadequate response to vaccination in the absence of other defined immunodeficiencies. Case report We present a case of a 21-year-old male patient with no history of frequent infections whose condition was manifested with intermittent fever, abdominal pain, diarrhea, and mesenterial lymphadenitis. The diagnostic workup revealed hypogammaglobulinemia, thrombocytopenia, hepatosplenomegaly, and nodular lymphoid hyperplasia of the terminal ileum. With exclusion of secondary immunodeficiency causes, as well as other primary immunodeficiencies, the diagnosis of CVID was made. After treatment with immunoglobulins, the patient showed good clinical response. Conclusion CVID is a disease characterized by a heterogenous group of manifestations, so the differential diagnosis is wide-ranging. This case report highlights the importance of a high index of clinical awareness needed for timely diagnosis and introduction of medical therapy.

CR36

Treatment of giant cell arteritis: a case report

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Keywords: giant cell arteritis, treatment of GCA, corticosteroids, tocilizumab

Introduction: Giant cell arteritis (GCA) is the most common form of vasculitis. The patients who develop it are always over the age of 50. Most often, it affects the cranial arteries, causing severe headaches and vision problems. The case report: A 69-year old woman was hospitalised because of a sustained fever of unknown origin and elevated inflammatory markers (SE 105 mm/h, CRP 175 mg/L). According to the laboratory findings, there was also a mild hepatic lesion and normocytic anemia. The general clinical status was fair except fever. Infection and malignancy were excluded. There was also no pathological deviation in immunological parameters. A Doppler ultrasound examination showed a wall thickening of the common carotid artery and its internal and external branches. MSCT aortography showed the aortic wall thickness of 3mm. A giant-cell arteritis was diagnosed. Treatment was initiated with 1mg/kg glucocorticoids given i.v., with a gradual decrease of the dose, according to the laboratory findings. After a year, a control MSCT aortography was done. It releaved a discreet thickening of the descending aortic wall. Considering elevated inflammatory markers(CRP 30mg/L, SE 40mm/h), tocilizumab was initiated. Three months after, MSCT aortography showed a complete regression of the aortic wall thickening. Conclusion: GCA is a rare disease that should be considered in elderly patients who suffer from febrility, headache, jaw claudication and also have high inflammatory parameters. Thanks to the new therapeutic options, such as Tocilizumab, the treatment of the GCA is more successful and there are much less side effects.

CR37
Occurence of Parkinsonism in Morgagni-Stewart-Morel Syndrome

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Keywords: Morgagni-Stewart-Morel syndrome, Parkinsonism, diabetes mellitus, hyperostosis frontalis interna

Morgagni-Stewart-Morel syndrome (MSM) is a rare clinical entity presenting with hyperostosis frontalis interna (HFI), headaches, hirsuitism, neuropsychiatric manifestations, hypertension and endocrinopathies such as diabetes mellitus (DM). HFI contributes to soft tissue compression and pressure atrophy of the brain. The cause of MSM in unknown, although some evidence suggests that combination of genetic and environmental factors may cause the symptoms. Parkinson's disease (PD) is a neurodegenerative movement disorder characterised by symptoms such as tremor, rigidity and bradykinesia. Following case describes the first registered coexistence of MSM and PD. A 77-year-old woman suffering from DM and hypertension presented with akinetic left hand tremor in duration of three months. Physical examination has proven subtle rigor, resting tremor and slightly slower alternating movements of both left limbs. She confirmed no usage of DA blockers or history of tick bites. Patient experiences periodical pulsating headaches with duration of few hours, without vegetative symptoms. Brain MSCT has shown early stage atrophy and frontal bilateral thickening of tabula interna resembling HFI in MSM. Levodopa in combination with benserazide is administered with gradual dose increment resulting in complete parkinsonism symptom alleviation. The patient has met the criteria for MSM, manifesting as HFI with hypertension, headache and DM. A narrow spectrum of literature describes cases of MSM and none are connected to parkinsonism. Our case represents the first connection of those two entities and implies their possible affiliation. Further research is required for better understanding of current matter.

CR38
Hemicrania continua

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Keywords: Headache, unilateral pain, exacerbations, autonomic features, indomethacin

Hemicrania continua is an uncommon primary headache disorder, mostly found in women. It is characterized by strictly unilateral dull continuous pain, with occasionally superimposed attacks of more severe pain, located anteriorly in the orbit, frontal regions or temporal regions. During pain exacerbations, there is usually evidence of cranial autonomic activation. The treatment of choice for this condition is indomethacin. The positive response to this drug is an essential criterion for the diagnosis. A 49-year old female patient is presented with an eight-year history of right-sided frontotemporal headache and diagnosis of trigeminal neuralgia. She was treated unsuccessfully with carbamazepine, oxcarbazepine, and pregabalin. In the beginning of her disease, the headaches were not continuous. For the last 7 months she suffered from continuous low-grade right-sided headache with exacerbation of severe pain located right frontoorbital and accompanied by conjunctival injection, lacrimation and nasal secretion. The attacks occur up to 7 times a day in duration of 7-8 minutes. Sometimes the pain even wakes her up at night. The neurological examination was normal. An MRI scan of the brain was also normal. Cranial magnetic resonance angiography (MRA) showed no signs of neurovascular conflict. She was started on indomethacin, 3x25 mg per day, and gastroprotective drugs. Within a few days, she had a complete regression of symptoms. The „gold standard“ in diagnosing headache is detailed anamnesis and good neurological examination. Even though this type of headache is rare, we must have it in the differential diagnosis, especially because it responds very well to treatment.

CR39

Recurrent abdominal pain and vomiting caused by a chronic midgut volvulus

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Keywords: intestinal malrotation, chronic midgut volvulus, recurrent abdominal pain, vomiting, metabolic alkalosis

Chronic midgut volvulus is caused by intermittent or partial twisting that results in lymphatic and venous obstruction and presents with bilious vomiting and recurrent abdominal pain. It poses a diagnostic challenge due to nonspecific symptoms so diagnostic delay is common. We present a case of a 12 year old girl with recurrent episodes of abdominal pain and vomiting. First presentation was at the age of 6 with episodes of abrupt vomiting during night with colic type abdominal pain. Barium X-ray revealed jejunal malposition in the left hemiabdomen consistent with intestinal malrotation, without signs of obstruction. Her symptoms gradually regressed. Five years later she presented several times in the ER with recurrent epigastric pain without vomiting and was prescribed H2 receptor blockers. During last 7 months she experienced episodes of intense vomiting. Two episodes of recurrent abdominal pain accompanied with vomiting followed before she was admitted to hospital. Both times she had metabolic alkalosis. Stools were regular. Repeated barium X-ray showed enormous dilation of stomach and proximal duodenum. CT imaging revealed jejunal spiral twist that caused luminal compression. She was diagnosed with partial volvulus and transferred to surgery department where Ladd procedure was performed. She recovered well and never experienced similar symptoms again. The aim of presenting this case is to point out an unusual cause of an usual symptom and importance of its recognition. Intestinal malrotation can present itself as a chronic midgut volvulus and an increased awareness of this entity may reduce time to diagnosis and improve patient outcome.

CR40

Finger swelling and low back pain as a sign of inflammatory disease requiring biological therapy

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Keywords: juvenile spondyloarthritis; enthesitis related arthritis; HLA-B27

Juvenile spondyloarthritis represents a spectrum of arthritis that appears in children and adolescents. ILAR classification criteria for diagnosis include arthritis, enthesitis, presence of sacroiliac joint tenderness, inflammatory lumbosacral pain, HLA-B27 positivity, positive family history and acute anterior uveitis We present a case of 16-year-old girl diagnosed with jSpA/ErA. Her symptoms started at the age of 14 with recurrent monthly swelling of the index finger. Symptoms progressed to low back pain in the morning which partly diminished with activity. Her right knee was swollen and painful. She was examined on multiple occasions by pediatric orthopedic surgeon and in pediatric emergency department before she was seen by pediatric rheumatologist. On presentation, sacroiliac joint tenderness and abnormal modified Schober test were observed. Entheses were not painful. Family history was negative for rheumatic diseases. Laboratory workup was negative, including ANA, RF. However, HLA-B27 turned positive and MRI revealed right sacroiliitis. NSAID was prescribed but symptoms nevertheless persisted; therefore, intraarticular corticosteroid application in the right knee was performed and oral corticosteroid was introduced as bridging therapy. According to ACR guidelines recommendation a therapy with TNF inhibitor was initiated. Within a month, a substantial reduction of the low back pain and decrease in disease activity were noted. Low back pain in children and adolescents might be the sign of inflammatory rheumatic disease requiring immediate treatment in order to prevent irreversible damage. Patients complaining of back pain, especially with other signs of arthritis, should be referred to pediatric rheumatologist for a further work-up and treatment.

CR41

Eltrombopag for the treatment of immune thrombocytopenia secondary to common variable immunodeficiency – a case report

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Keywords: eltrombopag, CVID, ITP, Evans syndrome

Common variable immunodeficiency (CVID) is a primary immune disorder characterized by hypogammaglobulinemia and recurrent infections. Also, it is associated with autoimmunity, most commonly presented as immune thrombocytopenic purpura (ITP) and autoimmune hemolytic anemia (AIHA). Sometimes, both ITP and AIHA are present, which is called Evans syndrome. The first-line treatment of ITP secondary to CVID is corticosteroids and intravenous immunoglobulins, while the second line is Rituximab or splenectomy. Eltrombopag is an agonist of thrombopoetin receptors used as a second or third-line treatment in patients with primary ITP. Data on the efficacy of eltrombopag in ITP secondary to CVID is sparse. Here we present a case of a 35-year-old male who was diagnosed having CVID and Evans syndrome. The patient presented in 2011 with AIHA and achieved remission with corticosteroids and rituximab. In 2014 he developed thrombocytopenia, which led to the diagnosis of ITP and CVID. During the following years, the patient had several exacerbations of AIHA which were successfully treated with pulse doses of corticosteroids. However, severe thrombocytopenia required high doses of intravenous immunoglobulins and corticosteroid treatment. Eltrombopag was initiated in 2018 at a dose of 25 mg daily. Stable platelet counts >50/μL were achieved with an average of 50 mg of eltrombopag daily and minimal doses of corticosteroids. Due to high platelet counts and an episode of acute hemolysis eltrombopag was temporarily discontinued, but platelet count reached stabile values shortly after reintroduction of treatment. Eltrombopag has demonstrated good efficacy and safety for the treatment of ITP secondary to CVID.

CR42

Metastatic progression of breast cancer with primary endocrine resistance followed by an atypical rise in Ca 125 tumor marker

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Keywords: tumor markers, breast cancer, hypercalcemia, Ca125

Tumor markers are substances found in tissue, blood, or bone marrow that may be a sign of cancer or certain benign conditions. They may be used with other tests to help diagnose cancer, give a likely prognosis, and demonstrate treatment response. A 56-year-old female patient with breast cancer (T1N0Mx) underwent quadrantectomy with sentinel lymph node biopsy and adjuvant anthracycline based chemotherapy. Afterwards, radiation and endocrine therapy with letrozole were started. After two years of adjuvant endocrine therapy, the patient was admitted to the hospital due to hypercalcemia (Ca=4.43). Diagnostic work-up revealed bone marrow infiltration, pancytopenia and extremely high levels of serum tumor markers (Ca125=10989; Ca15-3=40.4; Ca19-9=214; CEA=19.10). Numerous osteolytic bone lesions and pelvic free fluid were found. Since Ca125 is customarily high in non-mucinous ovarian, endometrial and colon cancers, a different primary tumor was suspected. A gynecological ultrasound didn't indicate any pathological masses on the ovaries, and gastroscopy was also normal. Bone biopsy confirmed that it was hormone receptor positive Her2 negative breast cancer metastasis. Correspondingly, first line treatment with fulvestrant and palbociclib was initiated. After only three cycles of therapy, on regular check-up, good response was confirmed, and serum tumor markers dropped dramatically (Ca125=3653; CEA=6.8). Tumor metastases can often increase several different tumor markers, which sometimes correlate with different carcinomas. Although some markers are proven to have a good specificity for some tumors, that isn't always the case. Because of their lack of sensitivity additional tests should be performed to confirm metastatic disease and primary tumor origin.

CR43

Extracranial - intracranial bypass surgery in a patient with recurrent transient ischemic attacks

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Keywords: Extracranial - intracranial bypass, transient ischemic attack, end-to-side anastomosis

Extracranial – intracranial (EC-IC) bypass may help restore blood flow and reduce the risk of stroke in conditions such as Moyamoya disease, cerebral aneurysm, and skull base tumor, but its application for the prevention of ischemic stroke in stenooclusive carotid artery disease is still controversial. Careful selection of the patients at risk for stroke who can benefit from EC-IC bypass is mandatory. A 66-year-old male patient came to our attention due to recurrent TIAs in the left hemisphere. Digital subtraction angiography (DSA) and computed tomography angiography confirmed sub-occlusive stenosis of the right internal carotid artery (ICA) with no collateral blood flow from the left carotid tree or the posterior circulation. During DSA with attempted stenting of the right ICA, the patient developed acute stroke, and MRI showed DWI restriction in the watershed zone, confirming intolerance to hypoperfusion. Carotid endarterectomy was considered, but it was rejected due to too high periprocedural risk. Despite optimal medical therapy, he continued experiencing TIAs. Afterward, a comprehensive workup was done. A significant reduction of the vascular reserve was confirmed by transcranial color doppler (TCD). His cognitive functions were as expected for his age. EC-IC bypass was performed, with end-to-side anastomosis with a frontal segment of the superficial temporal artery and a temporal segment of the middle cerebral artery. There was a significant improvement in the weakness of the left extremities. After four years of follow-up, the patient is doing well, and he is asymptomatic.

CR44

Metastatic recurrence of breast cancer after pregnancy in a 41-year old woman with prematurely terminated adjuvant endocrine therapy

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Keywords: Advanced breast cancer, pregnancy, endocrine therapy

Breast cancer may reoccur months or years after initial treatment as local recurrence or distant metastases. Possible risk factors for recurrence include node-positive disease, aggressive biology of the primary tumor, and incomplete and prematurely terminated adjuvant systemic treatment including adjuvant endocrine therapy. A 37-year-old woman presented with two tumors (ER-90%, PR-80%, Ki67- 53%, Her2 negative) in the right breast with metastases in the right axilla. The patient was treated with neoadjuvant anthracycline and taxane-based chemotherapy and goserelin. In March 2016, she underwent right breast lumpectomy and axillary clearance followed by adjuvant radiotherapy. The patient was on endocrine therapy with tamoxifen and goserelin until February 2018, when she deliberately stopped treatment prematurely to plan a pregnancy. In January 2019, at 14 weeks pregnant, a significant increase in serum tumor marker Ca15-3 was observed. The patient failed to show up at the next appointment. Six months later, postpartum she developed dyspnea. Further investigation revealed a left pleural effusion, osteolytic bone metastases, and a recurrence in the right breast and axilla. She received zoledronate, ribociclib, and letrozole as first-line treatment for metastatic hormone receptor-positive, Her2 negative breast cancer. Three months later, serum tumor markers have dropped significantly, and a good response to therapy was confirmed. Current data from retrospective trials does not suggest an increased risk of breast cancer recurrence associated with pregnancy after stage-adjusted treatment. However, if therapy is terminated early the risk of metastases considerably increases. Patients must be advised to complete the full length of adjuvant treatment and attend all follow-ups.

CR45

Rituximab-associated progressive multifocal leukoencephalopathy with negative JC virus PCR from the CSF following treatment of follicular non-Hodgkin's lymphoma

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Keywords: rituximab, progressive multifocal leukoencephalopathy, follicular lymphoma, non-Hodgkin's lymphoma

Rituximab is a humanized chimeric anti-CD20 monoclonal-antibody used in the treatment of B-cell lymphoproliferative diseases. One of life-threatening complications that can develop during rituximab therapy is progressive-multifocal-leukoencephalopathy (PML), a rare, severe, demyelinating disease of the central-nervous-system that results from reactivation of latent John-Cunningham polyoma-virus (JCV). Here we report a case of a female patient who developed PML during rituximab maintenance therapy for relapsed follicular-lymphoma (FL). A 51-year-old female patient previously treated with two lines of immunochemotherapy (R-CHOP, R-Bendamustine) for FL and currently undergoing rituximab-maintenance in disease remission was hospitalized for development of a progressive lower-extremity weakness with radiologically described diffuse brain-lesions. She experienced progressive neurological-deterioration with development of tetraplegia, dysarthria, visual impairment and cognitive-function deterioration. The extensive diagnostic work-up (head MSCT and MRI, cerebrospinal-fluid (CSF) examination, stereotactic-brain-biopsy) excluded lymphoproliferative brain-disease. According to the anamnestic-data, diagnostic procedures and the clinical-course of the disease, patient probably developed PML although presence of JC virus could not been proven in repeated CSF sampling. Despite all the measures taken (corticosteroids, plasmapheresis, intravenous-immunoglobulins) clinical status further worsened leading to a fatal outcome. As with other immunosuppressants, the main concern with rituximab are infections. One of the diagnostic criteria for PML is the evidence of JC virus in CSF. Our case is intended to indicate a diagnostic limitation when proving JC virus in CSF. Despite our patient having repeatedly negative PCR tests for CSF on the JC virus, very progressive neurological damage, typical radiological findings and ultimately brain biopsy findings showed that this was most likely PML.

CR46

Comorbidity of Wilson's Disease mutation (H1069Q) with PAI-1 mutation in non-identical twins

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Keywords:Wilson's disease, non-identical twins, PAI-1 mutation

Wilson's disease (WD) or hepatolenticular degeneration is a rare autosomal recessive hereditary disorder of copper metabolism characterized by its accumulation in liver, brain and other tissues. In this case report, we showed two non-identical twins with comorbidity of WD with ATP7B – H1069Q mutation and congenital PAI-1 mutation to point out the importance of genetic testing and multidisciplinary access to these problems. First patient (now age of 48) presented at the age of 39 when she was referred to hepatologist because of hepatic lesion signs. Genetic testing was positive and she was diagnosed with WD, so therapy with penicillamine was introduced. Furthermore, her non-identical twin sister was called up for genetic testing which confirmed the same diagnosis and a therapy with zinc acetate was recommended. At the age of 40, physical examination of first sister showed postural, flapping tremor of both hands, increased muscle tone type rigidity and minimal dysarthria. Brain MRi showed parietal atrophy and frontoparietal hyperintense zones. Second sister had milder symptoms, just a discreet postural tremor of both hands. Both sisters are under the continuous therapy and monitoring of hepatologist and neurologist – movement disorder subspecialist. This case shows that genetic testing of relatives has a big importance in screening and diagnosis both of WD and PAI-1 deficiency and therefore allows earlier start of the treatment. Also, in diseases like WD multidisciplinary approach which includes hepatologist, neurologist, psychiatrist, molecular biologist and all others are „gold standard" to diagnose and treat these rare condition of metabolic deficiency.

CR47

Primary eosinophilic central nervous system vasculitis: case report

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Keywords: primary eosinophilic CNS vasculitis, cognitive impairment, hypereosinophilia, DSA, immunosuppression

Eosinophilic vasculitis is a characteristic of certain rheumatic diseases, but an isolated CNS form is very uncommon. We report of a male patient who was initially admitted to the outpatient Neurology clinic at the age of 52, due to cognitive difficulties and speech disturbances, accompanied by fatigue. Neurological examination revealed mild dysarthria and discrete spastic paresis of the right hand. Initial MRI presented posttraumatic left frontal lobe haemathoma and multiple microangiopathic lesions. There was mild serum hypereosinophilia (1170/mm3) with elevated protein level in cerebrospinal fluid (0.87 g/L). Digital subtraction angiography (DSA) revealed multiple non - significant intracerebral vessel stenoses concordant to CNS vasculitis. Patient was treated with pulse corticosteroid therapy, followed by 6-month cyclophosphamide treatment, with clinical and laboratory improvement. About two years after initial presentation he developed bilateral thigh muscle weakness, preceded by subfebrile temperatures and skin eczema. There was marked serum hypereosinophilia of 1400/mm3. Biopsy of right quadriceps muscle and sural nerve revealed inflammatory perivascular reaction adjacent to nerve trunk, as well as inflammatory myopathy. Control brain MRI three years after the onset of symptoms showed no new lesions. Control eosinophil count was normal at 480/mm3. Patient is clinically stable, with minimal cognitive impairment, and remains regularly monitored by neurologist and immunologist. Due to various and non-specific neurological manifestations as well as variable specificity and sensitivity of laboratory and imaging diagnostic methods primary CNS vasculitis is a challenging diagnosis. Since numerous conditions present as CNS vasculitis, with some not treatable with immunossuppressants, correct diagnosis is of great importance.

CR48

Extracorporeal membrane oxygenation (ECMO) in a patient who suffered cardiac arrest due to myocardial infarction: Case report

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Keywords: Cardiac arrest, Extracorporeal membrane oxygenation, Percutaneous coronary Intervention

Cardiac arrest is seen in approximately 3-10% patients with myocardial infarction with mortality from 30- 50%. Hemodynamically unstable patients have higher clinical risk of cardiac arest during percutaneous coronary intervention (PCI). That is why they may need ECMO support. ECMO is a modified form of cardiopulmonal bypass used as a temporary support for patients with cardiac and/or respiratory failure. Aim of this case is to present the role of ECMO in patient who suffered cardiac arrest. 50-year-old male patient, was admitted to the general practitioner's office due to chest pain, nausea and sweating. The initial electrocardiogram showed inferior ST segment elevation myocardial infarction. Patient was immidiately transferred to the Emergency departament (ED). During transportation, the patient suffered sudden cardiac arrest due to ventricular fibrillation. Cardiopulmonary resuscitation (CPR) started immediately, with several defibrilations being performed. Upon the arrival to the hospital, the patient was conscious with palpable central and peripheral pulse. Soon after, he suffered cardiac arrest once again with episodes of ventricular fibrillation and ventricular tachycardia followed by asystole. CPR was initiated with return of spontaneous circulation after 15 minutes. The peripheral ECMO system implantation was initiated and the patient was transported to the catherization laboratory for primary PCI with implantation of two drug eluting stents in the right coronary artery (RCA). This case report shows the importance of ECMO in emergency situations such as cardiac arrest and its support during PCI. It is also shown how ECMO can help reduce mortality risk and improve recovery.

CR49
A rare cause of oxalate nephropathy: a case report

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Keywords: Oxalate nephropathy, secondary hyperoxaluria, vitamin C

Oxalate nephropathy is a rare disorder in which the function of the kidneys is compromised by the accumulation of calcium oxalate crystals in the renal tubules. The intratubular deposits cause inflammation, which leads to acute kidney injury and progressive renal failure. There are various causes of oxalate nephropathy, such as enteric hyperoxaluria, primary hereditary hyperoxaluria, an oxalate-rich diet or high doses of vitamin C. Case report: A 33-year-old male patient presented with a sudden onset of severe uncontrollable vomiting, copious diarrhea and a temperature of 37.8C, following a large high-fat meal. The patient reported pre-existing arterial hypertension. He was hospitalized for acute kidney damage following laboratory results of proteinuria, hematuria, and calcium oxalate crystals present in his urine. Upon admission, his creatinine levels were 267umol/L, which rose to a maximum of 657umol/L after three days. His urea rose from 7.2mmol/L upon admission, to 19mmol/L. The patient exhibited metabolic acidosis. His potassium levels and urination remained normal. A renal biopsy was performed, which showed moderate acute tubular damage with intratubular oxalate deposits. The suspected cause were vitamin C supplements taken daily for several months within the recommended dosage. The patient was started on dialysis and began showing signs of recovering renal function. Conclusion: Oxalate nephropathy can be caused by certain dietary habits such as taking vitamin C supplements or consuming an oxalate-rich diet. Although rare, this case illustrates the importance of considering the dietary causes of acute kidney injury and taking a detailed dietary history.

CR50
Refractory irritable bowel syndrome and depression – severe disturbance of gut-brain axis

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Keywords: brain, depression, gut, IBS, constipation

Irritable bowel syndrome (IBS) is a common gastrointestinal disorder presented with a variety of symptoms, most commonly abdominal pain, constipation and diarrhoea. Diagnosis is made according to the Rome IV criteria. A 44-years-old female patient was diagnosed with depressive disorder in 2013. The patient also complained of several gastrointestinal problems such as abdominal pain, constipation and bloating. Initially, patient underwent work-up for IBS according to guidelines (FBC, thyroid function, tissue transglutaminase antibodies, calprotectin) and results were normal. In 2015, due to appearance of alarming symptoms (anemia, weight loss, hepatic lesion) work-up was expanded to immunological tests, gastroscopy, colonoscopy, and liver biopsy. Celiac disease, non-celiac gluten sensitivity, food allergy, Wilson disease, primary biliary cholangitis and autoimmune hepatitis were excluded. No other reason than IBS, anorexia and depression could explain her symptoms. In 2017 her symptoms worsened and she lost 10 kg in a period of two months. Last two years, psychiatric treatment and nutritional support was intensified but bloating is still the main abdominal symptom instead of applying all standard IBS therapeutic modalities. The multifactorial etiology of both IBS and depression precludes an unique therapeutic approach to these patients.Treatment of IBS-constipation is especially demanding in depressive patients and treatment is scarce. Last few years, research in the field of gut-brain axis and its bidirectional communication has been focused on gut microbes (which can produce most of the neurotransmitters found in the human brain) and bacterial translocation leading to activation of the hypothalamic-pituitary-adrenal axis which is inherent to the pathophysiology of depression.

CR51
Methoxyflurane in acute pain management

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Keywords: methoxyflurane, emergency medicine, inhalation analgesia

Methoxyflurane is a volatile inhalational analgesic that provides rapid short-term analgesia using a portable hand-held inhaler device and may provide an effective non-narcotic option for the emergency relief of moderate-to-severe pain associated with trauma in concious adult patients in the prehospital and emergency department setting. Methoxyflurane is self-administered by patient, has a rapid onset of action, its effects are quickly reversed and there are no reported drug interactions at analgesic doses. These characteristics make methoxyflurane suitable for use as a sole agent, or as a bridging agent to other analgesia. One inhaler provides 25-30 minutes of analgesia with cotinuous inhalation, or approximately 1 hour of analgesia under intermittent inhalation conditions. In this paper, we present the emergency medical service intervention of a 55 year old female that was injured as pedestrian in road traffic accident. Upon arrival the patient was conscious, oriented and contactable, her vital signs were stabile. In initial trauma assesment, anterior shoulder dislocation and fracture of humerus were identified. Pain scores were taken using the 10-point numeric pain scale. The results show a significant improvement in patient pain scores at 1, 2 and 5 minutes following administration of methoxyflurane. With its use increasing in prehospital care, methoxyflurane is recognised as a useful adjunct to the choice of analgesia for trauma patients with moderate to severe pain. Low-dose methoxyflurane analgesia has a well-established safety profile: no respiratory depression or clinically significant effects on vital signs have been reported and adverse events are usually transient and self-limiting.

CR52
Bickerstaff brainstem encephalitis: A case report

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Keywords: anti-ganglioside antibody, Bickerstaff brainstem encephalitis, plasmapheresis

Background Bickerstaff's Brainstem Encephalitis (BBE) is a rare neurological condition clinically manifested in acute ophthalmoplegia, ataxia, lower limb areflexia, consciousness disturbances. The etiopathogenesis is unclear, but anti-ganglioside autoantibodies suggest autoimmune mechanism. Case presentation A 44-year-old man presented with dysarthria, dysphagia and bulbomotorics disorders. Few hours later, patient started feeling tingles in hands and feet. This was followed by rapid deterioration of bulbomotorics, phonation, dysphagia, diaphoresis, hypersalivation and craniocaudal symmetric muscle weakness. Soon the patient was comatose, tetraplegic with absent brainstem reflexes, yet normal cerebral blood flow and normal EEG. The patient was intubated and mechanically ventilated. Cerebrospinal fluid examination revealed normal protein levels and mild pleocytosis. Therapeutic plasma exchange (TPE) was started due to suspicion of BBE. The diagnosis was confirmed by detection of high anti-GQ1b antibody serum titer. No infection neither tumour process was proven. The patient was treated with 7 courses of TPE, pulse dose glucocorticoids and intravenous immunoglobulin. The recovery was slow and complicated by heterotopic ossifications formed in elbows, knees and hip which were surgically removed. After 12 months the patient recovered completely his cognitive functions, achieved independent mobility, but still had bilateral peroneal paresis and hypoesthesia in left forearm. Conclusion BBE is an autoimmune disease of the central and peripheral nervous system which is frequently associated with acute infection or tumour. We have presented an idiopathic severe case which was successfully treated with immunosuppressive and immunomodulatory treatment.

CR53

Systemic juvenile idiopathic arthritis without arthritis as the cause of intermittent persistent fever in a 7-year old girl

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Keywords: Systemic JIA, Juvenile idiopathic arthritis, intermittent fever

Intermittent fever along with increased inflammatory markers (CRP and ESR) most commonly is the sign of an infectious disease. Nevertheless, without an adequate response to antibiotic treatment, it should raise concern of other conditions, including several rheumatic, like Kawasaki disease, periodic fever syndromes and systemic form of juvenile idiopathic arthritis (JIA), even when no clear arthritis is present.We present a case of a 7-year-old girl with a 14-month history of intermittent fever with increased inflammatory markers, along with unspecific symptoms such as hepatomegaly, polymorphous rash and migratory arthralgia. An extensive diagnostic workup excluded infectious aetiology, genetic testing did not detect pathogenic mutations, while bone marrow biopsy showed no signs of malignancy. Despite the treatment with IVIGs and low dose glucocorticoids (GCs), the fever did not subside. Finally, extensive laboratory workup revealed increased proinflammatory cytokines IL-6 and TNF-alpha along with chronic anaemia and thrombocytosis. The systemic subtype of JIA was considered, and treatment with pulse (30mg/kg), continued with high (2mg/kg) doses of GCs was initiated with an instant resolution of symptoms. Nevertheless, after the weaning of GCs, the new exacerbation was observed and therefore tocilizumab, humanized monoclonal antibody against IL-6 receptor, was initiated. The recognition of the unique nature of systemic JIA in comparison to other types of JIA as well as an increased understanding of its pathogenesis, provides a better outcome and prognosis for children who often go undiagnosed with a debilitating chronic condition.

CR54

Faecal calprotectin as a non-invasive biomarker of gut inflammation in a girl with arthritis

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Keywords: juvenile idiopathic arthritis, inflammatory bowel disease, faecal calprotectin

Various forms of arthritis in children and adults are frequently associated with the inflammation in additional extraarticular sites. In order to uncover the possible inflammation of the gut in those patients, non-invasive tests such as faecal calprotectin (FC) can be employed prior to more aggressive procedures. We present a case of a 16-year-old girl with symptoms suggestive of inflammatory bowel disease. She was diagnosed with an unspecified form of juvenile idiopathic arthritis at the age of 9, and during the course of the disease, both knees, ankles, elbows and small joints of hands and feet were affected. The laboratory workup excluded the presence of B27 antigen and on multiple occasions showed negative RF and anti-CCP, with positive ANA and selective IgA deficiency. Despite intermittent low back pain, MRI was not suggestive for sacroiliitis. She was treated with various NSAIDs and intraarticular joint injections without the need for other treatment modalities. Due to the weight loss with intermittent abdominal cramps, the measurement of FC was performed, which revealed increased values of 838 mg/kg. The stool microbial screening and anti-gliadin antibodies were negative. The ileocolonoscopy showed no macroscopic abnormalities, while microscopic findings revealed mucosal flattening and diffuse lymphocytic infiltration. While FC is increasingly used as a diagnostic and/or prognostic biomarker in inflammatory bowel disease, its value in the detection of gut inflammation in patients with arthritis is still largely unknown. Therefore, our case adds to the growing evidence supporting the usefulness of FC in discovering subclinical gut inflammation.

CR55
Idiopathic retroperitoneal fibrosis diagnosed on MSCT scan

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Keywords: diagnosis, idiopathic, MSCT, retroperitoneal fibrosis

Idiopathic retroperitoneal fibrosis (RPF) is a rare fibro-inflammatory disease that develops around the abdominal aorta and the iliac arteries. Men are affected twice to three times more often than women and the mean age at presentation is 50–60 years. A 58-year old male patient presented with pain in the upper right quadrant that radiates to the lower back. He is a smoker and a long-term ketoprofen user, had cholelithiasis and a previous abdominal surgery, which are described in literature as risk factors for the development of idiopathic RPF. MSCT scan showed fibrotic retroperitoneal mass spreading around the aorta, vena cava and both ureters from kidney hilum all the way caudally along iliac arteries. This is a typical location for idiopathic RPF. Raised concentrations of acute phase reactants, such as C-reactive protein, can help to substantiate the diagnosis. When the mass shows atypical localizations, e.g. peripancreatic or pelvic, or when other clinical, laboratory and imaging findings suggest the presence of underlying malignancy or infection, biopsy is performed. However, in this case, CT scan was sufficient for the diagnosis and the patient was started on Decortin and Methotrexate treatment. The most important differential diagnosis is retroperitoneal lymphoma or sarcoma. Metastases from various types of carcinomas, tuberculosis and pelvic actinomycosis should also be considered. Idiopathic RPF is associated with autoimmune diseases and should be viewed as a systemic condition. Corticosteroids and immunosuppressants are used for treatment with good results but optimum dose and duration of therapy are not well established.

CR56
A girl with Turner syndrome and multiple autoimmune disorders

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Keywords: Turner syndrome, Type 1 diabetes mellitus, hyperthyroidism, autoimmunity

Turner syndrome (TS) is condition which occurs due to the complete or partial deficiency of the X chromosome, exclusively in females. It is characterized by short stature, wide neck, low-set ears, hearing loss, kidney anomalies, heart defects, ovarian insufficiency and infertility. Girls with TS are prone to develop autoimmune conditions such as autoimmune thyroiditis, coeliac disease, type 1 diabetes (T1D), psoriasis, etc. We present a girl diagnosed with T1D at the age of 13 months, receiving subcutaneous insulin since. Due to short stature and specific clinical features, at the age of three years karyotyping was performed and confirmed TS (45, XO). Further evaluation led to diagnosis of coeliac disease requiring gluten-free diet and autoimmune thyroiditis with normal thyroid function. At the age of 11.7 years she developed clinical signs of hyperthyroidism (weight loss, hair loss, nervousness and irritability). Laboratory results (suppressed TSH and elevated T4 with normal TRAb) indicated that hyperthyroidism was developed based on autoimmune thyroiditis. The therapy with the thiamazole and propranolol was initiated and treated according to laboratory results. During three years of follow-up she remained euthyroid. Although TS is associated with increased incidence of autoimmune diseases, patients with TS and T1D are rather rare. Autoimmune thyroiditis is the most common associated condition; however, hyperthyroidism develops infrequently, and exceptionally after more than eight years follow-up. Presented case confirms mentioned association between TS and developing multiple autoimmune disorders and emphasize the need for screening for autoimmune conditions in order to provide timely diagnosis and treatment.

CR57

Sporadic pheochromocytoma in young adult presenting with adrenergic crisis

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Keywords: pheochromocytoma, adrenergic crisis, hypertension

Pheochromocytoma is catecholamine- secreting tumor that originates from adrenal medulla. This rare tumor occurs in less than 0.2% of patients with hypertension. Classic triad of symptoms: palpitations, headache and excessive sweating is usually not present. Case summary: We present a case of a 33 -year old man, with a history of hypertension in the past three months. Initial therapy was a combination of perindopril/indapamide/amlodipine. He presented in the ED with hypertensive episode, and was prescribed bisoprolol and moxonidine in addition to other therapy. Nine days later he presented in the ED with excessive oscillations in BP (140/90 -180/110 mmHg), pulsating occipital headache, nausea, excessive sweating, occasional palpitations without chest pain. MSCT has shown solid expansive process of the left adrenal gland, with significant post contrast imbibition (ddx. pheochromocytoma). Upon admission to ICU he manifested an adrenergic crisis with rapid exchange of BP 320/180 - 70/40 mmHg. Urine metanephrine levels were 237.9 umol/dU and urine normetanephrines were 165.8 umol/dU. Upon BP stabilisation phenoxybenzamine and propranolol were started 20 days preoperatively. Laparoscopic left sided adrenalectomy was performed. Pathohistological findings verified that adrenal mass was indeed pheochromocytoma. PASS was 12/20, which implies a more aggressive biologic behavior of a tumor. Postoperative levels of 24-hour urine metanephrine and normetanephrine urine were normal. Genetic testing for MEN-2 was negative. Next biochemical reevaluation is scheduled in 6 months. Conclusion: Pheochromocytoma should be suspected in cases of the classic triad, hyperadrenergic spells, early onset or resistant hypertension, positive family history of MEN2, VHL, NF1 syndrome.

CR58

Concomitant occurrence of acquired hemophilia and severe form of bullous pemphigoid - a case report

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Keywords: Acquired hemophilia, bullous pemphigoid, rituximab

Acquired hemophilia A (AHA) is an autoimmune disorder characterized by antibodies against coagulation factors, most commonly factor (F) VIII, which occurs in patients without positive family history. Bullous pemphigoid (BP) is also an autoimmune disease, characterized by subepidermal blistering and autoantibodies directed against the hemidesmosomal components BP180 and BP230. We report a case of a 68-year-old female who presented with generalized erythema and multiple clear bullae, which subsequently became hemorrhagic, followed by large skin hematomas and bleeding into the mouth. The diagnostic workup revealed very low factor (F) VIII levels, and positive antibodies towards FVIII of 43.5 Bethesda units (BU). Initial treatment with cyclophosphamide and corticosteroids failed to achieve remission, even more, the level of inhibitors rose to 86,2 BU. Hemorrhagic complications were successfully managed by FEIBA. Screening for an underlying malignant or autoimmune disease was negative. However, olanzapine, which the patient was taking due to depressive disorder, was ceased, as it was considered as a possible cause of AHA. Moreover, rituximab at a dose of 475 mg/m2 once weekly was administered as a second line therapy. Only after the third dose of rituximab, the levels of FVIII started to rise and inhibitors decline. Besides, skin bullae disappeared and skin hematomas resolved. AHA and BP are autoimmune diseases that may occur as the first manifestation of unrecognized underlying disease or condition. We postulate that olanzapine might have induced two autoimmune diseases in this patient. Remission of both diseases was achieved by rituximab and cessation of suspected drug.

CR59
Neurosyphilis

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Keywords: Syphilis, HIV, paraplegic

Tertiary or late syphilis may occur many years after the primary infection. However, it appears in only one third of untreated patients, and a few treated ones. Neurosyphilis is one of the clinical manifestations in this stage. Our patient is a 28-year-old man with a history of risky behaviour. He was infected by HIV and syphilis, primary ulcer. Despite penicillin and symptomatic therapy, he started to experience severe headaches, concentration and memory loss, visual impairment, muscle weakness, urinary incontinence, paraesthesia, and soon he became paraplegic. Meningitis was diagnosed, Argyll-Robertson pupil and facial nerve central paralysis were found. Cerebral atrophy was shown in an MRI. He was diagnosed with an advanced neurosyphilis. Despite 30 days benzylpenicillin treatment and a slight improvement in his general condition, the prognosis was very poor. His parents were extremely persistent, exercising with him daily, and obedient to the advice of all the doctors involved in his treatment. As a result, he started to move his legs in August 2019 and shortly afterwards was able to walk with his fathers help. Paraesthesia, facial nerve palsy, dysarthria as well as some other symptoms persist, but his condition is much better than expected. Neurosyphilis is a rare manifestation of syphilis. Since most of the symptoms are non-specific, the diagnose is based on anamnesis, neurological deficits, serological tests, lumbar puncture and an MRI. The first line of treatment is parenteral penicillin. As this case report shows, concurrent infection with HIV can extremely accelerate appearance of the tertiary stage of syphillis.

CR60
Comprehensive eye evaluation in myopia is needed to prevent insidious visual loss

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Keywords: myopia, retinal tear, laser photocoagulation

More than half of nontraumatic rhegmatogenous retinal detachments (RRD) develop in myopic eyes. This case report highlights the importance of regular comprehensive eye examination in myopic patients and presents risk factors for RRD and further management in order to prevent devastating visual loss. A 30- year-old female with low myopia (objective retinoscopy -2.50 D) was scheduled for a regular eye exam. The patient revealed no history of trauma neither intraocular surgery. Ultra-wide field retinal imaging (Optos California icg) demonstrated at 11 o'clock near ora serrata large retinal tear on right eye and lattice lesion on the left eye. Although asymptomatic, prophylactic laser photocoagulation treatment of the tear was performed due to family history positive for RRD in a first degree relative. Posterior vitreous detachment, retinal breaks, lattice degeneration and myopia are major precursors to RRD. Low myopia (1 – 3 D) poses fourfold risk for RRD compared to emmetropia. The risk for RRD further increases if family history is positive. Treating vitreoretinal abnormalities reduces the rate of subsequent RRD and thus prevents devastating visual loss. All patients with myopia should be advised to perform ophthalmological exam. Follow up and re-evaluation is dependent on the type of the lesion and accompanying risk factors.

CR61
Minimally invasive lateral unicompartmental knee replacement: Case report of a patient treated with the Oxford fixed lateral prosthesis

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Keywords: lateral unicompartmental knee arthroplasty, fixed bearing, lateral osteoarthritis

Isolated lateral unicompartmental femorotibial osteoarthritis (OA) is not very frequent condition, appearing only in about 1/8 of all cases. In advanced stages of the disease, surgical options include total knee replacement (TKR) or unicompartmental knee replacement (UKR). UKR has many advantages over standard TKA, such as possibility to use minimally invasive approach (without dislocating patella), shorter surgical time, less bleeding, faster patient recovery and better postoperative range of motion (ROM). Here we present a case of patient suffering from isolated lateral OA, treated with the Oxford fixed bearing lateral prosthesis. ROM, visual analogue scale (VAS) and Knee injury and Osteoarthritis Outcome Score (KOOS) was recorded preoperatively and 3 months postoperatively. Reported patient is 57 year old female social worker with isolated, lateral tibiofemoral osteoarthritis of her left knee. The anterior cruciate ligament (ACL) as well as the medial and lateral collateral ligaments were functionally intact, the valgus deformity was manually correctable and there was no evidence of osteoarthritis in the medial and patellofemoral compartment. The procedure was performed through minimally invasive surgical (MIS) technique using a small parapatellar lateral approach without dislocation of the patella. There was no notable blood loss or other complications. Full weight-bearing was allowed postoperatively. At 3 months follow-up the postoperative scores significantly improved when compared to the preoperative status, ROM reached preoperative values, and the patient was very satisfied with the procedure. Lateral Oxford UKR using a fixed-bearing device is a safe and effective surgical option in isolated femorotibial osteoarthritis of the lateral compartment.

CR62
Complex treatment of a patient with Churg-Strauss syndrome

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Keywords: Churg-Strauss syndrome, immunosuppression, neuropathy

Churg-Strauss syndrome or eosinophilic granulomatosis with polyangiitis(EGPA) belongs to a group of autoimmune vasculitides of the small blood vessels.EGPA can present with a variety of symptoms, which vary from mild to life threatening. Etiology is still uncertain and is most likely a combination of genetic and environmental factors, that trigger overactive immune system response, causing widespread inflammation. 51-year old patient with a severe case of EGPA, complicated with mononeuritis multiplex and very complex treatment, was diagnosed with bronchial asthma in 2011 and 4 years after was admitted to General Hospital Varaždin (facial swelling, fever, dyspnea and paresthesia). Bloodwork showed high eosinophil count(Eo53%,9060Eo/μL), and CT scan showed lung infiltrates, so the patient was transferred to University Hospital for Lung diseases(UHLD), with suspected diagnosis of EGPA. After confirmation, steroid and cyclophosphamide with mesna therapy was administered. Control MR showed regression of all infiltrates, but paralysis remained and she was referred to physiatrist. In July 2016, after 7th dose of cyclophosphamide the patient experienced severe vomiting and nausea prompting change in therapy to azatiophrine with continuation of steroids. In September 2016 the patient was admitted to UHLD due to severe pancytopenia. Genotypization showed deficiency of thiopurine methyltransferase, causing myelosuppression. Azathioprine was discontinued and after professor Zwerina from Vienna Hanusch hospital was consulted, methotrexate immunosuppression therapy was recommended with reduction of steroids. The patient is currently in remission and is regularly monitored. This case shows the potential for immense complexity in treating a single patient due to enzyme deficiency and possible drug side effects.

CR63

Diagnosing testicular adrenal rest tumors in an adult patient with unrecognized congenital adrenal hyperplasia

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Keywords: bilateral testicular tumors, congenital adrenal hyperplasia, testicular adrenal rest tumor

In patients with congenital adrenal hyperplasia (CAH), testicular adrenal rest tumors (TARTs) can occasionally be found. They develop from adrenal precursor cells that have descended into the scrotum along with the testes and retained their adrenocorticotropin (ACTH) responsiveness. A 49-year-old patient presented with enlarged testes, reporting experiencing abdominal pain, weight loss and pain in the left testicle for a month. During his first year of life, he was referred to an endocrinologist due to salt wasting, but no official diagnosis was made. He didn't have children and was shorter than his brother and father. Ultrasonography and multislice computed tomography(MSCT) were indicative of bilateral tumors of the testes. Tumor marker levels were normal. Abdominal MSCT revealed solid tumors with necrotic parts in the left retroperitoenal area (22x15x18x12 cm) and right suprarenal gland (4,6x8,5 cm). Left orchidectomy was performed. In pathohistological analysis the tumor was classified as a TART. Blood testing revealed elevated 17-hydroxyprogesterone(17-OHP) (836 nmol/L), ACTH(23,1 pmol/L) and progesterone(171nmol/L) levels. CAH due to 21-hydroxylase deficiency was diagnosed. Daily treatment with 0,75 mg of dexamethasone was initiated. After five months tests showed normal levels of 17-OHP(6,8 nmol/L), ACTH(1,6 pmol/L) and progesterone (20,2nmol/L). Testosterone undecanoate therapy was initiated. Dimensions of suprarenal tumors were slightly altered: 20x15x19x12 cm on the left and 5,7x3,6x2,9 cm on the right. This case report shows how a seemingly difficult condition was put under control with simple therapy, once CAH was diagnosed. It's important to keep this disorder in mind beacause it can often be overlooked in male patients.

CR64

Positive effects of intranasal oxytocin and oral Caralluma Fimbriata on the reduction of hyperphagia in a patient with Prader-Willi syndrome

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KEYWORDS: oxytocin, Caralluma Fimbriata, hyperphagia, Prader-Willi syndrome

INTRODUCTION/OBJECTIVES: Prader-Willi syndrome is a severe genomic imprinting disorder for which no effective treatment has been discovered so far. Recent studies have shown that oxytocin may play a significant role in appetite suppression and weight control in patients with Prader-Willi syndrome. CASE PRESENTATION: We present a 19 years old female patient with a microdeletion type of PraderWilli syndrome diagnosed at the age of 3 years. Since then, she developed uncontrolled and morbid obesity with poor and questionable prognosis, metabolic syndrome, arterial hypertension, insulin resistance, glucose intolerance, dyslipidemia, etc. Growth hormone was never introduced, nor was the diet well regulated. After only two months of therapy with intranasal oxytocin 4 IU taken every morning and 500 mg of Caralluma Fimbriata taken orally twice daily, BMI was decreased from 44.1 kg/m2 to 42 kg/m2. In addition to 5 kg reduction in body mass, a psychoemotional improvement was noticed through a structured hyperphagia questionnaire and an interview with both the patient and her mother. The improvement was evident from body mass reduction, decreased food-related fixation and anger, improved food-related behavior such as a reduction in food intake, and overall mood improvement. No side effects were reported so far. CONCLUSION: Our short-term results with intranasal oxytocin and oral Caralluma Fimbriata therapy showed a beneficial effect on hyperphagia symptoms and morbid obesity in a previously poorly regulated patient with Prader-Willi syndrome.

CR65

Latent Epstein-Barr infection as a probable contributory factor for hepatic lesion in immunosuppressed patient with ulcerative colitis

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Keywords: Epstein-Barr virus, ulcerative colitis, hepatic lesion, immunosuppression, biological therapy

Epstein Barr virus (EBV) is a member of the Herpesviridae familiy and proven causative agent of infectious mononucleosis. In the era of biological therapy, there is increasing awareness regarding latent EBV reactivation during immunosuppression. It is challenging to attribute the risk of reactivation to biological therapy or to the underlying disease. 23 year old male patient experiencing bowel problems since 2008, was diagnosed with ulcerative pancolitis in 2013. Mesalazine and corticosteroid therapy did not achieve remission. Due to normal tiopurinmethyltransferase enzyme activity, azathioprine (4x50 mg) pharmacotherapy was initiated. Soon patient developed severe and prolonged toxic hepatitis requiring hospitalization. Opportunistic infections screening recorded positive EBV IgM with no detectable EBV viremia. In agreement with his infectologist, treatment with infliximab (5 mg/kg) was started. After fourth infliximab infusion, patient developed severe liver lesion that required discontinuation of biological therapy. Imaging and biochemical parameters were negative for parenchymal liver disease, in vitro immunological findings of autoimmune hepatitis, PBC or PSC were negative, MRCP finding was negative for bile ducts lesions. Tests for cytomegalovirus, hepatitis B, herpes simplex or drug reactions were negative. Vedolizumab therapy was started with good clinical outcome and no signs of liver lesion. Due to not fully defined cause of liver lesions, we assume that in this case, during the period of immunosuppression, patient developed slight EBV viremia which was the main cause for liver lesion. Early recognition of EBV infection and treatment with reduced immunosuppression and acyclovir therapy has the potential of preventing such complications.

CR66

Late onset grand-mal epilepsy in elderly patient

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Keywords: cerebrovascular diseases, tonic-clonic convulsions, late onset grand-mal epilepsy, elderly patient

Epilepsy is the third most common neurological condition in elderly, subsequent to dementia and stroke. New onset epilepsy has the highest incidence in elderly and due to that fact, epilepsy should be considered as an important public health problem. The most common causes of epilepsy in elderly are cerebrovascular diseases. Arterial hypertension and hyperlipidemia additionally highly increase the risk of epilepsy in elderly. 86- year old female patient was brought to the emergency room after she lost consciousness for a few minutes and had tonic-clonic convulsions. She is mobile, responsive and without any pain. Patient was previously diagnosed with arterial hypertension and vascular dementia. On admission, all vital signs were stable, the patient was conscious but without any verbal contact. Sphincter control was retained and a bite mark was found on the tongue. Lung and heart examination did not show any abnormalities. Complete blood count showed slight anemia. EEG showed diffuse changes in the left temporal region. MSCT of the brain did not show any signs of ischemia nor hemorrhage, but parenchymal atrophic changes were seen in cerebrum and cerebellum. In conclusion, the patient was diagnosed with new onset grand-mal epilepsy and was treated with methylphenobarbital 100 mg (Phmiton). During hospitalization, there were no additional seizures. Due to new onset of epilepsy and already known diagnosis of dementia, it was explained to her family that she would require constant care and regular supervision of her family medicine doctor.

CR67
Implementation of continuous ambulatory peritoneal dialysis (CAPD) in chronic renal insufficiency

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Keywords: chronic renal insufficiency, cryoglobulinemic glomerulopathy, continuous ambulatory peritoneal dialysis

Chronic renal insufficiency (RI) is described as gradual loss of kidney function. It is often a serious consequence of various glomerulonephropathies. 24-year old female was admitted to the nephrology department for education about continuous ambulatory peritoneal dialysis (CAPD). In 2011, atrophic left kidney of unknown etiology was found, together with compensatory hypertrophic right kidney. No evidence of renal artery stenosis nor obstructive uropathy. In 2016, the patient was hospitalized due to nephrotic syndrome (24-h proteinuria-7 g, leg pitting edema), acute RI, hyperkalemia, RR 220/150 mmHg and retinal hemorrhage. Elevated LDH levels, normocytic anemia and thrombocytopenia raised suspicions of malignant hypertension due to thrombotic microangiopathy. Renal biopsy verified changes consistent with cryoglobulinemic glomerulopathy (thickening of arterioles - hyaline thrombus, IF microscopy IgM 3+) with progressive chronic changes. At the time, the patient received pulse corticosteroid therapy with 20% albumin and diuretic, leading to extraction of 7L of interstitial fluid and complete regression of leg edema. After hospitalization, patient has been undergoing regular check-ups. Due to progression of RI to end stage kidney disease (urea 36, creatinine 730, ph 7,29, BE-8), hemodialysis was indicated. Due to her age, she was advised a switch to peritoneal dialysis and in 2018 patient was implanted with a peritoneal catheter. After her education, she was discharged home with instructed continuation of pharmacotherapy: CAPD 4x 24 h (2x1,5% Glucose + 2x2,3% Glucose), diet change (less Ca, K) peroral - Valsartan 160 mg 1,0,1 tbl., Ebrantil 60,60,90 mg., Physiotens 0,2+0+0,4 mg. Nephrological check up if needed.

CR68
Taussing-Bing syndrome

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Keywords: double outlet right ventricle, subpulmonary ventricular septal defect, cardiac surgery

The Taussing-Bing syndrome is a cyanotic congenital heart defect characterised by double outlet right ventricle (DORV) and subpulmonary ventricular septal defect (VSD) along with transposition of the great arteries. Treatment is surgical and the results are excellent. A 14-day old patient with complex heart defects was admitted to the pediatric cardiology department due to invasive cardiac treatment: a total correction of Taussing-Bing anomaly. The patient was presented with tachypnea and perioral cyanosis, dominantly seen while crying. Clinical examination reveals systolic murmur, audibility 3/6. Heart ultrasound shows aorta exiting from right ventricle, side-by-side to the pulmonary artery, which rides above VSD. Also ultrasound reveals an atrial septal defect (ASD). CT-angiography of the thorax confirmed the ultrasound diagnosed defects, additionally revealing coronary arteries anomaly. An X-ray of the thorax showed an enlarged heart shadow. The patient undergo cardiac surgery in which VSD was closed using a biointegral patch from bovine pericardium. Then, in order to make arterial switch, a Janet operation was performed. ASD was closed using surgical stitches. The patient's postoperative state was good. In order to prevent volume loading of the heart, the patient continues with diuretics and antihypertensive therapy. The Taussing-Bing anomaly is the second most common form of DORV, just after Fallot tetralogy. If the defect is not treated surgically, the patient's prognosis is bad. Therefore, it is important to recognize and diagnose this anomaly early enough in order to make total correction surgery, which will enable patient to develop and grow normally.

CR69
Severe sclerotic chronic Graft-versus-Host Disease – multidisciplinary approach

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Keywords: Allogeneic stem cell transplantation, chronic GvHD, multidisciplinary approach

Allogeneic haematopoietic stem cell transplantation (alloHSCT) is a life saving procedure for many malignant and non-malignant haematological disease. Chronic Graft-versus-Host Disease (cGvHD) is a major late complication of alloHSCT. As it is a multisystemic disease, it can affect several organ systems: skin, eyes, mouth, gastrointestinal tract, liver, joints/fascia, genitourinary tract and lungs. In this case report we present a patient with severe sclerotic cGVHD. A 38 year old women was diagnosed with essential thrombocitaemia in 1994 and was treated with hydroxyurea and later with anagrelide. In 2012., her condition progressed to secondary myelofibrosis, requiring alloHSCT that was performed on October 12th. At +45 days, analysis of peripheral chimerism proved secondary graft rejection with 100% of recipient cells. Another alloHSCT was done on December 31st. She developed acute liver and skin GvHD (grade IV) on +20 day, treated with extracorporeal photopheresis and triple immunosuppressive therapy. On +464 day, signs of skin, mouth and eyes cGvHD appeared – livid-eritematous egzantema on her back and presternal region, darker pigmentation of visceral area of skin, bucal mucosa erosion, pseudomembranes and striae lichenoideae in oral cavity and dry eyes with pain and keratoconjunctivitis sicca. Her treatment was guided by numerous specialists: stomatologists – Caphosol, Gelclaire, dermatologists – tacrolimus, PUVA, ophtalmologists – Ikervis drops, physiotherapists, endocrinologists, neurologists, immunologists along with haematologists with severe lines of systemic treatment: cyclosporine, Imatinib, Mycophenolate mofetil and Medrol. CGvHD is a major late complication after alloHSCT, affecting multiple organ systems and requiring multidisciplinary approach.

CR70
Identifying imminent visual loss after unremarkable eye trauma

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Keywords: blow-out fracture, orbital compartment syndrome, orbital emphysema

Blow-out fracture is commonly caused by blunt trauma with objects larger than the orbital aperture. The transmitted raised intraorbital pressure causes fracture of the orbital walls leaving intact orbital margins and displacing bone fragments outside the orbit. Knowledge of this clinical entity and its rapid management can prevent both sight- and life-threatening complications. A 52-year-old male patient got poked in the right eye accidentally with a finger of a baby. After nose blowing he observed massively swollen lids and epistaxis. At presentation, mild inferior lid bruising, subconjunctival haemorrhage with marked periorbital emphysema were disclosed. No signs of external ophthalmoplegia could be elicited. Right eye visual acuity declined to 0.5 logMAR with positive relative afferent pupillary defect (RAPD). MSCT defined right blow-out orbital roof and floor fracture with orbital emphysema. The patient was immediately referred to the department of oral and maxillofacial surgery to maximize chances for visual recovery. Systemic antibiotics were prescribed to prevent orbital cellulitis. RAPD and visual acuity decline evidence for severe optic nerve damage aggravated by compressive orbital emphysema. Orbital compartment syndrome caused by emphysema is a sight-threatening emergency. Muscle, connective tissue or orbital fat entrapment within the fracture manifest with diplopia and enophthalmos in severe cases. Presence of cerebrospinal fluid leakage and oculovagal reflex declare life-threatening injury. Regardless of severity, in all patients with trauma history one should suspect life- and vision-threatening disorders when orbital emphysema is present.

CR71

Bell's palsy in a breast carcinoma patient undergoing chemotherapy

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Keywords: Bell's palsy, House-Brackmann scale, facial muscle paralysis, corticosteroids

Facial nerve palsy (Bell's palsy) is an acute idiopathic condition affecting innervation of the 7th cranial nerve, causing weakness and paralysis of facial muscles. Nerve inflammation can be ascribed in some cases to immune or viral origin with compression causing subsequent ischemia and paresis. House- Brackmann scale can be used as a quick tool for grading the extent and severity of the condition. 56-year old female patient was referred to a neurologist with complaints of left sided facial musculature weakness and asymmetry. In June, 2019 she was diagnosed with left breast carcinoma with left axillary metastasis and the decision was to initate a protocol of neoadjuvant chemotherapy with paclitaxel 150mg infusion (4+12w scheme) followed by scheduled surgical resection. In January,2020 patient complained of intense left otalgia, for which she was referred to an ORL (otorhinolaryngology) specialist. Symptoms of left sided otalgia persisted, together with a new onset left sided facial numbness and vertigo. ORL status showed no signs of internal or external auditory pathology. Neurological status showed weakness of the left frontalis muscle (weaker forehead creasing), asymmetry of left labial commissure and weakness of left orbicularis oculi (weaker blinking). She was diagnosed with peripheral lesion of the left facial nerve, House- Brackmann II (slight dysfunction and asymmetry, 75-95 % normal function). Prescribed therapy was Medrol tbl. 80mg with gradual decrease to 4mg + Controloc 40mg and facial mimic exercises. Pathophysiological changes influenced by patient's previous medical condition and treatment with chemotherapy could be described as a potential trigger for facial nerve paresis.

CR72

Challenges of extragonadal germ cell tumor – importance of multidisciplinary team

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Keywords: extragonadal germ cell tumor, multidisciplinary team, ultrasound imaging

Germ cell tumors are the most common types of cancer in young men. Most patients can be treated either surgically and/or with chemotherapy and rarely with radiotherapy. This case report aims to highlight the importance of multidisciplinary team approach in the extragonadal nonseminomatous germ cell tumors (EGNSGCT). A 20-year-old male was admitted with prolonged lumbar pain. MSCT showed tumour formation in the left hemiabdomen and multiple lung metastases. The patient was diagnosed with EGNSGCT without histological verification. Very high levels of AFP, βHCG and LDH indicated low survival rate. After seven cycles of chemotherapy, residual tumour mass was removed. Lung metastases were reduced in size. 3 months after the therapy βHCG increased significantly. The left testicular ultrasound showed inhomogeneous mass. Unnecessary radical left orchiectomy was performed since pathohistology report was negative. Also, brain MRI showed new metastases which was indication for radiotherapy and high-dose chemotherapy with peripheral-blood stem-cell rescue. Tumor markers returned to normal values without any signs of relapse. There are currently no verified guidelines for treatment of EGNSGCT. Every patient should undergo high frequency testicular ultrasound imaging. If βHCG levels are high, brain MRI must be performed to look for metastases. Multidisciplinary team should discuss diagnostic and therapeutic procedures for each patient to avoid the risk of medical errors related to misinterpretation.

CR73
Leukocytoclastic allergic vasculitis

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Keywords: Hypersensitivity, vasculitis, punch biopsy

Leukocytoclastic allergic vasculitis(LCV), also known as ″hypersensitivity vasculitis″, is a histopathologic diagnosis given to cutaneous, small vessel vasculitis, specifically a vasculitis of the dermal post-capillary venules. The inflammatory infiltrate is composed of neutrophils that undergo degeneration (leukocytoclasis) and karyorrhexis (nuclear dust), with apparent fibrinoid necrosis of the vessel walls around the vasculature together with the extravasation of red blood cells in the dermis. Key clinical features include palpable purpura, lower extremity location, small vessel involvement, and extracutaneous involvement in approximately 30% of patients. A 54-year old patient presented with painful ulcerations on the lower leg, which started as hemorrhagic papules one-month before admission. The ulcerations were clear shallow permeated with granulation and partial fibrin tissue with exudation of clear discharge. A punch biopsy led to a diagnosis of leukocytoclastic allergic vasculitis due to previous treatment with sulfonamide. Treatment consisted of antimicrobial honey bandages applied every second day. After three weeks, the pain was decreased, there was a clear sign of granulation and the beginning of epithelization without erythema on the surrounding skin. Due to the good response to treatment, there was no need for additional corticosteroid treatment. LCV is idiopathic in 50% of patients with infections and drugs being the most common triggering factors. A punch biopsy is the most crucial diagnostic step for the confirmation of the disease, followed by treatment with antimicrobial honey bandages and corticosteroids if the patient does not show proper response with bandages alone.

CR74
Localised form of granulomatosis with polyangiitis in young adult

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Keywords: cANCA, Wegener's granulomatosis, granulomatosis with polyangiitis

Granulomatosis with polyangiitis (GPA) also known as Wegener's granulomatosis is one of the three antineutrophil cytoplasmic antibody (ANCA)- associated vasculitides (AAV). It usually affects the upper respiratory tract, lungs and kidneys and presents with necrotising granulomas, necrotising or granulomatous vasculitis (of medium and small vessels) and necrotising glomerulonephritis. We present a case of a 26 year- old male with a history of a genital form of lichen sclerosus from a young age. The patient's father also suffers from genital type of LS and sarcoidosis. In 2018 the patient suffered from nose congestion, frequent epistaxis and pain in nose projection, and was treated with local nasal decongestants and antibiotics for 3 months. With exacerbation of existing symptoms, gradual hearing loss occurred. Otorhinolaryngologist recommended CT scan of paranasal sinuses and biopsy of nasal mucous membrane which showed granulomatous inflammation and necrosis. Quantiferon test came negative, there were no signs of kidney involvement, cANCA titer was positive, and PR3-ANCA was >200 RU/ml therefore clinical immunologist sets diagnosis of a localised form of GPA. Patient was treated with methylprednisolone and methotrexate with significant remission of symptoms. During evaluation of the disease bronchoscopy showed tracheal subglottic granuloma and rituximab and trimethoprim/sulfamethoxazole were added to therapy. Patient is regularly monitored by an immunologist and pulmonologist. GPA may be presented with non-specific nose related symptoms. As this case report shows, it should be suspected in patients with autoimmune family anamnesis and confirmed by laboratory investigation, CT scan and biopsy.

CR75
PCSK9 inhibitors- promising new treatment option for chronic kidney disease patients with refractory dyslipidemia

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Keywords: PCSK9 inhibitors, Nephrotic syndrome, Refractory dyslipidemia, Chronic kidney disease

Cardiovascular (CV) risk in chronic kidney disease (CKD) patients is several-fold higher than the risk of end-stage-renal disease. Renal dyslipidemia which is already present in early stages of CKD significantly accelerates atherosclerosis. It is recommended that patients with CKD are considered to be at high or very high CV risk having the same LDL-cholesterol targets as other very high risk CV patients. Pathophysiology of dyslipidemia in nephrotic syndrome (NS) is more complex associated with increased synthesis of PCSK9 which promotes LDL-receptor degradation and makes treatment of dyslipidemia more difficult. It was shown that PCSK9 inhibitors (PCSK9i) on top of background statin therapy decrease LDL cholesterol by more than 50% and significantly reduce CV endpoints without adverse events. Data on effect of PCSK9i in patients with NS are scarce. We are presenting a 35 year old obese men with focal segmental sclerosis and NS who was resistant to several lines of immunosuppressive therapy. During the seven years of follow up values of his LDL cholesterol oscillated between 3.7 and 6.2 mmol/l despite use of statin in maximal tolerate dose. After evolocumab, a PCSK9i, was added to rosuvastatin 10 mg significant decrease of LDL cholesterol was observed reaching the LDL level of 1.09 mmol/l after 4 months of therapy. According to our knowledge this is the second case report of successful treatment of a patient with a refractory NS with PCSK9i. These findings point on PCSK9i as new promising therapy for CKD patients with refractory dyslipidemia and very high CV risk.

CR76
Pauci-Immune Glomerulonephritis

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Keywords: glomerulopathies, hypertension, renoprotective antihypertensive drugs, ambulatory blood pressure, therapeutic algorithm

We are presenting clinical course of a patient with pauci-immune glomerulonephritis and uncontrolled hypertension. Men born in 1959 referred to our nephrology clinic because of unregulated blood pressure (BP), hyperuricemia and eGFR 38 ml/min/1,73m2. At age of 30 increased serum uric acid and serum creatinine values were recorded for the first time. In 2005 hypertension was diagnosed, but antihypertensive therapy was not introduced. From 2007 to 2012 he was treated in another nephrology clinic where diagnosis of pauci-immune glomerulonephritis with advanced chronic changes was established after kidney biopsy in 2007. He was treated with various immunosuppressive drugs (steroid and cyclophosphamide boluses, steroid and azathioprine per os) and his eGFR remained unchanged (arround 35 ml/min/1,73m2.) In 07/2018 he came to our clinic; eGFR 38 ml/min/1,73m2, 24h proteinuria 0,5 g. Office and average BP on ambulatory BP monitoring were 206/120 mmHg and 158/106 mmHg, respectively – uncontrolled hypertension with white coat effect (WCE) was confirmed. Antihypertensive therapy was adjusted, statin and febuxostat were introduced. In 10/2018 his BP was controlled (ABPM 130/85 mmHg) but WCE was present (168/102 mmHg), with eGFR of 40 ml/min/1,73m2, normal serum uric acid and improved LDL cholesterol values. Beside being treated with immunosuppressive drugs patients with various types of glomerulopathies should be treated with renoprotecitve antihypertensive drugs and statins. It should be underlined that deterioration of kidney function is not only renal but also cardiovascular risk factor. Because of high prevalence of WCE, ABPM must be part of diagnostic and therapeutic algorithm.

CR77

The first Croatian child with genetically confirmed Pyridoxine - Dependent Epilepsy (PDE) - an atypical scenario

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Keywords: vitamin B6 dependent epilepsy, hypoplastic corpus callosum, neurodevelopmental delay, status epilepticus

PDE is a rare autosomal recessive disorder characterized by intractable seizures within the first weeks of life, refractory to antiepileptic drugs (AED) but responds both clinically and electrographically to large doses of pyridoxine. Clinical diagnosis may be made in children experiencing status epilepticus or repetitive clinical seizures by concurrently administering 100 mg of pyridoxine intravenously while monitoring the EEG and SaO2. PDE: may coexist with hypoxic-ischemic encephalopathy, can cause intellectual disability, and may often remain undiagnosed. PDE is treatable, thus early diagnosis is crucial treatment. We present a girl who developed generalized cyanosis, tonic seizures, mixed acidosis 10 hours after birth, was life-threatened and mechanically ventilated. EEG showed focus without paroxysms. Seizures were pyridoxine-unresponsive but responsive to AED. Brain MR showed hypoplastic corpus callosum and atrophy of deep white matter and hippocampus, respectively. She was severely developmentally delayed. Hypoxic-ischemic encephalopathy was suspected until further analysis showed an elevated concentration of α-aminoadipic semialdehyde (α-AASA) in urine and identified a biallelic pathogenic mutation in ALDH7A1 gene encoding alpha-aminoadipic semialdehyde dehydrogenase. We introduced daily pyridoxine in high doses 30 mg/kg/day/orally and later on started with "triple therapy" (pyridoxine, lysine restriction, L-arginine supplementation). Seizures were stopped, disability remained. The patient presented with atypical seizures that both initially respond to AED and then become intractable and with atypical seizures that during early life didn't respond to pyridoxine but several months later were well controlled with pyridoxine. Our goal is to raise awareness of atypical cases where early diagnosis is important for a more favorable prognosis.

CR78

Delayed leukoencephalopathy with optic neuritis after endovascular coiling of a cerebral aneurysm

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Keywords: delayed leukoencephalopathy, coiling, embolization, aneurysm, optic neuritis

Delayed leukoencephalopathy is a rare complication that can occur after endovascular coiling of cerebral aneurysms. Possible etiologies include foreign body emboli, contrast-induced encephalopathy, or hypersensitivity reaction to foreign bodies. It usually presents as headache or hemiparesis. A 72-year-old woman was successfully treated by coil embolization and stenting for a large aneurysm of the righ internal carotid artery (ACI). Two months later she was re-hospitalized due to weakness in the left leg, quickly followed by weakness in the left arm. Multi slice computed tomography (MSCT) revealed a hypodense lesion in the white matter of the right parietal lobe, initially interpreted as an ischemic lesion. Subsequent magnetic resonance imaging (MRI) revealed an oval-shaped demyelinating lesion in the parietal white matter. Corticosteroid therapy slightly reduced motoric symptoms, after which the patient was referred to a rehabilitation center, where she almost completely recovered. A year later she developed gradual vision loss in the left eye and narrowed visual field in the right eye. Repeated MRI revealed edematous and thickened optic chiasm, predominantly on the left side, with hyperintensity of the prechiasmatic and intracanalicular segments of the left optic nerve, consistent with optic neuritis. The patient was treated with a pulse corticosteroid therapy, which slightly reduced her symptoms. Although delayed leukoencephalopathy is a very rare complication of coiling and stenting of intracranial aneurysms and clinical course is typically benign, clinicians need to be aware of possible occurrence.

CR79

Severe eye pain induced by physical activity in a healthy young man – expect glaucoma!

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Keywords: pigmentary glaucoma, sport, myopia

Pigment dispersion syndrome (PDS) and pigmentary glaucoma (PG) represent a spectrum of the same disease characterized by excessive pigment liberation throughout the anterior segment of the eye. PDS/PG is primarily a disease of young myopic males. Patients with acute glaucoma usually present with severe pain in the eye, nausea and vomiting. A 20-year-old low-myopic male was referred to University Eye Clinic after ophthalmological examination with the diagnosis of ocular hypertension. Intraocular pressure (IOP) as measured by applanation tonometry was 15 mmHg in the right eye and 35 mmHg in the left eye. History revealed the patient was suffering from severe eye pain and blurry vision after sport activity. Transillumination defects of the iris, marked pigmentation of trabecular meshwork and Krukenberg spindle on corneal endothelium defined PDS. Optic nerve demonstrated no glaucomatous damage. Prostaglandin drops were introduced. PDS presents with unique clinical patterns and should be considered in differential diagnosis of eye pain in otherwise healthy young myopic athletes. Risk of conversion to PG is up to 50%. The degree of pigmentation correlates with the severity of glaucomatous tissue damage. Treatment of the disease is challenging. Laser peripheral iridotomy can reduce irido-zonular friction and thus pigment dispersion, however does not retard visual field loss. If IOP cannot be adequately managed, surgery is indicated. Vigilant follow-up of PDS/PG patients is mandatory.

CR80

Primary sclerosing cholangitis - a challenging indication for liver transplantation

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Keywords: PSC, UC, liver transplantation

Introduction: Primary sclerosing cholangitis (PSC) is a rare immune-mediated liver disease in which inflammation and fibrosis lead to multifocal biliary strictures. The hallmark of the disease is its association with inflammatory bowel disease (IBD). Disease progression is inevitable in most patients and liver transplantation (LT) may present the only curative treatment option. The case: A 36-year-old female was diagnosed with PSC and ulcerative colitis (UC) in 2008. The treatment with urodeoxycholic acid and mesalazin was initiated, however due to deterioration of her liver function, she underwent LT in 2013. Her immunosuppression consisted of tacrolimus, mycophenolate mophetil and steroid taper. Her post-transplant period was unremarkable until 5 years later, when abnormal liver tests indicated an extensive work-up including MRCP and biopsy, confirming PSC recurrence. Since then she has experienced several episodes of acute cholangitis controlled by antibiotics, with the progression of primary disease confirmed by MRCP. A colonoscopy revealed an active UC. The patient has been re-listed and shortly after re-transplanted, without the recurrence of PSC in the follow-up. Conclusion: PSC is a challenging entity, given its predominance in younger population, association with other diseases and the lack of efficacious treatment methods. LT may provide a cure, however the long-term follow-up is burdened with more challenges than in other LT recipients: concomitant IBD and disease recurrence. Treatment options after LT are limited, and re-LT may be considered as a long-term option. However, the benefits of graft explantation should be weighed against the risks of re-LT.

CR81
CASE REPORT: Recurrent melanoma diagnosis reached with the help of dermoscopy

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Keywords: recurrent melanoma, face, dermoscopy

We present a recurrent melanocytic lesion in an older patient in whom dermoscopy played a critical role in reaching the correct diagnosis of recurrent melanoma. Original pathologic slides for reviewing the original diagnosis of junctional nevus were not available. An 86-year-old female patient was examined due to the recurrence of pigmentation on the left wing of the nose. Four years ago, a newly appeared pigmented lesion on the nose was excised. Pathohistological report of the given lesion was a junctional nevus. At the time of examination, clinically light brown pigmentation measuring 6x5 mm beyond the old white scar outlines was observed. Further dermoscopy showed asymmetrical structureless light brown pigmentation which intermingled with follicular openings transversing the scar's edge, putting in question the initial diagnosis of junctional nevus. With high levels of clinical suspicion that this recurrent lesion on the nose is a recurrent melanoma, as well as finding one more highly suspicious macular lesion on the right cheek to be an early melanoma, excisions were prompted. Pathohistological reports of both lesions were melanoma in situ. Re-excision was done with a surgical safety margin of 4 mm to lower the recurrence rate. This is an example of valuable clinicopathologic correlation and collaboration of the dermatologist and the pathologist. Histologically, lentigo maligna or melanoma in situ can display very subtle features and may be easily overlooked in chronically solar damaged skin with reactive melanocytic hyperplasia. Among dermoscopic features of this recurrent melanoma, pigment transversing the scar's edge was the key feature.

CR82
ST-elevation myocardial infarction (STEMI) in a 22 years old male after alcohol and cocaine intoxication

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Keywords: STEMI, cocaine, alcohol

Acute myocardial infarction usually occurs due to coronary plaque rupture and consequent coronary occlusion but may also occur following cocaine use. Cocaine affects the cardiovascular system through either increased sympathetic output or a local anesthetic effect. Increased sympathetic tone and catecholamine levels lead to increased blood pressure (BP), myocardial contractility, and increased heart rate (HR), all of which increase myocardial oxygen demand. Simultaneously, cocaine decreases oxygen supply via coronary vasoconstriction, which can lead to ischemia or infarction. The anesthetic effect affects myocytes by blocking Na+ channels, causing contractility decrease in the left ventricle and arrhythmias. A 22-year old male patient with STEMI arrived via ambulance at the University Hospital Centre Zagreb emergency department. After a night of binge drinking and cocaine consumption, the patient suffered chest pain, left arm tingling, and syncope. At the arrival, he was conscious, contactable, afebrile, sweaty, with dilated pupils. BP was 105/65mmHg, HR 77/min, and SpO2 98%. Heart and lung auscultation showed no pathology. Electrocardiograph showed sinus rhythm with a 77/min frequency, physiological electrical axis, and ST-elevation of 3mm V1-V3. He received nitroglycerine and aspirin before being sent to the percutaneous coronary intervention, which showed decreased blood flow in the left anterior descending artery, without occlusion. Lab results showed increased ethanol and cocaine concentrations, while troponin levels remained normal throughout hospitalization. Later, he was admitted and monitored in the intensive care unit. In the next two years, he was admitted seven more times with similar symptoms and cocaine intoxication. The important long-term interventions are psychological help, entering a substance abuse program, and education on the harmful effects of cocaine and alcohol.

CR83

Intracranial hemangiopericytoma – can patients be safe from tumor recurrence?

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Keywords: solitary fibrous tumor/hemangiopericytoma, metastases, radiotherapy, surgical resection

Solitary fibrous tumor/hemangiopericytoma (SFT/HPC) is an extremely rare mesenchymal tumor which arises from pericytes surrounding blood vessels, mostly in central nervous system. The treatment combines total resection with adjuvant radiotherapy with good results, however SFT/HPC tends to recur and develop distant metastases many years after surgical resection. In 2012 a 47-year old man presented with frontal headache, vision loss and changes in behavior and personality. Neuroradiological imaging showed a 7 cm expansive tumor in the left frontal lobe and the patient underwent total surgical resection. Histological analysis revealed grade III SFT/HPC with >10 mitosis per 10 high-power fields, proliferative activity Ki67 15%; CD99 and CD34-positive, EMA-negative. The patient received adjuvant radiotherapy (60Gy/30x). For the next 8 years he was closely monitored with no signs of relapse on magnetic resonance, with unremarkable neurological status, except for partial but stable vision loss on both eyes. In 2020 an isoechogenic node (10 cm) was detected in the right liver lobe by ultrasound. MSCT showed a hypervascular lesion with central necrosis. Based on the histological similarity with the primary tumor, the lesion was confirmed to be a metastasis and the patient has been scheduled for liver resection. Due to rapid progression of high-grade SFT/HPC, early diagnosis and adequate treatment significantly improve patient outcomes. However, local and metastatic recurrence may occur years later despite the aggressive approach. Therefore, regular follow-up is strongly advised, as well as further studies which will help in defining the most effective treatment standard.

CR84

Case report: multidisciplinary approach to a patient suffering from tetraparesis as a result of autoimune enchephalitis and multiple cerebral venous thrombosis

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Keywords: rehabilitation, tetraparesis, autoimmune encephalitis, cerebral venous thrombosis

A 29 year old patient with a history of seronegative spondyloarthropathy (HLA B27+), was initially hospitalized for a consciousness disorders and febrility. She developed enchepalitis amd cerebral vein thrombosis (CVT) which resulted with tetraparesis, loss of sphincter control and cognitive impairment. She has done the cerebrospinal fluid analysis (CSF) which objectified the inflammatory process. MRI has proved the suspicion of autoimmune enchepalitis. MR venography has verified deep vein thrombosis. She was tracheotomized and mechanically ventilated for 14 days because of respiratory insufficiency. Due to the lack of effect of the initial antibiotic and antiviral therapy, immunosuppressive therapy with pulse doses of glucocorticoids and cyclosphospamide was initiated. The patient was immobile, incontinent, and fed through nasogastric tube. She had hypotrophic musculature of dominant lower extremities with symmetrically weakend muscle strength of all extremities. Neuropsycological testing revealed a two month retrograde amnesia, reduced verbal fluency and impaired concentration. Intensive rehabilitation for a total of 16 weeks consisted of an individual medical gymnastics, electrostimulation of hypotrophic musculature, occupational therapy and speech therapy. Immunosuppressive treatment was continued and she had received a total of three doses of cyclophosphamide. At the end of rehabilitation, she was independent in all activities of daily living. Functional independent measurement

(FIM) at discharge was 101/126, sphincter control and independent gait with normal speed was established. Cognitive function and voice quality were improved. Tetraparesis is a serious complication of encephalitis and CVT. This case shows the essence of physical therapy especially in terms of mobility and gaining muscle strength.

CR85
Multidisciplinary treatment of the malignant middle cerebral artery infarction – A CASE REPORT

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Keywords :middle cerebral artery, malignant infarction, decompressive hemicraniectomy

Malignant middle cerebral artery (MCA) infarction develops in individuals with poor collateral circulation. Extensive edema causes an increase in intracranial pressure (ICP) and herniation of brain tissue resulting in up to 80% mortality. Decompressive hemicraniectomy (DHC) significantly increases survival probability. The key issue in the decision regarding DHC is when to preform it. With hastily intervention, we might unnecessary treat those whose ICP will not later increase significantly. In case of belated DHC, initially non-infarcted parenchyma will be affected, leading to a greater neurological deficit. Today's criteria suggests DHC within 48h of the stroke onset. We report a 57-year-old male patient presented with headache and rapidly progressing left-sided hemiparesis. An emergency CT verified stroke in the area of right MCA.
Edema progression was confirmed with daily control CT scans, but the patient's neurological status remained unchanged for the first 5 days. Then, the patient became somnolent and the motor deficit progressed to left-sided hemiplegia. CT revealed extensive edema, a shift of the brain masses across the medial line and the development of subfalcine and uncal herniation. Although the current guidelines suggest against performing DHC after 48h, due to TCD confirmation of low resistance flow in the left MCA ,DHC was performed. Gradually, neurological status improved and the patient was released with cognitive functions intact and residual severe left-sided hemiparesis. An individualized, multidisciplinary approach to this patient has enabled the identification of candidate for DHC even after a 48h period, thus making the patient completely functioning and capable for work today.

CR86
Henoch Schönlein purpura – IgA vasculitis – a case report

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Keywords: Henoch – Schönlein – purpura, IgA nephropathy, chronic kidney insufficiency

Henoch Schönlein purpura is an autoimmune disease of hypersensitivity reaction type III occurring mostly in children, especially males. It is a vasculitis caused by IgA antibodies and C3 complement and classified in the group of microscopic vasculitides small blood vessels. It may also affect the kidneys and causes IgA nephropathy. A 50 years old male patient came to department of infectious diseases in the hospital of Varaždin and complained about pain in his extremities, general weakness and skin changes, which were in a red rash fashion resembling red points (purpura). There he was diagnosed with nephrotic syndrome and erythrocyturia. In the Nephrology ward in KB Dubrava, where they performed kidney biopsies and immunofluorescence, the glomeruli were positive for IgA, lambda and kappa chains, IgM and IgG, especially at the peripheral renal capillaries, the tubular cylinders and the tubular epithelium. The tubular basal membrane and the intima of the blood vessels were positive for C3. The patient was diagnosed in KB Dubrava with Henoch – Schönlein purpura and IgA nephropathy, chronic kidney insufficiency and arterial hypertension. The patient was discharged home with Methylprednisolone as mean immunosuppressive treatment for IgA vasculitis and IgA nephropathy. This report should emphasize, though Henoch – Schönlein purpura as a rarity, it is still one of the causes of Berger's disease and occurred in this case in a relatively older patient.

CR87

Poor outcome of twin anemia polycythemia sequence: case report

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Keywords: twin anemia polycythemia sequence, monochorionic twins, neonatal anemia, polycythemia, twin-twin transfusion syndrome

Twin anemia polycythemia sequence (TAPS) is a form of twin-twin transfusion syndrome, affecting about 6% of all monochorionic twin pregnancies. It usually occurs in the late second or third trimester. Arteriovenous vascular anastomoses lead to anemia in one twin, and polycythemia in the other. Imbalanced intertwin circulation causes severe discrepancy in hemoglobin levels, leading to considerable morbidity and mortality rates of affected neonates. Male low birth weight twins were born at 35th week of gestation, to 29-year-old primigravida via an emergency cesarean section due to pathological cardiotocography finding in the second fetus. During birth, the second twin suffered severe neonatal asphyxia. Following resuscitation, intubation, and venous umbilical catheter placement, he was admitted to the neonatal intensive care unit. Blood tests revealed hypochromic anemia and metabolic acidosis. He was continuously monitored, mechanically ventilated and administered blood transfusions. Cerebral function monitoring confirmed hypoxic-ischemic encephalopathy. Cardiac ultrasound revealed signs of pulmonary hypertension. Mixed type acidosis developed. Despite current intensive care measures, general condition deteriorated, and multiorgan system failure developed leading to death in 67th hour of life. The first twin was diagnosed with mildly symptomatic polycythemia that led to hyperbilirubinemia, successfully treated via continuous phototherapy and was released home in a good condition. Although rare, TAPS is a considerable clinical issue and it is of paramount importance to recognize it as early as possible, preferably antenatal. Prenatal diagnosis, along with proper treatment will hopefully improve poor clinical outcomes.

CR88

The art of recognizing pain amplification syndrome in children

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Keywords: juvenile fibromyalgia, pain amplification syndrome, conversion disorder

Juvenile fibromyalgia is a pain amplification syndrome characterized by diffuse idiopathic musculoskeletal pain, usually affecting children older than 10 years. American College of Rheumatology criteria for diagnosis include absence of other disorder that could explain the pain, symptoms lasting for ≥ 3 months, widespread pain index (WPI) ≥ 7 and symptom severity score (SSS) ≥ 5 or WPI 3 – 6 and SSS ≥ 9. We present a case of 15-year-old girl with diffuse and persistent pain along with episodes of impaired consciousness. Episodes characterized by collapse and inability to move or speak for several minutes repeatedly occurred during the last 3 years. They were preceded by paraesthesia of face, arms and feet, but have never resulted in injury. The pain was most commonly felt in radiocarpal joints, hips, low back,groins and neck. The patient complained of extreme tiredness, poor sleeping and inability to concentrate. Brain MRI and EEG were normal. The rheumatologic evaluation revealed multiple painful points with WPI 9 and SSS 8. The patient didn't experience morning stiffness, joint swelling or fever. Extensive laboratory workup and MRI of sacroiliac joints and spine excluded the inflammatory aetiology. The psychological assessment revealed poor stress coping strategies. The patient was diagnosed with fibromyalgia and conversion disorder exhibited in the form of pseudoseizures. Physical therapy and psychotherapy were advised. Fibromyalgia and diverse psychological distress are causally related. Conversion symptoms are not uncommon. These issues are important to address, and a comprehensive treatment plan involving the entire family should be considered.

CR89
Case report: Therapeutic-hypothermia in cardiac arrest patient

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Keywords: cardiac arrest, hypothermia, recovery

INTRODUCTION: Therapeutic hypothermia as a method of lowering patients body temperature to hypothermic values has shown to improve neurological outcome in cardiac arrest patients. CASE PRESENTATION: Patient without significant medical history, went to the hospital due to chest pain. He experienced cardiac arrest nearby the hospital. BLS measures were given by the bystander and the resuscitation team came shortly. Initial rhythm was ventricular fibrillation (VF). Multiple DC shocks were delivered alongside IV amiodarone. Spontaneous circulation returned. However, he had repetitive VF which required continued ALS and multiple DC cardioversions. Rhythm was stabilized and the initial ECG displayed anterolateral STEMI. Unconscious, intubated, hemodynamically stable patient was transferred to the coronary care unit. Echocardiography displayed signs of hypertensive heart disease including decreased contractility in apical, lateral and anterior left ventricle. Ejection fraction was decreased to 25% -30%. Coronography detected acute occlusion of the proximal left anterior descending artery (LAD). Percutaneous Coronary Intervention (PCI) of LAD was performed successfully. After PCI, the patient was still comatose (GCS 4), therefore therapeutic-hypothermia (TH) was initiated using Thermoguard intravascular cooling-device. Furthermore, he developed severe pulmonary edema with the X -ray image of ARDS. High positive end-expiratory pressure ventilation and 100% oxygen were required along with diuretic therapy. TH with a target temperature of 24°C was maintained for 24 hours. After 10 days, the patient showed signs of gradual neurologic recovery and after 14 days fully regained consciousness. CONCLUSION: Our goal was to present a patient with cardiac- arrest and good outcome due to therapeutic- hypothermia.

CR90
Gastric adenocarcinoma complicated by postoperative septicemia

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Keywords: Adenocarcinoma, Septicemia, Surgical Oncology, Gastrectomy

Introduction: Gastric adenocarcinoma is a malignant epithelial tumor, originating from glandular epithelium of the gastric mucosa. Intestinal and diffuse type are two major histological types of gastric adenocarcinoma. Case report: A seventy-seven-year-old woman was admitted to the UHC Sestre milosrdnice after significant weight loss and back pain for six months. After complaining of food regurgitation without nausea or vomiting, she was treated in gastroenterology outpatient care for two weeks and was diagnosed with adenocarcinoma of the angular region of the stomach. Laboratory findings revealed microcytic anemia which was treated with a single dose of erythrocyte concentrate and ferric carboxymaltose (Ferinject 1000mg i.v.). CT showed a suspected lesion (7 mm) in the posterior segment of the inferior pulmonary lob, and several small lesions (up to 6 mm) of unknown etiology. She underwent gastrectomy and cholecystectomy, where perforation of the front wall of the stomach and infiltration of the left liver lobe were seen. The PHD revealed mixed pT4aN2 G2 adenocarcinoma. An early postoperative course was complicated by septicemia caused by C. koseri and Enterococcus spp., and was treated with amoxicillin sodium/clavulanic acid potassium (Klavocin 1000/200mg i.v.) three times a day and gentamicin sulfate (Gentamicin 120mg i.v.) two times a day. With no further complications, full enteral nutrition was resumed on postoperative day 6, and the patient was discharged 14 days after the operation. All postoperative controls were uneventful. Conclusion: We present a case of advanced malignant gastric adenocarcinoma complicated with postoperative septicemia. Multidisciplinary approach should be taken into account for all patients with oncological diseases.

CR91

Presentation of a patient with chronic low back pain and general symptoms

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Keywords: chronic back pain, Hodking lymphoma, general symptoms

Introduction/Objectives: A 22 year old patient was examinated due to sudden, lower back pain, stifness and general symptoms such as fever, fatigue and weight loss that were present for nine months. Case: The back pain devepoled only during the night at first. Morning stifness lasted up to 15 minutes, and was resistant to exercise or resting. Clinical examination detected pain in the right sacroiliac joint area and reduced mobilty of the lumbar spine. Laboratory findings showed elevated acute-phase reactants, microcytic anemia, and borderline thrombocytosis. A standard pelvic radiograph showed an erosion of the right sacroiliac joint. MR revealed an edema of the L1 vertebra and central sclerosis and periosteal reaction of the trunk of the same vertebra on MSCT. MR aslo showed extensive bone edema on the sacral and right iliac bone with corticalis destruction. The lymph nodes in the abdomen were enlarged. Hematological disease was suspected. CT scan showed enlarged lymph nodes in the neck area, mediastinum, lungs, and in the pelvis. Bone biopsy and histopathological diagnosis did not implicate a lymphoproliferative process. CT guided biopsy of the mediastinal lymph node and the histopathological analisys confirmed Classical Hodking lymphoma. PET / CT was performed to evaluate the disease prevalence, which showed a metabolically active disease in lymph nodes, lungs and bones, stage IVB. Hematologic treatment is ongoing. Conclusion: Chronic back pain with no clear etiology, demands a detailed diagnostic approach so the diagnosis and treatment can be preformed as early as possible.

CR92

Procalcitonin – a false alarm in osteogenesis imperfecta patients?

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Keywords: procalcitonin, osteogenesis imperfecta, traumatic injury

Procalcitonin is the prohormone for calcitonin with different biologic activities. It is a sensitive and specific parameter for predicting bacterial sepsis. We present a case of osteogenesis imperfecta (OI) patient after traumatic injury with unusually high procalcitonin levels. A 24-year-old male with OI type 2, was admitted from the Special Hospital for Chronic Diseases of Children in Gornja Bistra to emergency surgical department after falling out of a wheelchair. He had left frontal head and left arm trauma. CT verified a multifragmenting skull fracture with epidural hematoma and scapular fracture with displacement. An emergency evacuation of epidural hematoma and coagulation of diffuse bleeding from dura was performed. GCS was 15. His temperature was 38.5°C. In the next four days, leukocyte count decreased from 26 x10^9/L to 9x10^9/L, and CRP increased from 6 mg/L to 76 mg/L. Extremely high procalcitonin level of 13 ng/mL a day after surgery, decreased to 2 ng/mL in the next three days. Hemocultures and urine cultures did not detect microorganisms. Chest X-ray did not show any infiltrates, and abdominal ultrasound excluded biliary vesicle pathology. Four days after surgery, he was transferred to neurosurgical department, where he had no further complications. Procalcitonin levels usually increase slightly after traumatic injury, not to such excessive amounts as in our patient without sepsis. Procalcitonin in OI patients after traumatic injury seems to act as a false positive indicator for bacterial sepsis. Further studies should be carried out for confirmation.

CR93

Complex cardiovascular defects in a male infant with Williams syndrome juxtaposed with survey results illustrating other patients' experiences

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Keywords: Williams Syndrome, Small for gestational age, IUGR Prenatal Cardiology

INTRODUCTION/OBJECTIVES: Williams syndrome (WS) is a multisystemic disorder affecting connective tissue, as well as cardiovascular and central nervous systems. The main cause is a de novo hemizygous deletion of 1.5-1.8Mb on chromosome 7q11.23 encompassing the elastin gene. Cardiovascular abnormalities such as supravalvular aortic stenosis and pulmonary artery stenosis are observed in almost 80% of cases. To assess the prevalence and severity of cardiological problems in Polish patients with WS. CASE PRESENTATION: A thirty-four-year-old gravida 3, para 3 with Small for gestational age (SGA)/ intrauterine growth retardation (IUGR) suspicion in 30th week of gestation was referred to our Department. Examination performed at our Department in 30+6 week revealed: VSD, disproportion in the great vessels, and interrupted aortic arch. He was born in the 40th week. After a series of cardiological procedures he was discharged extremely late at the age of 277 days. Moreover, we analyzed surveys from a group of 18 families of (9 males). WS was diagnosed in median age of 13 months. The main reasons for genetic testing were dysmorphia (77.78%), cardiovascular problems (72.22%) and inappropriate weight gain/short stature (33.33%). The most common cardiovascular problems were pulmonary artery stenosis (61.11%) and aortic stenosis (38.89%). CONCLUSION: SGA and/or IUGR accompanied by cardiovascular defects were the main prenatal conditions in Williams syndrome. Cardiovascular problems in WS have a broader spectrum compared with so far described in the literature, usually benign and relatively late detected findings.

CR94

Prolactinoma causes infertility in men

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Keywords: infertility, prolactinoma, bromocriptine

Prolactinoma is one of the most common functional pituitary gland tumor. By causing hyperprolactinemia, it decreases levels of sex hormones in the blood. Considering these effects of prolactinoma, it is important not to oversee it in differential diagnosis of infertility in men and women. We report a case of a 29-year-old man who was admitted as part of the treatment for marital infertility. The patient complained about problems with erectile dysfunction. Prolactin levels were elevated (3571 mIU/L) and testosterone was low(8,53 nmol/L). Spermiogram showed oligoasthenoteratospermia. The international index of Erectile Function (IIEF) was 5,22. On urological examination testicels were shown smaller and softer accompanied with varicocele. NMR of the pituitary gland showed imbibition outburst of 8 mm. Prolactinoma was diagnosed. The patient was dismissed with bromocriptine therapy (Bromergon a 2,5 mg). One month after the treatment started bromergon test showed decline in prolactine value. Spermiogram was also normalised. New NMR did not show signs of microadenoma. The patient was taking Bromergon for two more years after the results of NMR were negative and prolactin levels were normalised. Another two years have passed until the prolactin levels were elevated again. Now the patient is being processed. In people with prolactinoma the goal is not only to normalise prolactin levels but also to reduce the size of tumor. Prolactinoma is treated with bromocriptine, which works both ways. Treatment is being cancelled two years after normalisation of results. However, because of possible reappearance of tumor, the patient has to be permanently controlled.

CR95

"Elfin face" as main clinical sign of a Williams Beuren syndrome: case report of two patients

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Keywords: Williams-Beuren syndrome, delayed psychomotor development, facial dysmorphia

INTRODUCTION/OBJECTIVES: Williams-Beuren syndrome (WBS) is a rare developmental disorder caused by a microdeletion 7q11.2. Most cases are sporadic, autosomal dominant inheritance is rare but possible. It is characterized by intellectual disability, distinctive facial features, congenital heart defects, and unique personality characteristics. CASE PRESENTATION: This case represents two children of healthy nonconsanguineous parents. First, the female child, born in the third pregnancy with birth weight (BW) 2780g, mild intrauterine growth restriction (IUGR), and Apgar score (AS) 10. Postnatal presenting with facial dysmorphia including hypertelorism, flat nasal bridge, anteverted nares, thin upper and full lower lip, spaced teeth, and high palate that can be described as "elfin face". A karyotype is normal. Fluorescent in situ hybridization (FISH) found microdeletion 7q11.2. The girl now has 22 months, delayed psychomotor development, hypothyroidism, and no other associated anomalies. Second, 7 years old girl, born in the first pregnancy by caesarean section, complicated by IUGR (oligohydramnios). BW 2220g, AS 10. An echocardiogram showed ventricular and atrial septal defects. Three months later, she was hospitalized because of feeding difficulties, GERB, and hypotrophy. As in the first case, phenotypic features and delayed psychomotor development are present, differences are microretrognathia, borderline FT4 and TSH, and negative antiTPO antibodies. A karyotype is normal. The FISH analysis found 7q11.2 microdeletion. CONCLUSION: WBS is a rare genetic syndrome characterized by a typical phenotype. There is no specific treatment, they need multidisciplinary monitoring in the direction of improving the quality of life.

CR96

Osteogenesis imperfecta type IIC with mutation of the COL1A1 - variant of unknown significance

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Keywords**:** Osteogenesis imperfecta, fractures, COL1A1

Introduction: Osteogenesis imperfecta (OI) is a heterogeneous group of inherited bone and connective tissue diseases caused by mutations in the genes COL1A1 and COL1A2, resulting in a type 1 collagen defect. It's characterized by reduced bone density, frequent fractures, and deformities. Molecular genetic testing using next-generation sequencing (NGS) is essential to confirm the genetic background. Case report: This case represents a 4-year-old boy, born from the first pregnancy, of healthy non-consanguine parents. In the 32nd week of pregnancy, an ultrasound showed fractures of the extremities. Phenotype: wider and soft neurocranium, protruding tuber, wider nasal root, hypoplastic thorax; shorter arms and legs with deformities, arachnodactyly with joint hyperelasticity; calluses on long bones and ribs. Neurological status: independent walk on a broader basis, hypotrophic musculature, lumbar lordosis, regular mental development (IQ-110). Based on clinical signs and radiological features, OI type II form C was diagnosed. An unknown mutation of the COL1A1 gene c.3821A> C (p.Tyr1274Ser) found on NGS was rated as VOUS (variant of unknown significance). Although is a lethal type, unknown mutation allowed prolonged survival in this patient. He has been on bisphosphonate therapy since birth. Conclusion: OI is mostly inherited autosomal dominantly, but can also occur as a *de novo* mutation. Affected individuals need a multidisciplinary approach in drug treatment, physical therapy, surgery, and proper nutrition to improve quality of life. The main goals are to reduce the number of fractures, suppress pain, improve bone mass and muscle strength, and ensure independent mobility and growth.

ABSTRACTS

Clinical Medicine, Literature Review & Other

CM01

Needle arthroscopy: revolutionary diagnostic method for knee imaging

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Keywords: nanoscopy, knee, arthroscopy, meniscus

Introduction: Nanoscopy, also known as IONA (In-Office Needle Arthroscopy), is a new diagnostic and therapeutic method, implemented in Croatia for several months, but well known to the world since 1990s, when it was introduced as an alternative to conventional surgical arthroscopy, and it has been deveoping since then. Nanoscope, equipped with a highresolution camera, a needle, not bigger than a needle for arthrocenthesis, with 2mm in diametar and a field of view of 120°, provides a real time picture with 0° angle. Procedure requires only topical antiseptic, local anesthesia and a sterile irrigation fluid over the portal sites.
Methods: Simplicity of using, good patients response, minimal risk compared to surgical arthroscopy, cost-effectiveness and cost-savings are the main advantages. Limitatations of nanoscopy are surgeons unfamiliarity in using 0° scope and limitation of excursion of small-bore needle due to scar tissue from previous surgeries. Minimal complications, higher sensitivity and specificity compared to MRI provide more accurate diagnosis of osteochondral bone defects, osteoarthritis, rupture of medial and lateral meniscus, rupture of anterior cruciate ligament and identifying intraarticular loose bodies.
Results: Needle arthroscopy showed safeess and effectiveness for evaluating the knee pathology.
Conclusion: Although surgical arthroscopy has long been the gold standard for knee evaluation in patients with chronic pain, nanoscopy has the potencial to become a method for minimally invasive approach to the knee, with the same accuracy and higher specificity than MRI.

CM02

Prevalence of preoperative anemia

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Keywords: anemia, preoperative care, patient blood management

Anemia and blood loss represent major risk factors in hospital perioperative setting. They increase surgical complications, transfusion and transfusion-associated complication rates, contribute to worse outcomes and increase odds of in-hospital mortality. Patient Blood Management (PBM) is a contemporary clinical principle to increase patient safety by optimizing patient's own blood resources. Evaluation of preoperative anemia in different types of surgical procedures may be a good starting point for raising awareness of importance of PBM. We prospectively collected data in one-week period in five different surgical departments in University Hospital Centre (UHC) Zagreb. The patients included in this study were candidates for elective procedures in departments of otorhinolaryngology (ENT), urology, cardiac surgery, general surgery and neurosurgery. We measured preoperative hemoglobin levels (Hb) as part of the preoperative patient evaluation and first postoperative Hb. We collected Hb data of 184 patients. Anemia cut-off level of Hb was 130 g/L for both sexes. Prevalence of preoperative anemia was between 20 to 40%, depending on department. There was no further evaluation of the cause of anemia. This study shows that there is significant rate of preoperative anemia in patients undergoing elective procedures. Current assessment of preoperative anemia in these patients is that patients with Hb of 70-130 g/L are not evaluated nor treated preoperatively. Changing our work practice in these situations by implementing PBM principles in patient care may lead to less complications and better outcomes.

CM03

Correlation of Preoperative Computed Tomography, Endoscopic Intraoperative Findings and Histopathologic Findings in Early Laryngeal Cancer

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Keywords: early laryngeal cancer, endoscopic surgery, computed tomography, histopathology

Malignant laryngeal tumors represent a major challenge in diagnosis and treatment, given the importance and location of larynx and the post-therapeutic impact on quality of life. The aim of this study was to evaluate the reliability of preoperative CT, endoscopic and histopathological findings and surgical outcomes in early laryngeal cancer patients treated with endoscopic laser surgery. This is a retrospective comparative cohort study including 81 patients treated from Jan 1st, 2016 until Dec 31st, 2016, with 3 years of postoperative follow-up. Patients were treated for T1 and T2 laryngeal squamous cell carcinoma by endoscopic laser surgery with preoperative CT imaging and postoperative histopathology reports. The outcome measures were presence of mismatch between clinical, CT and histopathologic staging, positive postoperative margins and need for postoperative radiotherapy. Binary logistic regression identified clinical T1a and T1b categories (p=0.001, OR 12.67), CT positive for anterior commissure involvement (p=0.008, OR 9.74) or supraglottic involvement (p=0.002, OR 10.06) as positive predictors for a mismatch in endoscopic and CT findings. Endoscopic tumor staging (p=0.0076), suspected anterior commissure involvement on CT (p=0.017), and tumor extension into the supraglottis or subglottis on CT findings (p=0.017) as well as mismatch between endoscopic and CT tumor staging (p=0.0325) were identified as risk factors for positive margins and postoperative radiotherapy. In small, superficial T1a and T1b glottic tumors, endoscopy should be the preferred diagnostic method. Therapeutic decision making should not only rely on the most sensitive and specific diagnostic method, but also on the combined result of endoscopy, and CT imaging.

CM04

Prognostic impact of mean platelet volume/platelet ratio in patients with diffuse large B-cell lymphoma

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Keywords: Mean Platelet Volume, large B-Cell lymphoma, neoplasms

In recent years, mean platelet volume (MPV) has become an important indicator, especially for inflammation. MPV and platelet count are been increasingly used to predict disease outcomes, especially for cardiovascular and cerebrovascular diseases. In this study, we aimed to determination whether baseline MPV/platelet count ratio have a prognostic significance in diffuse large B-cell lymphoma (DLBCL). We retrospectively analyzed the data from 45 DLBCL patients treated with R-CHOP or R-CHOP like regimens at the University Hospital Center Osijek, Croatia. We evaluated the significance of MPV/platelet ratio as a predictor of response to treatment, overall survival (OS) and event-free survival (EFS). Twenty- four were men and median age of all patients was 65 years (IQR 57.5-72 years). The median follow-up time for all patients was 21 months. In patients with advanced disease and those with IPI of > 2, MPV/platelet ratio was not lower (P = 0.988; P = 0.649). Patients who responded to therapy did not have higher MPV/platelet ratio than those who did not respond to therapy (P = 0.177). We next performed the ROC (receiver operating characteristics) analysis, which showed that MPV/platelet ratio was not a statistically significant factor for mortality. Area under curve (AUC) for MPV/platelet ratio was 0.623 (95% CI 0.466 - 0.763, Z = 1.357; optimal cutoff value was 0.038, with 68.7% sensitivity and 69% specificity, P= 0.175. MPV/platelet ratio did not show prognostic value for survival for patients with DLBCL. A limitation of the study is its retrospective design and single institution experience.

CM05

The most common medication side effects in internal medicine emergency department

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Keywords: side effects, organ damage, emergency department, angioedema, bleeding

Medication side effects are seen very often in emergency departments. Multiple studies show high frequency of side effects caused by anticoagulant overdose, while other usually pass unnoticed. We aimed to show the actual frequency of side effects, due to medication usage, in patients examined at internal medicine emergency room. Out of all of the patients treated during January and February 2020 at Clinical hospital Merkur internal medicine emergency room, 50 were found to have one of the possible side effects of their regular therapy. Study included 29 female and 21 male examinees who were averagely 64 years old (min 19, max 94). It was estimated which of the medications taken regularly could be the main cause of chief complaint. Out of all cases recorded, ACE inhibitors were the main cause of 16 side effects (32%), amlodipine caused 5 (10%), metformin 4 (8%) and warfarin only 3 (6%) determined side effects. The most frequent side effect manifestations were organ damage in 10 (20%), angioedema in 7 (14%), edema in 6 (12%), hemorrhage in 4 (8%) and gastrointestinal symptoms in 4 (8%) patients. Urticaria, commonly associated with medication side effects, occurred in only 2 patients (4%). None of the side effects were seen to be more often in patients with diabetes mellitus. Although the widespread opinion is that warfarin overdose causes the most common side effects seen at emergency rooms, antihypertensive and metformin therapy-related side effects are seen more often, presented as angioedema or organ damage.

CM06

The role of MRI in diagnosis of Alzheimer's disease

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Keywords: Alzheimer's disease, AD, MRI, neuroimaging

INTRODUCTION: Alzheimer's disease (AD), the most common cause of dementia, is a growing global health concern with more than 35% of the population over the age of 80 developing the disease. Structural imaging, especially magnetic resonance imaging (MRI) and PET CT, are recommended in diagnostic work-up of all patients with clinical presentation corresponding to AD. Aim of this paper is to discuss the importance and contribution of MRI in diagnosing AD. METHODS: We conducted retrospective analysis of 117 patients, whose data was collected between 2008 to 2014 and is available in the database of the Department of Neurology, University Hospital Centre Zagreb. RESULTS: Of the total of 117 patients, 49 patients underwent brain MRI. Among the latter cohort, 71.4% (35 patients) presented MRI findings that were consistent with the diagnosis of AD. The data for patients treated at the Hospital prior to 2010 are not available in the electronic database. Results show steady increase in the proportion of patients who conducted neuroimaging, as well as an increase in MRI results corresponding to typical radiological finding for AD (31% in 2012 versus 78% in 2014). CONCLUSION: Brain MRI is nowadays widely available and valuable diagnostic tool in initial approach to patients with cognitive impairment, complementary to neurocognitive assessment. Imaging studies in AD, consisting of MRI, FDG PET and amyloid PET, allow comprehensive differential diagnostic assessment and prompt establishment of correct diagnosis. It is important to acknowledge increase in rate of scans radiologically matching clinical diagnosis.

CM07

Frequency of HER2 receptor overexpression and HER2 gene amplification in acinar type of lung adenocarcinoma

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Keywords; Lung adenocarcinoma, HER2 overexpression, HER2 amplification

The most common type of lung cancer is adenocarcinoma, comprising around 40% of all lung cancers. Human epidermal growth factor receptor 2 (HER2) is a membrane bound tyrosine kinase, whose gene is recognised as proto-oncogene in breast and gastric cancers. Reasons for the tumor cells behaviour are gene amplification and receptor overexpression. Our research's main objective is to determine frequency of HER2 receptor overexpression and HER2 gene amplification in acinar type of lung adenocarcinoma, which is the most common one. We analyzed HER2 receptor expression (Dako hercept test) and HER2 gene amplification (Chromogenic in situ hybridization) on a group of patients who were operated in a period between 2010. and 2017. From total number of patients (45), 67% of them were male, while 84,4% of them were smokers. Mean age was 60.2 ± 7.95. Mean tumor size was 4.76 ± 2.62cm. According to TNM classification the largest number of our patients (36%) were in T2a group and in T3 (24%). 36% of patients had metastasis in nearby lymph nodes (N1 and N2), while 13% of them had metastasis in other parts of the body (M1). Having in mind staging of lung adenocarcinoma our patients were in stages IB(24,5%) and IIB(24,5%). In 8,9% of our patients HER2 receptor was overexpressed, while HER2 gene amplification was founded in 13,3%. According to our results, a higher positivity of HER2 status in acinar type of lung adenocarcinoma was found by applying in situ hybridization techniques to detect gene amplification.

CM08

Surgical treatment of medical complications in drug addicts-our experience

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Keywords : Drug addict, sepsis, surgical treatment

Surgical complications in intravenous drug users are present more frequently due to the increasing number of drug users in the world. The most common and the most important surgical complication is the infected common femoral artery (CFA) pseudoaneurysm, others are abscesses and thrombophlebitis at the site of drug injections. The therapeutic regimen is usually surgical. In the period from 2010 to 2020, 20 patients were admitted to the Department of Vascular surgery due to complications with intravenous drug abuse: 13 patients (65%) were male, seven patients (35%) were female, median age 34. Diagnostic evaluation combined clinical examination, laboratory findings and bacteriological analysis of wounds and abscesses isolates, colour doppler ultrasound, MSCT, and angiography. Two patients (10%) were presented with retroperitoneal abscesses, one patient (5%) had contained rupture of CFA infected pseudoaneurysm, one patient (5%) had a retroperitoneal abscess and ruptured infected CFA pseudoaneurysm, three patients (15%) had abscesses in the groin, ten (50%) had abscesses of the upper arm. Three patients (15%) had inflammation of leg ulcers. Surgery was performed in 17 patients (85%), while in three patients (5%) conservative treatment was done. In the clinical follow-up, one patient (5%) presented with gangrene of the right leg and amputation was done and one patient (5%) had a left foot ulcer that healed two months later. Medical complications in drug addicts could be very demanding for surgeons and often require vascular surgery engagement. Untreated patients or delayed surgical procedures could lead to limb amputation or even lethal outcomes.

CM09

DA-R-EPOCH as front-line treatment for high-risk diffuse large B-cell lymphoma (DLBCL) of the elderly patients: single center study

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Keywords: Diffuse large B cell lymphoma, Dose escalation, Elderly, Therapy

Outcomes of patients with high-risk DLBCL treated with R-CHOP are unsatisfactory. DA-R-EPOCH might be more effective; elderly patients tolerate this regimen. We therefore introduced DA-R-EPOCH as front-line treatment in elderly high-risk DLBCL patients. We performed this study to describe outcomes of these patients and compare them to historical controls treated with R-CHOP/CEOP. This was a retrospective non- interventional study. Data were collected by chart review. 31 patients older than 60 (median 67) with DLBCL and age adjusted international prognostic index (aaIPI)≥2 received DA-R-EPOCH. 15 had bulky disease, 3 stage III and 28 stage IV. 22 patients had performance status (PS)≤2 and 9 3-4. Side-effects were significant; drug dose was escalated in only 8 (26%). Severe anemia occurred in 7, thrombocytopenia in 9 (granulocytopenia was universal), infections in 38 and cardiovascular side-effects in 9. Five patients died of toxicity, all with PS>2. 22 patients (71%) responded to treatment. After a median follow-up of 22 months, event-free (EFS) and overall survival (OS) at 2 years were 58%. PS was the only statistically significant prognostic factor; EFS of patients with PS≤2 at 2 years was 70% in comparison to 33% in those with PS>2. Outcome of the former group compares favorably to that of controls treated with R-CHOP/CEOP whose EFS at 2 years was 53%. Fit elderly patients with high-risk DLBCL might benefit from DA-R-EPOCH treatment. The toxicity of this approach in unfit patients is unacceptably high.

CM10

Etiology of ischemic stroke in young adults

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Keywords: Ischemic stroke, thrombophilia, young adults

Ischemic stroke is most commonly caused by atherosclerosis, but etiology may be different in younger patients. The aim of this study was to define etiology of ischemic stroke in patients younger than 60 years. This retrospective study included 31 consecutive patients that were referred to a hematologist due to the unexplained etiology of ischemic stroke. The median age of patients was 40 (range 22-56), and 58% were male. The workup included detailed personal and family history, laboratory evaluation of inherited and acquired thrombophilia (levels of protein C, protein S, antithrombin, homocysteine and lipoprotein (Lp) (a), testing for FV Leiden and FII20210A mutation, lupus anticoagulant and anticardiolipid antibodies), and performing transthoracic echocardiography and "bubble" test. Positive family history was recorded in 10 patients. Thrombophilia screening was performed in 24 patients and revealed 13 positive tests. Three patients were heterozigots for FV Leiden and three for prothrombin mutation, six had elevated FVIII and one had lowered values of protein S, three had high homocysteine levels. Three patients had high levels of Lp(a). Transthoracic echocardiography revealed open foramen ovale in 10 out of 27 patients, with venous- arterial (VA) shunt confirmed in all patients by "bubble" test. Additionally, in two patients VA shunt was described by "bubble" test after normal finding of echocardiography. Our findings suggest that venous thromboembolism might be a significant cause of ischemic stroke in young adults. Defining the underlying cause of ischemic stroke is of outmost importance as it significantly changes the treatment of the patient.

CM11
CAS with and without cerebral protection - incidence of new brain lesions on MRI

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Keywords: carotid artery stenting, cerebral protection, embolic debris, MRI lesions

Temporary distal filter (TDF) is one of the basic types of cerebral protection. It is a net-like device designed to capture embolic debris. The use of TDF in carotid artery stenting (CAS) is presumed to help bring down the incidence of new brain lesions perioperatively. This paper calls that presumption into question and discusses possible risk factors (e.g. hypertension and smoking) that might play an important role in the operative outcome. METHODS We opted for a retrospective analysis of 36 patients' records from the Department of Diagnostic and Interventional Radiology, University Hospital Centre Zagreb from November 2018 until March 2020. The data were obtained using Microsoft Excel 2016. RESULTS Our study included 36 patients of which 23 (64%) underwent an unprotected CAS procedure, and 13 (36%) underwent a protected one. Mean age of the patients was 70 years (± SD = 8,3yrs). Male to female ratio was 2,6:1. Interestingly, only 1 protected patient (8%) had subsequent lesions on MRI, as opposed to 8 unprotected patients (35%). No patient was symptomatic. Overall, unprotected patients had a higher total number of health risk factors. However, the data is inconclusive in regards to any health risk factor playing a role in a perioperative lesion occurrence. Our research suggests that the incidence in new brain lesions was higher in the unprotected group of patients. Due to a small sample size, importance of health risk factors in the perioperative outcome isn't very clear.

CM12
The emergency medical care of patients with stemi – MONA

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Keywords: STEMI, MONA, ESC guidelines, ticagrelor, emergency department

INTRODUCTION/OBJECTIVES: Acute ST-elevation myocardial infarction (STEMI) is an event in which transmural myocardial ischemia results in myocardial injury or necrosis. Current ECS guidelines suggest treatment with aspirin, ticagrelor, and oxygen (if SpO290%) can be harmful. In contrast, most medical undergraduate textbooks still state that "MONA" (morphine, oxygen, nitrates, and aspirin) should be the primary therapy. The study aims to determine which guidelines are being followed in practice, at the UHC Zagreb. MATERIALS AND METHODS: Data were collected from patient medical records using hospital information system database in the three year period (2017-2019). A total of 356 patients fulfilled inclusion criteria, as in being admitted and treated for suspected STEMI. RESULTS: There was a noticeable reduction in adherence to "MONA" in oxygen supplementation (P=0.041), nitrate treatment (P=0.005), and morphine application (although not statistically significant), while the proportion of aspirin-treated patients remained high and stable over the three years. Comparing the use of ticagrelor therapy in ED (as per ESC guidelines), we observed a trend towards reduction over the years, which remain to be explained. CONCLUSION: Medical undergraduate textbooks should be updated regarding STEMI treatment and follow the ECS guidelines, as ECS guidelines recommend current best practices and ensure best outcomes.

CM13

Interventricular septal thickness as a diagnostic marker of fetal macrosomia

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Keywords: Fetal Macrosomia,Macrosomia, Interventricular Septal Thickness, Prenatal Cardiology

INTRODUCTION/OBJECTIVES: Serious complications in both mother and child arising as a result of fetal macrosomia indicate the need for early diagnosis and prevention. Unfortunately, current predictors such as fetal biometry, fundal height and amniotic fluid index appear to be insufficient. Therefore, we decided to assess the predictive potential of interventricular septal thickness (IVST) as measured in ≥33 weeks of gestation. MATERIALS AND METHODS: 299 patients met the inclusion criteria: ≥33 weeks of gestation and a complete medical history including all necessary measurements, namely IVST obtained by M-mode echocardiography, fetal biometry information and birth weight. Statistica 13.1 PL software was used to generate the receiver operating curve. RESULTS: 46.43% of macrosomia cases were predicted based on fetal biometry abnormalities. IVST is a promising macrosomia predictor, with an area under the curve of 0.644 (0.525-0.762; p=0.0177). Using the Youden index method, a cut-off point of 4.7mm was selected as the most optimal threshold for diagnosis, detecting up to 71.43% of cases. CONCLUSION: IVST at ≥4.7mm appears to have a higher sensitivity and NPV than ultrasound, which was reported both here and elsewhere.

LR1

Hypothyroidism during pregnancy

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Keywords: hypothyroidism, pregnancy, TSH

INTRODUCTION/OBJECTIVES Changes in thyroid function tests during pregnancy are result of physiological alternations of thyroid homeostasis. However, thyroid disorders occur in pregnancy as well. Objective of this review is the importance of detection of thyroid dysfunction in pregnancy.
MATERIALS AND METHODS PubMed, Web of Science, Scopus, and Other Non-Indexed citations were searched in order to collect relevant data.
RESULTS Newly discovered overt hypothyroidism during pregnancy (elevated TSH, low thyroxine (T4) levels) has a prevalence of 0,2–0,5%. In contrast, subclinical hypothyroidism, defined as an elevated TSH concentration with normal serum T4 levels, has a prevalence up to 2% during pregnancy. Subtle changes in thyroid function are detected better measuring free T4 (fT4) rather than T4, and are therefore more commonly used. Hypothyroidism during pregnancy is often associated with multiple adverse maternal and neonatal outcomes. Once overt hypothyroidism is diagnosed, the treatment with levothyroxine is to be initiated in order to achieve serum TSH level within the reference ranges for pregnancy as soon as possible. For pregnant women that present with subclinical hypothyroidism, treatment recommendations differ between various professional groups. It is due to inconsistent data from different studies regarding the benefits for mother and child. The value of levothyroxine therapy in preventing these adverse outcomes remain uncertain.
CONCLUSION While there is no consensus on the need for routine screening on hypothyroidism and the need for pharmacological treatment in case of subclinical hypothyroidism, Croatian Thyroid Society recommends screening for all pregnant women at the first visit.

LR2

Glucocerebrosidase gene mutation and Parkinson disease

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Keywords: Parkinson disease, Glucocerebrosidase, Mutation, Lysosomal

Parkinson disease (PD) is debilitating neurodegenerative disease characterised by neuronal loss and accumulation of misfiled proteins in brain suggesting; impaired clearance of proteins plays important role in PD pathogenesis. Growing body of evidence suggests that genetic factors inflicting lysosomal function may play important role in PD neurodegeneration. Mutatons in glucocerebrosidase (GBA) gene are implicated in Gaucher disease, lysosomal storage disease. Aim of this study is to discuss association between mutations in GBA gene, and resultant lysosomal dysfunction, with clinical presentation of PD. Literature review of 34 articles of UpToDate and Pubmed bases on pathogenesis of PD performed in March 2020. Key words for search were mutations in GBA gene, Parkinson's disease, and clinical features of PD. GBA gene mutations are significantly more likely to be found in patients with PD, with odds ration 5.43. Also, presence of GBA mutations correlates with different clinical profile. Patients with known GBA mutation are significantly more likely to have younger age of onset, cognitive impairment and positive family history of PD. However, tremor, bradykinesia and rigidity are less prominent in patients with GBA mutation. Furthermore, asymmetric onset is less frequent in patients with GBA mutation. Mutations in GBA gene represent one of single largest factors for development of PD and are linked with different clinical features of the disease. Better understanding of lysosomal disfunction, such as seen with GBA mutation, could potentially improve the development of new therapeutic targets for a more personalised PD treatment.

LR3

Immunotherapy in advanced non-small cell lung cancer treatment

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Keywords: immunotherapy, non-small cell lung cancer, Pembrolizumab

Lung cancer has a significant role in cancer-related deaths worldwide. Depending on cell type, 85% of all lung cancers are classified as non-small cell lung cancers (NSCLC). The majority of molecularly tested NSCLC do not show genetic alterations, which makes targeting therapies ineffective. However, immunotherapy has shown increase in survival of these patients, especially for patients with advanced stage lung cancer. This study is based on a literature review of immunotherapy indicated in advanced stages of NSCLC, which was made in March 2020 through UpToDate online search. Recent studies showed that certain drugs (eg. Pembrolizumab, a monoclonal PD-1 antibody) can help boost the immune system to fight against cancer. They can be used concomitantly with chemotherapy or as a monotherapy. With chemotherapy, Pembrolizumab made improvement in overall survival compared with chemotherapy alone. Not only did immunotherapy increase survival sometimes from 14 to 30 months, but it has also reduced treatment-related adverse effects significantly (27 versus 53 percent with chemotherapy). Immunotherapy of NSCLC has shown improvement in survival and quality of life. Pembrolizumab has shown significant results in cancer treatment. Not only did immunotherapy increase overall survival rate, but it had significantly fewer adverse effects such as severe pneumonitis. However, no trial has so far evaluated efficacy of chemotherapy plus pembrolizumab versus pembrolizumab alone, which requires additional trials to be performed in order to evaluate fully this treatment's risks and benefits.

LR4

Hemolytic anemia as side effect of usage of antimicrobial drugs in people with glucose 6 phosphate dehydrogenase deficiency

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Keywords: haemolytic anaemia, glucose 6 phosphate dehydrogenase deficiency, G6PD deficiency, antimicrobial drugs, antibiotics

Glucose 6 phosphate dehydrogenase deficiency is the most prevalent enzyme deficiency in the world. Although most affected individuals are asymptomatic, the red cells of patients with inherited deficiency are sensitive to the haemolytic effects of a wide variety of drugs; antimalarials and antibiotics included. The importance of acknowledging this deficiency as the possible cause of haemolytic anaemia lies in the relatively high prevalence of this mutation in the population of south of Croatia (0.75% in men). This study is based on a literature review of safety of use of antimicrobial drugs in patients with established G6PD deficiency which was performed in January 2020. With the help of information collected from the official G6PD Deficiency Association site, we analysed the available literature through PubMed online search of articles published in the last 15 years. Antibiotics commonly-involved in acute intravascular haemolysis are Dapson and Nitrofurantoin. Additional culprits include some antimalarial drugs, especially primaquine. Haemolytic anaemia is also listed among rare, but significant adverse effects associated with use of fluoroquinolones. Ciprofloxacin is classified as being unsafe in patients with G6PD deficiency „Mediterranean type“, however, haemolytic reactions have been hardly ever described. There was no evidence, over the last 15 years, regarding the haemolytic effects of isoniazid, trimethoprim-sulfamethoxazole and streptomycin, although those medicines are listed as unsafe on the official website. Since antimicrobial drugs are widely used, additional caution and individualization of pharmacotherapy are required in patients with known G6PD deficiency. Considering there is not enough evidence regarding this topic, more research is necessary.

LR5

The potential of virtual reality in the treatment of phobias

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Keywords: virtual reality, phobias, exposure therapy, VR

The worldwide lifetime prevalence of specific phobias ranges from 3% to 15%. The treatment of choice is exposure therapy, where patients are gradually confronted with objects and situations that make them anxious. The golden standard for treating phobias remain in vivo and imaginal exposure therapies. Virtual reality (VR) enables patients to experience situations through computer simulations and makes them feel immersed and able to interact. The objective of this literature review is to examine the efficacy and safety of VR in the treatment of phobias as well as its advantages over in vivo exposure therapy. This study is based on a literature review of VR technology in the treatment of phobias, which was performed in January 2020 through PubMed online search. Most studies show that VR exposure therapy has equal or even somewhat greater efficacy than other exposure therapies. It has been proven that it can be useful in the treatment of phobias of spiders, driving fears, flying, storms and heights. VR is a great choice when it is necessary to simulate situations that are difficult or expensive to produce in a live setting. The significant value of VR lies in patients' comfort and safety. VR has great potential to be used as an effective method in the treatment of phobias. One of the challenges that need to be overcome is the acceptance of this technology by clinicians. However, further research is needed in order to firmly establish VR as an effective and valuable treatment alternative for mental health disorders.

LR6
Ketogenic diet and Alzheimer's disease

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Keywords: ketogenic diet, Alzheimer's disease, glucose metabolism, ketone bodies

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by a decline in cognitive functions. Abnormal metabolism, deposition and clearance of two proteins – Aβ and tau, appear to be closely linked to the pathogenesis. The ketogenic diet (KD) is a diet containing low carbohydrate and high-fat content that results in the production of ketone bodies. This type of diet could be used for the prevention and treatment of neurodegenerative diseases and our goal is to discuss the possibility of using KD as a treatment and prevention of AD, since available treatments have minimal efficacy. To provide information on the effectiveness of ketogenic diet in the prevention and treatment of AD, we used ScienceDirect with keywords ketogenic diet, Alzheimer's disease, glucose metabolism and ketone bodies. The studies were limited to randomized, double-blind, placebo-controlled, crossover studies. 4 results fulfilled the inclusion criteria. One study failed to prove that increased ketone body levels coincide with improvements in cognitive test results, while others detected significant improvements of some cognitive functions in mild-to-moderate AD patients consuming ketogenic formula chronically. Another study showed that the KD is associated with improved CSF AD biomarkers, improved peripheral lipid and glucose metabolism and increased cerebral perfusion. Given that systemic metabolic dysfunction increases the risk for the development of AD and cognitive decline, beneficial effects of KD on peripheral glucose and lipid metabolism may provide a therapeutic tool for the prevention of age-related AD. The studies have several key limitations, despite promising results. Therefore, further meta-analysis should be done.

LR7
Novel coronavirus (COVID19) and its effects on-nervous system. A Literature review.

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Keywords: COVID19, nervous system, ACE2 receptors

INTORDUCTION/OBJECTIVES: The World Health Organization declared COVID19 outbreak a pandemic. COVID19 infection usually causes pneumonia. Additionally, some patients presented with neurological symptoms. The aim of this review is to present recently published literature on effects of COVID 19 on nervous system. METHODS: The PubMed and Google Scholar database was searched using the terms„COVID19 nervous system" and „COVID19 CNS" . We reviewed all three articles published on this topic so far. RESULTS: It has been shown that COVID19 enters cells through ACE2 receptors. These receptors have also been detected in glial cells and neurons making it possible for COVID19 to enter CNS. Samples from patients infected with SARS – CoV a virus highly similar to COVID19 demonstrated presence of virale particles in the brain. Studies on mice showed that SARS-CoV and MERS-CoV were able to enter the brain intranasally. Proposed route of COVID 19 entry in brain is either across cribriform plate of ethmoid bone or through systemic circulation. Study from Wuhan China showed that severe patients were more likely to develop neurological symptoms including acute cerebrovascular disease. Some patients developed hyposmia indicating that transcribrial route of entry in brain is possible. CONCLUSION: In conclusion, studies show it may be possible for COVID19 to infect nervous system. It is important to know that although CNS infection is possible most COVID 19 patients die due to homeostatic dysregulation caused by pulmonary, renal and cardiac damage. Nevertheless, it would be useful to identify patients with neurological symptoms since they have poorer prognosis.

LR8
Chloroquine as effective treatment for 2019-nCoV infection

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Keywords: Pneumonia, Chloroquine, COVID-19, Antiviral, 2019-nCoV

The novel 2019-nCoV first emerged in December 2019 in the Chinese city of Wuhan as a cause of bilateral pneumonia. Now it has claimed thousands of lives and spread to more than 18 countries worldwide. Specific treatment remains to be found. This virus belongs to the Betacoronavirus genus that also contains MERS-CoV and SARS-CoV with which it shares 75-80% genome similarity. Chloroquine, an old antimalarial drug, demonstrated in vitro ability to inhibit viral growth of SARS-CoV cell cultures. Several recent publications brought attention to the possible clinical use of chloroquine in the treatment of patients with Covid19. Electronic bibliographic database PubMed was searched for publications using the terms: 2019-nCoV; Antiviral; COVID-19; Chloroquine; SARS-CoV-2; pneumonia. In an vitro study published in the journal 'Nature', chloroquine was shown to block 2019-CoV infection at low-molecular concentration with a half- maximal effective concentration of 1.13 μM and a half-cytotoxic concentration greater than 100 μM. Additionally, a number of clinical trials have been conducted in 10 hospitals in China, with an aim to test the safety and efficacy of chloroquine therapy for 2019-CoV caused pneumonia. Results obtained from more than 100 patients demonstrate that chloroquine phosphate leads to an improvement in lung imaging findings, shortening of the disease course, inhibition of exacerbations and speeds up virus-negative conversion. Although on a small sample, Chloroquine demonstrated admirable efficacy in treating 2019-CoV infection in vitro as well as in vivo. Further clinical trials are needed to establish the place of Chloroquine in the therapy of Covid19 with more certainty.

LR9
Oxytocin promises hope in the treatment of hyperphagia in Prader-Willi syndrome

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Keywords: hyperphagia, intranasal oxytocin, Prader-Willi syndrome

Prader-Willi syndrome is a neurodevelopmental genomic imprinting disorder characterized by early-childhood onset obesity and hyperphagia, developmental delay, and many other problems, including a particular behavioral phenotype. Currently, the growth hormone therapy is the only FDA-approved specific treatment. However, hyperphagia is still not well regulated and remains a significant issue. This study aims to discuss the most recent discoveries regarding the effects of intranasal oxytocin application in PWS patients, and compare them with observations seen in our four patients being treated at the UHC Zagreb with the consent of the parents and ethics committee. We used PubMed with keywords Prader-Willi syndrome, intranasal oxytocin, and hyperphagia. The abstracts were limited to randomized, double-blind, placebo-controlled, crossover studies published in English. Five results fulfilled the inclusion criteria. Our own experience with four patients will also be shown. With the exception of one study, all proved positive effects of intranasal oxytocin on hyperphagia and behavioral symptoms of PWS patients. In addition, one study emphasized age-related response to intranasal oxytocin, being positive in patients younger than 11 and negative in patients older than 11 years of age. No major side effects or adverse events were reported. In terms of decreased appetite and regulation of behavior, our preliminary experiences are comparable to the results of international studies. Hyperphagia and obesity are still one of the leading causes of morbidity in children with PWS. Having an effective and harmless appetite suppressant drug would be helpful in the long term management of this peculiar group of patients.

LR10
Trifarotene for treatment of acne vulgari

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Keywords: Trifarotene, Treatment, Acne, Retinoid

INTRODUCTION An important component of acne vulgaris treatment, topical retinoids act on retinoid acid receptors(RAR) and retinoid X receptors. While older topical retinoids act on RARβ and RARγ receptors, new topical retinoid, trifarotene is selective for RARγ type, which is mostly present in the skin. This selectivity is hypothesised to be responsible for efficacy similar to that of older agents coupled with improved drug safety. Moreover, during its development, trifarotene efficacy was evaluated on facial and truncal acne, whereas performance of other topical retinoids is based mostly on treatment of facial acne. MATERIALS AND METHODS This study is based on UpToDate and Pubmed literature review of availability of new treatments for acne vulgaris, performed in January 2020, with focus on treatment of facial and truncal acne with topical trifarotene. RESULTS Trifarotene was successful in 29-42% of patients with moderate facial acne, with even higher effectiveness for moderate truncal acne (success in 36-43% of patients). Studies have also found that efficacy of trifarotene may increase with long-term use. Side effects of trifarotene are similar to those of other retinoids, with transient skin irritation being most common. However, skin irritation potential of trifarotene has not been directly compared with other retinoids. CONCLUSION Trifarotene appears to be safe and effective treatment for patients with moderately-severe facial and truncal acne. Selectivity of trifarotene could be safer, while equally effective therapy for acne vulgaris. However, this still has to be proven by direct comparison with other topical retinoids.

LR11
The relationship of the evening chronotype and social jetlag in the context of unhealthy behaviors

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Keywords: evening chronotype, social jetlag, unhealthy behavior, health

Preference for later bedtimes and rise times characterize evening chronotypes. Evening chronotypes suffer from early work start times thereby contradicting their natural circadian rhythms, as a result, a late wake-up time on free days reflect an attempt to compensate for a sleep debt accumulated on work days. This leads to a misalignment in sleep timing between weekdays and weekends, known as social jetlag (SJL), which is associated with increased health risk. The chronotype may potentially modify individual life behavior. We set a goal to find out which unhealthy behaviors among evening chronotypes may increase the harmful effects of SJL. The databases of PubMed and Embase from 2010 to the present were used. Search terms included "evening chronotype", "social jetlag", "lifestyle factors". Evening chronotype can compromise the maintenance of a healthy lifestyle. Evening chronotypes are more prone to bedtime screen use, which can suppress melatonin rise and extend wakefulness activities far into the night, thus dragging sleep and meal timing to later periods. Preference towards later time-of-day is linked with higher intake of total calories and fats, as well as unhealthy dietary habits (breakfast skipping, snacking, longer eating duration). Evening chronotype also has been associated with high caffeinated drinks intake, alcohol consumption and smoking, low physical activities. Lifestyle factors (screen-viewing behavior, delaying meal timing and sleep onset, alcohol consumption and smoking) might function as the promoting factors to circadian misalignment and greater SJL. Interventions to prevent and control unhealthy behaviors among evening types should be included in preventive measures of SJL.

LR12

Antidepressants: Background, Advantages and Disadvantages, Solutions and Future Implications

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Keywords: antidepressants, depression, major depressive disorder, neuroplasticity, psychotherapy in depression

Introduction: Antidepressants are medications used to treat major depressive disorder (MDD), some anxiety disorders, some chronic pain conditions and to help manage some addictions, but there is longstanding debate about their efficacy and effectiveness. Clinicians need high-quality evidence to guide the selection of antidepressant medication for individual patients. Newer treatments are looking beyond effects on monoamines as potential strategies to leverage depressive symptoms.
Solutions and future implications: Any antidepressant may lose its effect after months or years, sometimes because the brain has become less responsive to the drug (tolerance). Solutions include increasing the dose and switching to another antidepressant with a different mechanism of action. Looking beyond the role of monoamines as treatment targets in depression, a number of novel therapeutic strategies have begun to receive growing interest in preclinical and clinical trials like: ketamine and esketamine, opioids, antiinflammatories and immunomodulators, anticholinergic muscarinic agents, PPAR-γ agonists and incretins (glucagon-like peptide) which are described in this paper.
Future directions: Given the focus on neuroprotection and enhanced neuroplasticity as proposed targets of treatment, it would seem remiss not to at least mention the neurobiological impact of depression-specific psychotherapies, mindfulness meditation, and related psychosocial interventions. Enhanced neuroplasticity may represent a common denominator target for effective biological or psychosocial treatments for depression.
Conclusion: This brief overview has focused on emerging novel pharmacotherapies for depression. The aforementioned findings are largely preliminary and meant more to prompt larger randomized trials to establish efficacy, safety and generalizability rather than inspire premature immediate uptake into clinical practice.

LR13

Ketamine and esketamine for treatment of unipolar depression

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Keywords: Ketamine, Esketamine, Depression, Treatment

INTRODUCTION/OBJECTIVES: Ketamine is a racemic mixture of two enantiomers that is used as standard anesthetic, analgesic and sedation drug. It has been found that ketamine and esketamine can also rapidly and transiently alleviate treatment resistant unipolar major depression, including suicidal ideation. MATERIALS AND METHODS: This study is based on literature review of availability of new treatments for unipolar depression in adults, performed in January 2020, with a focus on treatment of resistant depression with ketamine and esketamine. RESULTS: While mechanism of their antidepressant action remains unknown, it is hypothesised that ketamine and esketamine both act by affecting multiple receptors in the brain. Receptors that seem to be involved include: Opioid and Alpha-amino-3-hydroxy-5-methyl-4-isoxazole propionic acid (AMPA) receptor. Short term efficacy of ketamine and esketamine for treatment of resistant depression appears to be comparable, with both compounds leading to rapid improvement in symptoms of treatment resistant depression, including decrease in suicidal ideation and significant improvement in nocturnal wakefulness. Also, both compounds appear generally safe and well tolerated in short term therapy. On the other hand, risks of long term treatment with ketamine and esketamine remain unknown and may entail more severe adverse effects as well as abuse and addiction. CONCLUSION: Ketamine and esketamine may be indicated for short term treatment of therapy resistant, severe unipolar depression as both drugs have been proven to rapidly and transiently alleviate symptoms of treatment resistant depression. However, these drugs should be prescribed rationally in order to prevent future abuse and addiction.

LR14

Benefits of using NSAIDs prior to the ERCP

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Keywords: ERCP, acute pancreatitis, NSAIDs

INTRODUCTION: ERCP (endoscopic retrograde cholangiopancreatography) is a diagnostic procedure done to look for diseases of the bile ducts and pancreas. A flexible tube is inserted down the throat, through the stomach, and into the small intestine. The doctor can see through the tube and inject dye into the drainage tube (duct) of the pancreas or bile duct so that the area can be seen more clearly on x-ray. The ERCP test is comfortable, it is performed under intravenous sedation or with general anesthesia and has a low incidence of complications. ERCP is associated with a 5%-10% risk of pancreatitis. METHODS: Data on costs of hospital stay and treatment were obtained from the Croatian health insurance. Information about the survey and positive effect of NSAIDs prior to ERCP were obtained from Harvard health blog. Data about the prices of possible NSAIDs were obtained from CHIF website. RESULTS: Comparing the data from Harvard health blog and their research in which 9%of the patients who were given indomethacin prior to ERCP treatment got post-ERCP pancreatitis and among 301 volunteers who were given placebo 16% of them got post-ERCP pancreatitis, we can conclude that treating patients prior to ERCP with NSAIDs can lower the risk of post procedure pancreatitis for almost 50%. CONCLUSION: This approach of giving NSAIDs prior to the ERCP procedure would be cost-effective and would also spare beds at the hospital. Patients would have less side effects from ERCP procedure and the post -procedure recovering would be faster and without complications.

O01

"Cherish your heart"– a public health project on cardiovascular health

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Keywords: cardiology, cardiovascular diseases, education, primary prevention, public health

The "Cherish your heart" project ("Čuvajmo naše srce" in Croatian) is a Students' Society of Cardiology project dating back to the year 2014. The main goal of the project is educating the public about the importance of cardiovascular health and prevention of cardiovascular diseases, the most common cause of death in the Republic of Croatia. In the past two years, our focus has primarily been on educating high school students by organizing workshops in Biology classes. The workshops are composed of a short lecture on the anatomy and physiology of the cardiovascular system, most common diseases, their treatment and, most importantly, prevention, including practical advice on lifestyle, diet and physical activity. After the presentation, the students get to practice their anatomy knowledge through dissection of a pig's heart and on a model of the human heart. By today, 2627 students all around Croatia have participated in the workshop. According to the surveys filled out by educated students and their teachers, over 90% of participants found the workshop useful. The project also has a Facebook page available to the general public, where we post about the workshops, as well as information and advice on how to improve cardiovascular health. In the future,

we plan to expand the project by educating adults in their workplaces, hopefully making an impression on their personal health care. We believe the project could be an important part of the public health endeavors in lowering cardiovascular death rate.

O02
POLYPILL vs. POLYMEAL approach for control of cardiovascular risks in Croatia

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Keywords: polypill, polymeal, Croatia, cardiovascular risk, control

INTRODUCTION Polypill is a fixed-dose drug combination treatment, that was introduced with the idea to increase compliance and reduce risks of cardiovascular diseases in the population. It is expected that this strategy could gain much traction, especially in low- and middle-income countries, where it could significantly reduce the burden of cardiovascular disease. “Polymeal” is a non-pharmacological approach, entailing fixed amounts of nutritive ingredients with established effects on reducing cardiovascular disease; the following ingredients are included: 114g fish, 150mL wine, 100g dark chocolate, 400g fruits and vegetables, 2.7g garlic, 68g almonds. OBJECTIVE To assess feasibility of using Polypill instead of Polymeal approach in Croatia for control of cardiovascular diseases risks. MATERIALS AND METHODS Data on the price of one Polypill tbl (Triplixam® 10/2.5/10mg tbl; Servier) in Croatia were obtained from Croatian Health Insurance Fund’s (CHIF) online registry. Information about prices of ingredients that are part of the Polymeal approach were collected from local supermarkets and the lowest prices were used for this comparison. RESULTS The cost of 1 tablet (defined daily dose -DDD) of Triplixam (10 mg perindopril, 2.5mg indapamid, 10 mg amplodipin) was estimated at 3.218kn without CHIF insurance and with it, it was 0.67kn. The cost of food for one day of adherence to the Polymeal strategy was calculated at crc. 31.79kn. CONCLUSION It appears it would be cheaper to take 1 tablet of Triplixam per day for control of risks of cardiovascular diseases than to adhere to the Polymeal strategy.

ABSTRACTS

Workshop Invitations

ECG in neurological diseases

Dear students, the student section of cardiology is organizing an interactive workshop in which we will talk about ECG findings in neurological diseases and symptoms. As it is necessary to know the basics of ECG, only students who have started with clinical rotations can apply for the workshop, which means students of the 4th, 5th and 6th year of study. At the end of the workshop there will be a competition section where the fastest one will win the prize. We look forward to your registration for the workshop!

Student section of cardiology

AUTHORS
Barbara Rubinić, Iva Karla Crnogorac, Ana Piršljin

ENT practical examination

The students will learn the basic of an Ear, Nose, Oral cavity and Throat examination. First, they will be shown how to do the examination, all the rules and steps to follow. Then they will be given a shot PP presentation of what is normal and what is pathological in the examination. After that, they will be divided into three groups of 4 people. Each group will be supervised by someone from the Society. In each group the students will perform the exam on each other, so each student will examine three other students and will be examined three times. If there would be enough time, we will shift the groups and continue.

Student society of Otolaryngology, Head and Neck Surgery

AUTHORS
Andro Kurtić, Josipa Živko, Klara Živković, Stela Marković

dr. Filip Bacan

Case solving

Problem solving and teamwork is essential part of being a good MD. Come to our workshop where you can see interesting cases and debate diagnoses with fellow attendees

Student society of dermatovenerology

AUTHORS
Hanna Pašić, Sara Đurović, Nora Rako, Marko Belamarić, Ena Parać, Ayla Hadžavdić

Prof.dr.sc. Suzana Ljubojević Hadžavdić

Prevention of neurodegenerative diseases with the MIND diet

In your clinical practice, patients with a new diagnosis will usually ask you about the lifestyle and nutritional changes they have to implement into their life. Doctors mostly answer those questions with rigid answers, without any explanation. That leads to a small compliance among the patients in which the lifestyle changes are essential for the prolongation of their healthy life years. We want to adress that problem and make you a physician who is ready to give correct nutritional advice to those who are at a higher risk on developing a neurodegenerative disease.

Students' section for the promotion of healthy lifestyle and nutrition and PROBION

Authors
Ema Kuhar, Antonia Cvrk, Antonia Precali, Dražena Čermak, Ela Matešić, Amanda Gaši, Đurđica Mijanović, Emanuel Brađašević

Neurogames

This year's Student society for neuroscience workshop will be all about applying basic neuroscience to everyday social media life. We will explain the most popular tricks and debunk the most interesting myths. It is a great opportunity to see how our brains work and to learn why we see things the way they are.

Join us to know more!

Student society for neuroscience

Authors
Katarina Babić, Lucija Batur, Anamaria Dukić, Anton Jakovčić, Pavel Marković

Barbara Vukić

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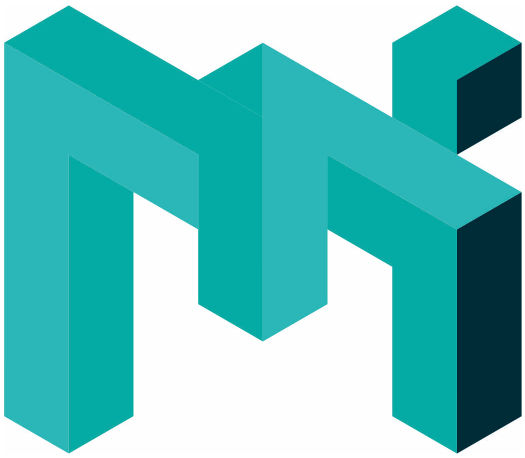


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