UDK 61(061.231)=862=20

CODEN LIVJA5
ISSN 1330-4917 (TISAK)
ISSN 1849-2177 (ONLINE)

LIJEČNIČKI VJESNIK

GLASILO HRVATSKOGA LIJEČNIČKOG ZBORA
THE JOURNAL OF THE CROATIAN MEDICAL ASSOCIATION
Utemeljen 1877. Founded 1877

CROATIAN STUDENT SUMMIT

BOOK OF ABSTRACTS

TRANSPLANTATION MEDICINE

APRIL 9-12, 2019

15th International Biomedical
Croatian Student Summit

University of Zagreb **School of Medicine**

CROSS 15
CROATIAN STUDENT SUMMIT FIFTEEN

Liječ Vjesn God. | Vol. 141 [2019] Supl. broj | Suppl. num. 1 Str. | Pag. 1–80 Zagreb, Hrvatska | Croatia

LIJEČNIČKI VJESNIK

Utemeljen 1877. Founded 1877

Osnivač i izdavač / Founder and Publisher
HRVATSKI LIJEČNIČKI ZBOR

Za izdavača / For Publisher
ŽELJKO KRZNARIĆ

Glavni i odgovorni urednik / Editor-in-Chief
BRANIMIR ANIĆ

Tajnica redakcije / Secretary of the Editorial Office
DRAŽENKA KONTEK

Rješenje naslovne stranice / Front Page Design
BRANKO VUJANOVIĆ

Tisak / Printed by
PRINTERA GRUPA – Zagreb

Web stranica / Web page
ALEN BABACANLI

Zagreb 2019.

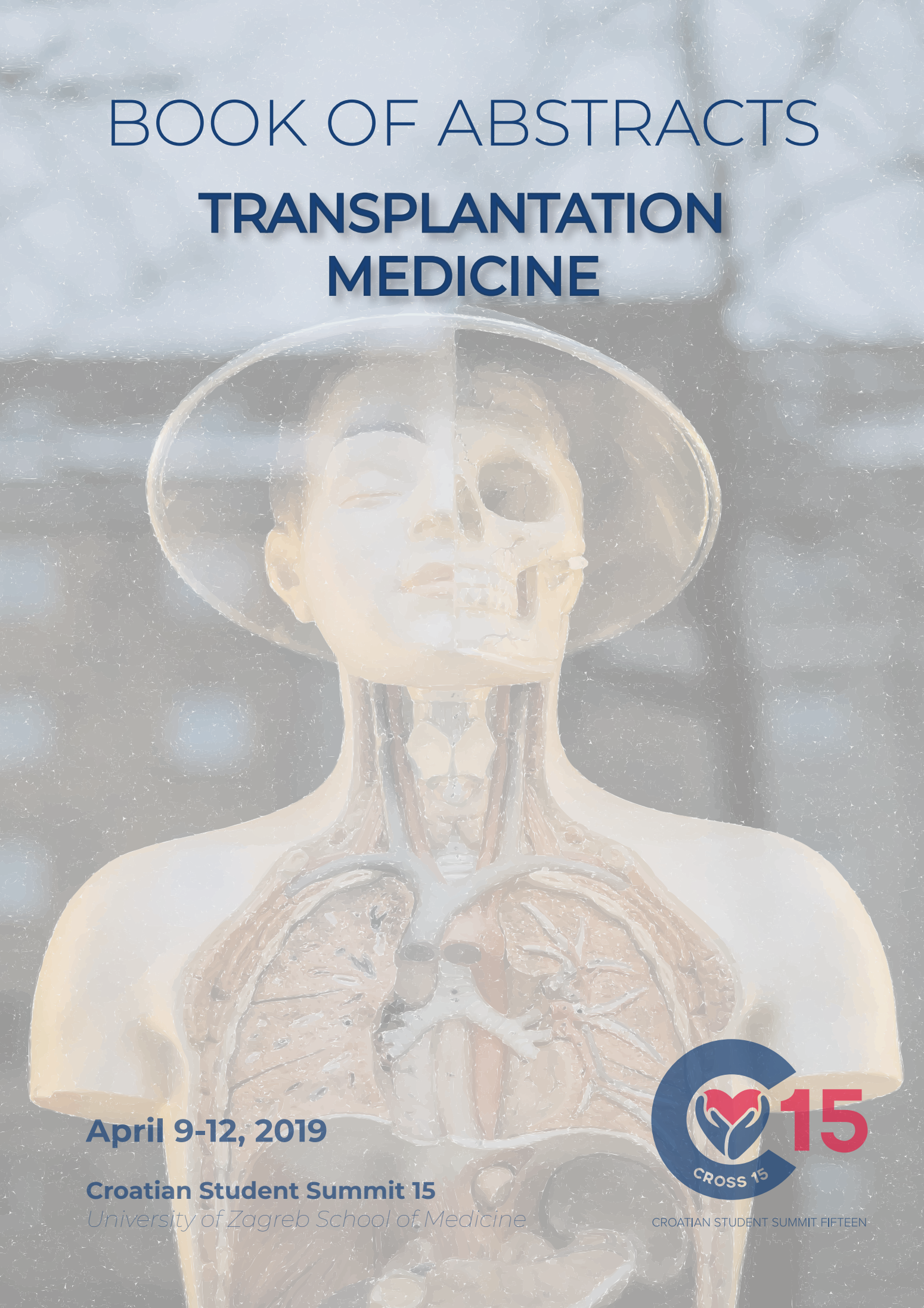
Naklada 500 primjeraka

Rukopis i svi članci šalju se *Uredništvu Liječničkog vjesnika,* Zagreb, Šubićeva ul. 9, tel. (01) 46-93-300, e-mail: lijecnicki-vjesnik@hlz.hr. Članarina, pretplata i sve novčane pošiljke šalju se Hrvatskomu liječničkom zboru, Zagreb, Šubićeva ulica 9, odnosno na žiro račun br. 2360000-1101214818 ili devizni račun br. 2100060384, Zagrebačka banka d.d., Savska c. 60, Zagreb, Swift: Zaba HR 2X, IBAN HR7423600001101214818, OIB 60192951611. Članarina Hrvatskoga liječničkog zbora iznosi 200 kuna; za liječnike pripravnike i obiteljska članarina iznosi 100 kuna. Pretplata za Liječnički vjesnik je 315 kuna (inozemstvo 84 eura). Radi redovitog primanja časopisa svaku promjenu adrese potrebno je javiti Uredništvu. Svaki član Hrvatskoga liječničkog zbora ima pravo besplatno objaviti članak u Liječničkom vjesniku; autori koji nisu članovi Zbora moraju platiti naknadu u iznosu od 187,50 kuna + PDV.

Liječnički vjesnik citiraju: MEDLINE/Index Medicus i EMBASE/Excerpta Medica.

BOOK OF ABSTRACTS

TRANSPLANTATION MEDICINE



April 9-12, 2019

Croatian Student Summit 15

University of Zagreb School of Medicine

CROSS 15

CROATIAN STUDENT SUMMIT FIFTEEN

CROATIAN STUDENT SUMMIT FIFTEEN

15th International Biomedical
Croatian Student Summit

Zagreb, April 9-12, 2019

EDITOR-IN-CHIEF
Jelena Gnjidić
Igor Radanović
School of Medicine, University of Zagreb

PUBLISHER
University of Zagreb
School of Medicine
Šalata 3, Zagreb, Croatia

FOR PUBLISHER
Marijan Klarica, MD, PhD
School of Medicine, University of Zagreb

In 1983, Dr. Joel Cooper performed the first successful lung transplant. The recipient was a 58-year old man with pulmonary fibrosis.

cross.mef.hr

TRANSPLANTATION MEDICINE

TABLE OF CONTENTS

In 1986, Dr. Joel Cooper performed the first successful double lung transplant.

cross.mef.hr

Committees

ORGANISING COMMITTEE

Marin Boban, *President*
Ivan Bandić, *Vice President*
Lorena Karla Rudež, *Vice President*

Borna Arsov
Lucija Batur
Mara Bebek
Morana Belović
Jakov Emanuel Bogdanić
Vito Bošnjak
Dora Cesarec
Tomislav Cigić
Tihana Duić
Dinko Ezgeta
Antonela Geber
Ayla Hadžavdić
Ema Liu
Anton Malbašić
Drago Marijanović
Maja Milenović
Igor Radanović
Deni Rkman
Tin Rosan
Kristian Dominik Rudež
Eva Rupert
Mislav Sekulić
Tomislav Smoljo
Marko Stručić
Tin Šklebar

SCIENTIFIC PROGRAM COMMITTEE

Igor Radanović, *President*

Mislav Čaić, *Poster Session Chair*
Mislav Glibo, *Workshop Chair*

Martina Fadljević
Jelena Gnjidić
Bruno Lovreković
Robert Marčec
Drago Marijanović
Barbara Rubinić
Tomislav Smoljo
Tin Šklebar
Lorka Tarnovski
Matea Turudić

Marijan Klarica, *ex-officio member*
Mirela Bušić, *ex-officio member*
Alan Ivković, *ex-officio member*
Branislav Kocman, *ex-officio member*
Anna Mrzljak, *ex-officio member*
Igor Rudež, *ex-officio member*
Lada Zibar, *ex-officio member*
Emil Dediol, *ex-officio member*
Katja Vince, *ex-officio member*
Mladen Knotek, *ex-officio member*
Inga Mandac Rogulj, *ex-officio member*

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

GUEST ATTENDANCE POLICY
All event activities (including workshops and meal functions) are exclusively reserved for registered attendees. Non-registered guests (including children, family members, colleagues, etc.) are not allowed in any of the event areas. Badges provided at registration are required for entrance into all functions and will be strictly enforced.

REGISTRATION DESK
Registration desk will be open as follows:

Tuesday, April 9: 11:00 - 17:00
Wednesday, April 10: 8:00 - 10:00

SOCIAL MEDIA
You are invited to follow CROSS 15 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 #CROSS15 to share your experience at CROSS 15!

LIABILITY AND INSCURANCE
The Congress 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
Certificate of attendance will be distributed the last day of CROSS 15, (Friday, 12 April).

PUBLIC TRANSPORTATION
The main building of the School of Medicine is located very near the city center 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 Program 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 Congress, on the CROSS 15 website during the Congress and in an online archive for one year following the Congress. Viewers will be able to easily find and browse and download the posters in PDF format when permitted by the presenter.
Each poster presentation should be about 5 minutes long. Plan your presentation accordingly and leave a minute for questions at the end 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.

EVENTS
We will host a number of events you may attend while at CROSS 15.

Buffet dinner and networking reception will be held at the School of Medicine in front of the Čačković hall on Tuesday, April 9, 19:00 - 19:40. **Gala dinner** will be held at the Rooftop Lateral (Strojarska Cesta 22) on Wednesday, April 10 starting at 20:00.

Additional events:

Zagreb Sightseeing Tour
Meeting point on Ban Jelačić square
Wednesday, April 10, 9:00 - 11:00

Museum Visit
Thursday, April 11, 8:30 - 10:30

Networking Event - Rakhia Bar
Tkalčićeva Street 45
Thursday, April 11, 21:00

Institute for Forensics and Criminology Museum Visit
Friday, April 12, 9:00 - 10:00

After Party
HOLLYWOOD vanity club, Tuškanac 1
Friday, April 12, 23:00

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.).

The Abstract Submitter warrants and represents that he/she is the sole owner or has the rights for all the information and content ("Content") provided to CROSS 15 (“Organisers”). The publication of the abstract does not infringe any third party rights including, but not limited to, intellectual property rights. The Abstract Submitter grants the Organisers a royalty-free, perpetual, irrevocable nonexclusive license to use, reproduce, publish, translate, distribute, and display the Content.
The Organisers reserve the right to remove from any publication an abstract which does not comply with the above.

Upon submission the Abstract Submitter confirms that the contact details saved in the system are those of the corresponding author, who will be notified about the status of the abstract. The corresponding author is responsible for informing the other authors about the status of the abstract.

ORCID® IDs

ORCID is a nonprofit organization whose mission is to solve the name ambiguity problem in scholarly communication by operating an open-access registry of persistent unique identifiers for individual researchers, and an open and transparent linking mechanism with other ID schemes and research objects such as publications, grants, and patents.

WELCOME
TO CROSS 15!

One donor can save eight lives.

April 9-12, 2019

Croatian Student Summit 15

University of Zagreb School of Medicine

CROSS 15

CROATIAN STUDENT SUMMIT FIFTEEN

Welcome to Zagreb...

Zagreb is the capital city of Croatia, situated in the northwestern part of the country along the river Sava and beneath the Medvednica mountain. Zagreb has a population of 810,003 but with the wider city area the number is closer to 1.2 million people. Because of its developed industries, many scientific and research institutions and transport connections, Zagreb is the cultural, scientific and economic centre of the country.

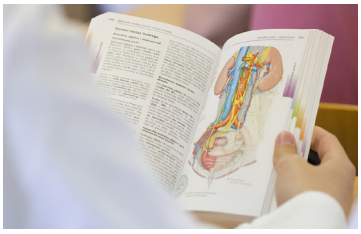
The history of Zagreb goes back to the Roman time. The Roman city of Andautonia was located in this area between the 1st and the 5th century AD. The earliest-known written reference to Zagreb dates to the year 1094. Back then, the city was divided into two parts: the smaller part of the city - Kaptol with the Zagreb Cathedral - and the larger part - Gradec. These two centres were united in 1851 by the count (or, in Croatian, "ban") Josip Jelačić. An important moment in the history of the city was Gradec becoming a free royal city in 1217 when king Bela IV gave Gradec a Golden Bull as a form of gratitude to people of Zagreb who offered him safety from Tatars. Besides a rich history, there are many legends about Zagreb. One of them is the legend of 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 right up until the end of the 19th century.

There are many interesting places to visit while staying in Zagreb! It is filled with beautiful architec-tural monuments, one of them being the Zagreb Cathedral which is the most monumental sacral building in Gothic style southeast of the Alps.

One can also go and see St. Mark's Church from the 13th century and admire its colourfully tiled roof with the medieval coat of arms of Croatia, Dalmatia and Slavonia on the left side, and the emblem of Zagreb on the right. Croatian National Theatre is a neo-baroque Zagreb masterpiece opened on 14th October 1895, which to this day offers exquisite performances of ballet, operas and theatre play. Many museums such as The Archaeological Mu-seum, Croatian National History Museum, Technical Museum, Arts and Crafts Museum, Mimara Museum and Croatian Museum of Naive Art are located in the very centre of the city. The Museum of Contemporary Art is located in the centre of a neighbourhood called Novi Zagreb and offers a rich exhibition of modern art.

Since 2016, Zagreb is known for its Christmas market which was elected as the Best Christmas market in Europe.

...AND OUR SCHOOL OF MEDICINE!



On the 25th of January 1917 Milan Rojc presented his proposal to establish a School of Medicine at the University of Zagreb in the Croatian parliament. On the 13th of November, this proposition was adopted. The three founders and professors were Dr. Theodor Wickerhauser, Dr. Miroslav Čaćković and Dr. Dragutin Mašek. A year later, on the 12th of January, Dr. Drago Perović gave the inaugurate lecture about the direction of teaching and research in anatomy which marked the beginning of classes for the School of Medicine. From that day onwards, The University of Zagreb School of Medicine functions as the largest, oldest and most respected institution which offers medical studies in the Republic of Croatia. Most of the basic science institutes and clinical departments were established from 1919 to 1922. The number of students increased over the years, reaching the number of 921 in the academic year 1938/39. After the second World War, the need for doctors increased so in the year 1948/49 the total number of students reached 2855. The interest for studying medicine was so high that in the academic year of 1965/66 the entrance exam was introduced and ever since it has been an obstacle every young future student of medicine has to overcome if they want to study in Zagreb.

Zagreb School of Medicine contributed to the development of medical institutes in Rijeka, Split and Osijek. Institutes in Split and Osijek were first regional branches of the Zagreb School of Medicine but later became independent. From its beginnings until now a lot of changes have been implemented at the Faculty, two of the most significant being the transition from five to six years duration of the study in 1990/91 and courses organized in blocks for preclinical subjects in 2002/03.

Many great doctors and scientist worked and contributed to the development of The University of Zagreb School of Medicine and practice of medicine in Croatia and the world. One of them is Andrija Štampar who established the Public Health service in former Jugoslavia and later in China. He was the director of The School for Public Health in Zagreb, headed the first Health Assembly in Geneva and wrote the constitution for WHO in 1948. Albert Botteri founded the Clinical Department for Ophthalmology and was an internationally recognized expert. Fran Bubanović founded the Medical -Chemical Institute in Zagreb School of Medicine. Franjo Durst was the first who unified Obstetrics and Gynaecology to one department in Croatia. Drago Perović, whose field of interest was the functional anatomy of the nose, paranasal sinuses and the labyrinth, discovered some unknown anatomical features in those formations. Ante Šercer was the first Croatian doctor who was internationally recognised for his work in the field of Otorhinolaryngology.

Because of its long tradition, high standards and recognized experts, Zagreb School of Medicine has always been able to produce one of the best doctors and thinkers.

Welcome Message

President of the CROSS 15 Organising Committee

Dear colleagues,

It is my pleasure to invite you to the fifteenth Croatian Student Summit called "Transplantation Medicine". The Croatian Student Summit or popularly called CROSS is a congress organized by the Students' Council of Medical University in Zagreb and has been continuously organized for the fifteenth year in a row. I would like to point out that CROSS is organized almost entirely by students and as such it presents an exceptional value for faculty as well as the university. Students have the opportunity to take part as passive or active participants at the congress, 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.

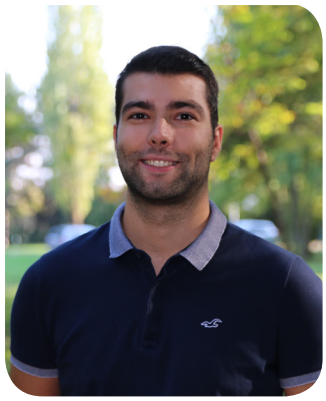
This year's topic of the congress is Transplantation Medicine. Given that Croatian transplantation teams are widely known for their success and Croatia is among the world's leading countries in organ transplantation, we have decided that it is time for CROSS to be dedicated to this extremely demanding and exciting branch of medicine.

This congress represents an excellent opportunity to exchange ideas, insights and achievements that can complement and enhance our knowledge and open up some other points of views. 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 for transplantation medicine in the future. Therefore, I invite you to join us at the Croatian Student Summit 15, which will be held from 09.4.2019. until 12.4.2019. at the School of Medicine, University of Zagreb

Marin Boban
President of the CROSS 15 Organising Committee

Welcome Message

President of the CROSS 15 Scientific Program Committee



Dear participants and colleagues,

On behalf of the Scientific Program Committee, I wish you a warm welcome to the fifteenth Croatian Student Summit, annual congress which gathers many students and young doctors and scientists every year.

This year's topic "Transplantation Medicine" is particularly special, since we have decided to choose a field where Croatia ranks among the top countries in the world – both in organ donations and transplantations. This gives opportunity for our congress participants to hear and learn from the very best.

The core idea behind this congress stays the same - introducing our students and young colleagues to beginnings of their scientific careers in an interesting way, allowing them to learn something new and to establish many connections with other colleagues and students from Croatia and from all around the world.

Additionally, as the Editor-in-Chief of this program book and book of abstracts, I am very proud that we have continued our collaboration with Liječnički vjesnik, the official journal of the Croatian Medical Association, in this way offering even more opportunities to our participants. I want to express my sincere gratitude The Editorial Board, Editor-in-Chief Prof. Branimir Anić, MD, PhD, Secretary of the Editorial Office Draženka Kontek, but also to our School of Medicine for making this continuing partnership possible.

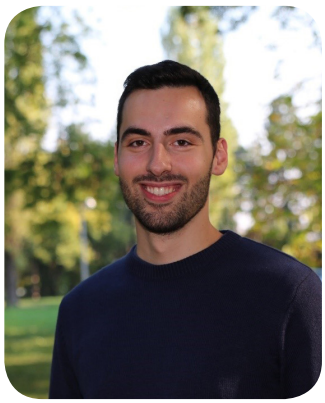
Nothing would be possible without the members of the Scientific Program Committee, who invested their time in improving the quality of the whole program, so I give special thanks to all of them, but also to the whole Organising Committee and Student Council of the School of Medicine.

I am looking forward to welcoming you in Zagreb and I wish you a successful congress!

Igor Radanović
President of the CROSS 15 Scientific Program Committee

Welcome Message

President of the Student Council



Dear Participants,

As the president of the Student council at the University of Zagreb School of Medicine, it is a great honor and privilege to be able to welcome you to this year's Croatian Student Summit - CROSS 15.

Croatian Student Summit is an annual student congress organized by the Student council of our School of Medicine. Throughout these fifteen years, CROSS has truly become a part of our Faculty's tradition. Since its small beginnings in 2004, the Congress has grown tremendously – in total it has hosted over one hundred esteemed lecturers and over one thousand student presentations. Thousands of participants from all over the world have had the chance to enjoy our Congress. We've had students from France, Hungary, Italy, Romania, Poland, Bulgaria, Scotland, the USA and many other countries, and with each year the number of international delegates participating at the Congress increases. We are very proud to have created a place for students to present their achievements and share their work with their colleagues.

At the University of Zagreb School of Medicine, we encourage scientific research, co-operation and exchange of ideas. Each year we try to improve our Congress – make it more competitive and interesting. Our continuity, numerous awards and an increasing number of participants are the best indicator that we are on the right track. We are proud of the names that have led CROSS all these years and that have left a mark on our School of Medicine. We are grateful for their contribution in promoting scientific student activities and events. Vision and enthusiasm led to the fact that the Croatian Student Summit has become an indispensable scientific event in Croatia, recognized in Europe and the world.

I would like to take this opportunity to thank the Dean of the University of Zagreb School of Medicine, Marijan Klarica, MD, PhD and the University of Zagreb Student council for their generous support. Without them and, of course, the Organizing and Scientific Program committees, this great story wouldn't be possible.

In the end, I would like to emphasize that although the focus of our Congress is to acquire new knowledge, CROSS is also a great place to meet colleagues and start long-lasting friendships. Make most out of your time here - explore the beautiful city of Zagreb and, most importantly, don't forget to have fun.

I wish us all a very successful Croatian Student Summit and look forward to seeing you again next year.

Thank you and best regards,

Kristian Dominik Rudež

President, Student council
University of Zagreb School of Medicine

About This Year's Topic

Transplantation Medicine

Liver, pancreas, kidney, heart, lungs, cornea, skin, bone marrow, intestine… Can you imagine that all of these can be used to help another human being or to save their life? Of course, you can because you are a medical student who already heard about all of these and probably learned about the indications and contraindications for each of them. Have you ever thought about how amazing that is? Are you not impressed? Oh, and what about stool transplantation? Or transplantation of a hand or a face? Amazing!

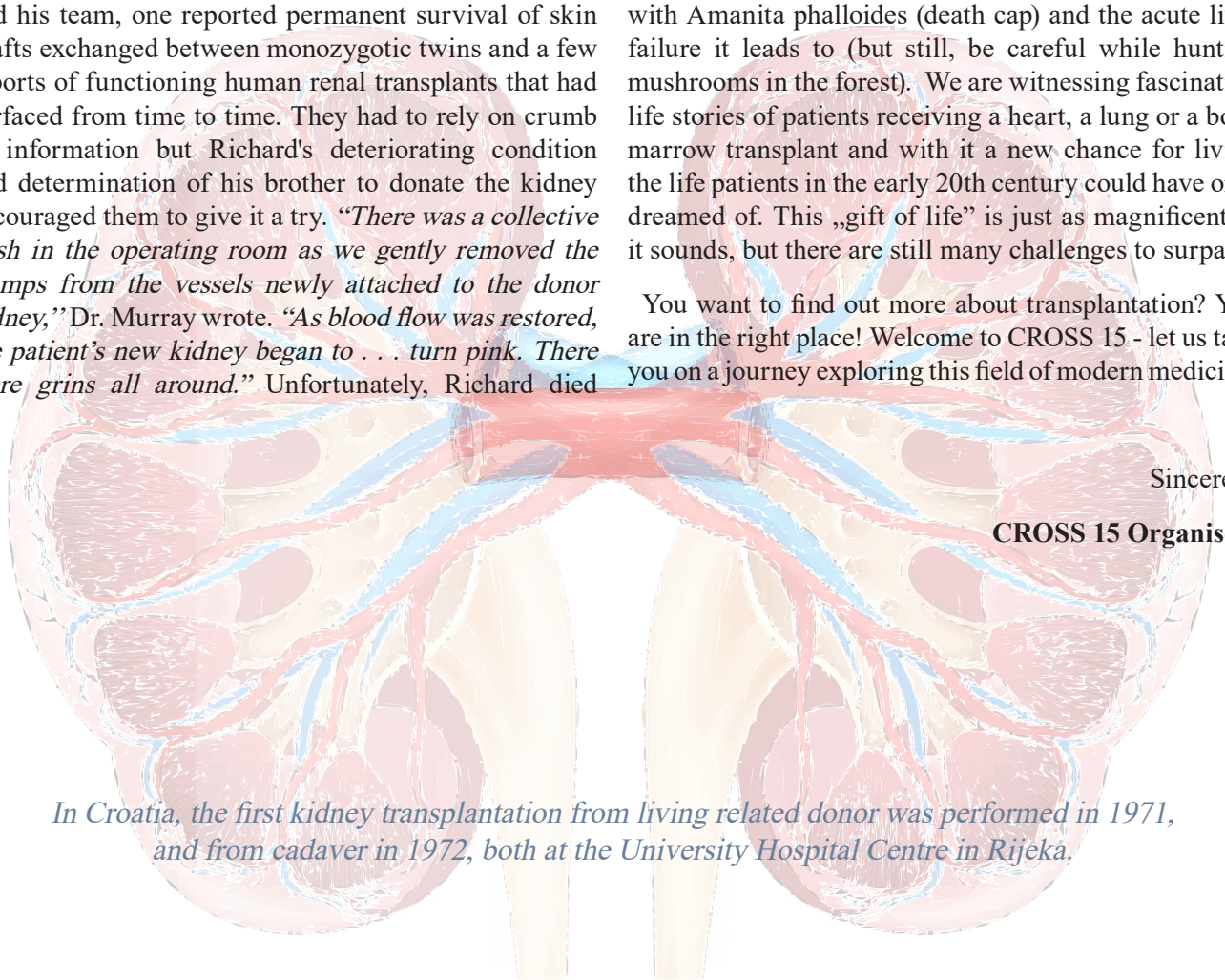
On December 23rd 1954, in the Operating Room 2 of the Peter Bent Brigham Hospital, 23-year-old Richard Herrick who was dying of chronic nephritis was lying on the operating table ready to receive a kidney from his twin brother Ronald. "Some foolish doctors", as many then thought, wanted to save this young man's life. They were led by Dr. Joseph Murray who had developed a reproducible operation through many laboratory experiments on canine renal transplantation placing the kidney in the lower abdomen. To back up their intensions, these doctors only had the feasibility of a kidney transplant in dogs shown by Dr. Murray and his team, one reported permanent survival of skin grafts exchanged between monozygotic twins and a few reports of functioning human renal transplants that had surfaced from time to time. They had to rely on crumb of information but Richard's deteriorating condition and determination of his brother to donate the kidney encouraged them to give it a try. *"There was a collective hush in the operating room as we gently removed the clamps from the vessels newly attached to the donor kidney,"* Dr. Murray wrote. *"As blood flow was restored, the patient's new kidney began to . . . turn pink. There were grins all around."* Unfortunately, Richard died of a heart attack 8 years later while his brother lived until 2010, thus being the proof that a young, healthy donor could survive with one kidney with no disability, provided the remaining kidney was not damaged. After Richard, Edith Helm travelled to Boston in 1956 to become the first woman to receive a successful transplant from her twin sister and first transplant patient to give birth, having a son and a daughter she lived until 2011! A long-term follow-up showed that 4 of the first 7 twin grafts carried out in Boston by 1961 died later of renal failure following the recurrence of nephritis in their grafts, in the absence of immunosuppression. Important medical breakthroughs such as tissue typing and immunosuppressant drugs allowed for more organ transplants and a longer survival rate for the recipients. The most notable development in this area was Jean Borel's discovery of an immunosuppressant drug in the mid-1970s. Cyclosporine was approved for commercial use in November 1983.

It has been 65 years since this first successfully preformed transplantation in humans and we are now at a place in time where it is possible to live after poisoning with Amanita phalloides (death cap) and the acute liver failure it leads to (but still, be careful while hunting mushrooms in the forest). We are witnessing fascinating life stories of patients receiving a heart, a lung or a bone marrow transplant and with it a new chance for living the life patients in the early 20th century could have only dreamed of. This „gift of life" is just as magnificent as it sounds, but there are still many challenges to surpass.

You want to find out more about transplantation? You are in the right place! Welcome to CROSS 15 - let us take you on a journey exploring this field of modern medicine!

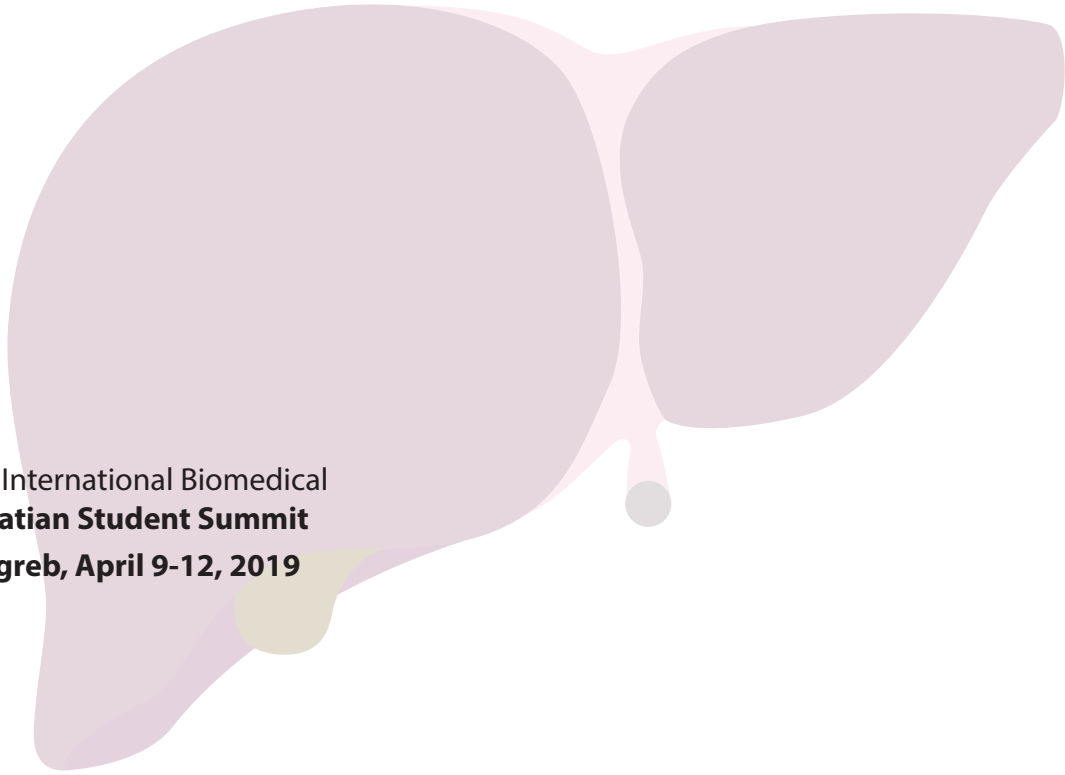
Sincerely,

CROSS 15 Organisers



In Croatia, the first kidney transplantation from living related donor was performed in 1971, and from cadaver in 1972, both at the University Hospital Centre in Rijeka.

SCIENTIFIC PROGRAM



15th International Biomedical
Croatian Student Summit
Zagreb, April 9-12, 2019

In 1963, Dr. Thomas Starzl performed the first human liver transplant. His first patient, a 3 year old boy with biliary atresia, bled to death during surgery. In 1967, he began a successful series of liver transplantation.

Tuesday
April 9, 2019

School of Medicine, Šalata 3

11:00 - 17:00

Arrival and Registration
Registration Desk in front of Čačković Hall

17:00 - 19:00

Opening Ceremony and Introductory Plenary Session
Čačković Hall

Welcome Messages
- Rector of the University of Zagreb
- Dean of School of Medicine
- President of the Croatian Medical Chamber
- President of the Student Council
- President of CROSS 15 Organising Committee

Croatian Model of Organ Donation and Transplantation
Mirela Bušić, MD

Nose2Knee - Innovative Strategy for Autologous Cartilage Transplantation
Prof. Alan Ivković, MD, PhD

19:00 - 19:40

Buffet Dinner
In front of Čačković Hall

20:00 - 22:00

Pub Quiz
Hostel Taban, Tkalčićeva Street 82

Wednesday
April 10, 2019

9:00 - 11:00

Zagreb Sightseeing Tour
Meeting point on Ban Jelačić square

School of Public Health, Rockefeller Street 4

8:00 - 10:00

Arrival and Registration

10:00 - 11:30

Poster Session 1

11:30 - 12:00

Coffee Break

12:00 - 13:30

Poster Session 2

13:30 - 14:00

Lunch Break

14:00 - 16:00

Plenary Session 1
School of Public Health A & B Hall

Challenges in Liver Transplantation
Branislav Kocman, MD

Life After Liver Transplantation
Asst. Prof. Anna Mrzljak, MD, PhD

Mechanical Circulatory Support (MCS) as an Alternative to Heart Transplantation
Asst. Prof. Igor Rudež, MD, PhD

16:00 - 19:00

Workshop Session 1

20:00 - 01:00

Gala Dinner
Rooftop Lateral, Strojarska cesta 22

AGENDA

Thursday
April 11, 2019

8:30 - 10:30

Museum Visit

School of Public Health, Rockefeller Street 4

11:00 - 13:00

Poster Session 3

13:00 - 14:00

Lunch Break

14:00 - 16:00

Plenary Session 2 and Round Table: Ethics in Transplantation Medicine

School of Public Health A & B Hall

Ethical Principles of Organ Donation
PROF. LADA ZIBAR, MD, PHD

Face Transplantation: Procedure and Ethical Considerations
ASST. PROF. EMIL DEDIOL, MD, PHD

Medical and Ethical Challenges of Uterus Transplantation
KATJA VINCE, MD

16:00 - 18:00

Workshop Session 2

21:00

Networking Event - Rakhia Bar

Tkalčićeva Street 45

Friday
April 12, 2019

9:00 - 10:00

Institute for Forensics and Criminology Museum Visit

School of Public Health, Rockefeller Street 4

9:00 - 10:30

Poster Session 4

10:30 - 11:00

Coffee Break

11:00 - 13:00

Poster Session 5

13:00 - 14:00

Lunch Break

14:00 - 16:00

Plenary Session 3

School of Public Health A & B Hall

Challenges in Kidney Transplantation
PROF. MLADEN KNOTEK, MD, PHD

Stem Cell Transplantation

The Story About CAR-T Cells
INGA MANDAC ROGULJ, MD

Stem Cell Transplantation: Patient's Story
ANA MRČIĆ

16:00 - 18:00

Workshop Session 3

23:00

After Party

HOLLYWOOD vanity club, Tuškanac 1

Invited Speakers

Mirela Bušić, MD

National Transplant Coordinator at Ministry of Health of the Republic of Croatia

Dr. Mirela Bušić, National Transplant Coordinator, has provided efficient management and sustained leadership in development of self-sufficient organ donation and transplantation system in Croatia (2001-today). She has initiated and successfully coordinated preparedness for Eurotransplant membership (2006-2007) and harmonization with European Union requirements in the SoHO field (2011). Croatia joined Eurotransplant in 2007 and has become Eurotransplant best performing country in terms of organ donation and transplantation capacities. Dr. Bušić has assisted development of organ donation and transplant systems in the South-east European countries (2011 –today).

Dr. Bušić was awarded by the Eurotransplant International Foundation for her significant contribution and exceptional work being done (Eurotransplant Award 2012). She was also acknowledged by the Transplantation Society for her great contribution in development of deceased organ donation and outstanding achievements in transplantation (The Transplantation Society Award 2012).

Croatian transplantation program nowadays represents role model and one of the best performing worldwide transplant systems. For such outstanding accomplishments dr. Mirela Bušić and all stakeholders of the National Transplantation program were honored with the Medical University Award (2018) and with the Republic of Croatia highest Award (2019).

Asst. Prof. Emil Dediol, MD, PhD

University Hospital "Dubrava", Department of Maxillofacial Surgery

Dr. Emil Dediol obtained his medical degree from Medical school of University of Zagreb in 2003. In 2013 he defended his PhD thesis also on Medical school of University of Zagreb. He specialised in maxillofacial surgery with particular interest in head and neck oncology and facial plastic surgery. During his training he was educated also in surgical departments in London and Dresden.

In the research field his main interest is oral cavity cancer with special influence on HPV in tumor carcinogenesis. He is an author of over 20 original articles in CC database. Currently he is an assistant professor on Medical school of University of Zagreb and a consultant in maxillofacial surgery in University Hospital Dubrava, Department of Maxilloafacial Surgery in Zagreb

Professor Alan Ivković, MD, PhD

University hospital "Sveti Duh", Department of Orthopaedic Surgery
School of Medicine University of Zagreb
Department of Biotechnology, University of Rijeka
University of Applied Health Sciences, Zagreb

Dr. Ivković graduated from the School of Medicine in Zagreb in 1999. His residency in orthopaedic surgery started in 2002, and he passed specialist exam in 2007. He obtained PhD degree in biomedical sciences in 2009, and the topic of his thesis was application of gene therapy in articular cartilage repair. Currently he is a consultant orthopedic surgeon at the University Hospital Sveti Duh in Zagreb. He is also assistant professor at the Department of Biotechnology University of Rijeka where he teaches regenerative medicine and tissue engineering. He also has academic affiliations with School of Medicine University of Zagreb and with faculty of Health Sciences in Zagreb. He authored numerous scientific articles published in peer-reviewed journals, as well as numerous chapters in books and encyclopedias.

As an International Fulbright Fellow he spent academic year 2007/2008 in the Center for Molecular Orthopaedics at Harvard University in Boston, USA. He is a recipient of numerous domestic and international fellowships and awards. During his career he visited numerous international teaching institutions and participated in various courses, including those in Boston, Chicago, Amsterdam, Freiburg, Munich, Barcelona, Milano and Basel.

His professional focus is adult lower extremity reconstructive surgery (including joint replacement and soft tissue surgery), as well as bone and cartilage tissue engineering. He is a team leader of the Croatian partner in the international consortium within EU FP7 project BIO-COMET (Bioreactor-based, clinically oriented engineering of tissues) and HORIZON 2020 project BIO-CHIP (Bioengineered grafts for cartilage healing in patients). He is a board member of the Croatian Orthopaedic Society and the national EBOT (European Board of Orthopaedic Surgery) delegate. As an official physician of the Croatian Water Polo Federation he participated in 2012 London Olympic Games (gold medalist), European Championships in Zagreb 2010 (gold medalist) and World Championships in Melbourne 2007 (gold medalist).

Prof. Mladen Knotek, MD, PhD

University Hospital Merkur, Department of Nephrology

Branislav Kocman, MD, PhD

Department of Surgery, Division of Transplantation Surgery, Clinical Hospital Merkur, Zagreb, Croatia

Asst. Prof. Anna Mrzljak

University Hospital Merkur, Department of Gastroenerology

Anna Mrzljak is a Consultant Gastroenterologist/Hepatologist and a Transplant physician at Liver Transplant Centre, University Hospital Merkur, Zagreb, Croatia and an assistant professor at Medical School University of Zagreb. She trained in Medicine at the University of Zagreb, where she also obtained her PhD degree in Transplantation medicine.

She was a research fellow at Institute of Liver Studies, Kings College Hospital, London, UK. Since 2016 she is a Fellow of the European Board of Gastroenterology and Hepatology and since 2013 a Fellow of the European Board of Transplant Medicine, where she currently serves as a Board Member.

Her main clinical and scientific work fields are Hepatology (viral hepatitis) and Transplantation medicine. She has participated in over 20 international clinical trials and as a PI/investigator on several national projects related to viral hepatitis, NASH and liver transplantation. She was involved in the creation of national consensus documents on viral hepatitis, and is an active member in several national and international hepatology and liver transplantation societies (ILTS, EASL, ESOT, HGD). She has authored several publications in peer-reviewed journals and mentored numerous gradate and postgraduate students.

Asst. Prof. Igor Rudež, MD, PhD

University Hospital "Dubrava", Department of Cardiac and Transplantation Surgery

Igor Rudež is a high-profile cardiac surgeon with a special area of interest in minimally invasive cardiac surgery (surgery of the beating heart without the use of an extra-corporal blood supply), aortic aneurysm surgery, valve reconstruction and heart transplantation. He is EuroTransplant's auditor for patients for emergency cardiac transplant.

He graduated from the University of Zagreb School of Medicine in 1991 and during the course of the study he was awarded twice by the Rector of the University for Best Student Research Award. Since 1992 he has been working as a research fellow at the KBC Rebro Cardiac Surgery Department. In 1994 he started his residency in general surgery at KBC Rebro. in 1996 he transferred to KB Dubrava where he finished his residency in 1999. He obtained a master's degree in natural sciences from the field of biomedicine in 1998 and a doctor of medical sciences in 2005.

On several occasions during 2001 and 2002 he was a guest surgeon at prof.dr. Hermanna Reichenspurger in Hamburg, Germany, at the University Medical Center Hamburg-Eppendorf. In 2007 he undertook the subspecialist examination of Cardiac Surgery. In 2012 he became an Assistant Professor at the University of Mostar School of Medicine. He is a lecturer at postgraduate and graduate studies at the University of Zagreb School of Medicine.

Ana Mrčić

Professor of Psychology, Stem cell transplant patient

I was born in 1967 in Zagreb. I graduated at the Faculty of Humanities and Social Sciences in Zagreb, Department of psychology. I have been a school psychologist for 25 years. The main areas of my work are prevention of unacceptable behavior, education, counseling, improving communication between students and teachers and work with gifted students.

I was an editor of the school magazine for gifted students: "I can do it!" and wrote a book about schooling in Brezovica (Zagreb). As an athlete, I organize sport competitions at school. I made some research on school communication, fear of testing and similar topics and presented them at national congresses of psychologists. I also worked on the standardization of some psychological measuring instruments.

I am an active member of Croatian Leukemia and Lymphoma society.

I enjoy studying foreign languages and can communicate in 5 languages. I am the master athlete, training and competing in triple jump. I was the World Master Champion in triple jump outdoors (Perth, 2016) in cathegory Women 45-50 years.

Inga Mandac Rogulj, MD

University Hospital Merkur, Department of Hematology

Inga Mandac Rogulj is Internal medicine and Hematology attending physician at Clinical Hospital Merkur in Zagreb. She graduaded from School of Medicine at the University of Zagreb in 2004, after receiving the Dean's award for the best student in 2004.

From 2004. to 2006. she was junior research associate at Institute of Pharmacology at School of Medicine, and in May 2006 joined the clinical faculty in the Division of Hematology at Clinical Hospital Merkur where she continues her clinical practice.

She became board certified in Internal medicine in 2010, and hematology in 2013. During the hematology fellowship programm, she spent 6-months as visiting physician and hematology fellow at Seattle Cancer Care Alliance.

Her research interest are lymphoproliferative disorders, chronic leukemias, myelodysplastic syndrome and microRNA as noninvasive diagnostic and prognostic biomarker in hematologic malignancies. Dr Mandac Rogulj has given invited lectures at domestic and international meetings and has authored numerous abstracts and scientific papers in peer-reviewed journals. She is a teaching assistant at School of Medicine in Zagreb and senior lecturer at the University of Applied Health Studies in Zagreb.

She is the member (and treasurer) of the Croatian Society of Hematology, Croatian Medical Chamber and European Hematology Association.

Katja Vince, MD

Clinical Hospital Merkur, Department of Obstetrics and Gynaecology

I was born on the 4th of July 1990 in Zagreb, Croatia. I graduated from Faculty of Medicine at University of Zagreb in 2014 and completed my internship at University Hospital Sveti Duh, Zagreb in 2015. During my studies I attended student exchange programmes in Russia and Ghana and I spent one semester at University Joseph Fourier in Grenoble, France as part of the ERASMUS student exchange programme.

In 2015 I started my residency in Obstetrics and Gynaecology at University Hospital Merkur and in 2016 I enrolled in a PhD programme "Biomedicine and Health sciences" at Faculty of Medicine, University of Zagreb.

I have authored and co-authored 14 original scientific papers and attended several international and national scientific meetings and practical courses. I am fluent in English and French.

Prof. Lada Zibar, MD, PhD

University Hospital Merkur, Department of Nephrology

President of the Committee for Medical Ethics and Deontology of Croatian Medical Chamber

Lada Zibar, MD, PhD, is professor at Medical Faculty University Josip Juraj Strossmayer in Osijek and nephrologist at Clinical Hospital „Merkur" Zagreb. She is the president of the Committee for Medical Ethics and Deontology of Croatian Medical Chamber and of the Croatian Society for Transplantation Medicine and representative of the Republic of Croatia in the Eurotransplant Ethical Committee (Netherlands).

She has been active in conferences on medical ethics and medical law, mostly within transplantation sessions. She has mentored numerous medical students researches (some in cooperation with law students) and graduation thesis in the field of transplantation medicine and ethics.

She also organizes and holds lectures for high school students and general population to popularize organ donation and transplantation and also to raise health literacy.

SCIENTIFIC PROGRAM

Basic Science

BS1 Pentadecapeptide BPC 157 counteracts portal hypertension, caval hypertension and aortal hypotension with suprahepatic occlusion of inferior caval vein in rats
Slaven Gojković, Hrvoje Vraneš, Zoya Jelovečki – Dokić, Oliver Marcel Koltay, Will Migo, Dominik Malekinušić, Borna Vrdoljak

BS2 Complications of suprahepatic inferior caval vein obstruction in rats. Pentadecapeptide BPC 157 counteracts venous thrombosis and arrhythmias
Slaven Gojković, Hrvoje Vraneš, Tajana Đurašin, Emma Orešković, Vilim Dretar, Ivan Krezić , Will Migo

BS3 Knowledge and attitudes of the Montenegrin population about transplantation
Stefan Martinović, Milivoje Đurović, Sehija Dizdarević, Milovan Roganović, Snežana Pantović

BS4 Pentadecapeptide BPC 157 Counteracts the Adverse Effects of Lithium Overdose in Rats
Filip Radevski, Zoya Jelovečki-Dokić, Marina Madunić, Slaven Gojković, Helena Žižek, Tajana Đurašin, Vilim Dretar

BS5 Pentadecapeptide BPC 157 Counteracts Hypertension and Compromised Optic Disc Circulation and Following Atrophy in Rats Subjected to High Fructose Diet
Filip Radevski , Tajana Đurašin, Pavla Perаić, Marko Belamarić, Hrvoje Vraneš, Marko Antunović, Ivan Krezić

BS6 Suprahepatic inferior caval vein occlusion induced portal and caval hypertension, aortic hypotension and esophageal bleeding. Therapy with pentadecapeptide BPC 157
Tajana Đurašin, Zoya Jelovečki – Dokić, Fry Josh, Žižek Helena, Peraić Pavla, Radveski Filip, Borna Vrdoljak

BS7 Spinal instability in rats counteracted by pentadecapeptide BPC 157
Tajana Đurašin, Pavla Peraić, Ivan Krezić, Oliver Marcel Koltay, Helena Žižek, Vilim Dretar, Slaven Gojković

BS8 Pentadecapeptide BPC 157 therapy in rats with cysteamine induced-terminal ileitis
Mariam Samara, Ivan Krezić, Marko Antunović, Marko Belamarić, Will Migo, Slaven Gojković, Vilim Dretar

BS9 Stable Gastric Pentadecapeptide BPC 157 Counteracts Convulsions Induced by Concomitant Application of Atypical Neuroleptic,SSRI and NSAID,Risperidone,Citalopram and Metamizole in Rats
Mariam Samara, Vilim Dretar, Helena Žižek, Emma Orešković, Filip Radevski

BS10 BPC 157 pentadecapepide attenuates acute renal ischemia injury, prevents ensuing hemodynamic disturbances, peaked and inverted P waves, and gastrointestinal lesions
Helena Žižek, Slaven Gojković, Tajana Đurašin, Mariam Samara, Dominik Malekinušić, Borna Vrdoljak, Marina Madunić

BS11 Splenectomy induced portal and caval hypertension, aortic hypotension, venous thrombosis, peaked p waves, and tachycardia. Therapy with pentadecapeptide BPC 157
Helena Žižek, Slaven Gojković, Zoya Jelovečki Dokić, Oliver Marcel Koltay, Marina Madunić, Tajana Đurašin, Mariam Samara

BS12 The effect of pentadecapeptide BPC 157 on high-fat diet induced hypertension in rat
Vilim Dretar, Filip Radevski, Pavla Peraić, Josh Fry, Marko Belamarić, Marko Antunović, Ivan Krezić

BS13 Complications of portal triad obstruction and reperfusion in rats. Pentadecapeptide BPC 157 counteracts venous and arterial thrombosis and arrhythmias
Vilim Dretar, Borna Vrdoljak, Emma Orešković, Oliver Marcel Koltay, Marko Antunović, Marina Madunić, Josh Fry

BS14 Pentadecapeptide BPC 157 therapy in bile duct ligated (bdl) rats
Ivan Krezić, Marko Antunović, Dominik Malekinušić, Emma Orešković, Pavla Peraić, Josh Fry, Marko Belamarić

BS15 The effect of pentadecapeptide BPC 157 on the diarrhea
Ivan Krezić, Tajana Đurašin, Will Migo, Hrvoje Vraneš, Josh Fry, Marko Antunović, Marina Madunić

BS16 Portal triad obstruction and reperfusion in rats – the effect of BPC 157
Dominik Malekinušić, Vilim Dretar, Helena Žižek, Mariam Samara, Borna Vrdoljak, Tajana Đurašin, Filip Radevski

BS17 Stable Gastric Pentadecapeptide BPC 157 in Rats with Episcleral Veins Cauterization, Glaucoma Model, Preserved Retinal and Optic Nerve Integrity
Pavla Peraić, Josh Fry, Mariam Samara, Marko Belamarić, Marina Madunić, Hrvoje Vraneš, Zoya Jelovečki-Dokić

BS18 Stable Gastric Pentadecapeptide BPC 157 Antagonized Local Anesthetic Effect of Lidocaine
Pavla Peraić, Dominik Malekinuić, Emma Orešković, Borna Vrdoljak, Filip Radevski, Josh Fry, Oliver Marcel Koltay

BS19 BPC 157 given during reperfusion counteracts portal hypertension, caval hypertension, and aortal hypotension in rats with prior portal triad obstruction
Emma Orešković, Helena Žižek, Marina Madunić, Will Migo, Marko Belamarić, Hrvoje Vraneš, Slaven Gojković

BS20 Micro and macroscopic analysis of the geniculate ganglion of the facial nerve
Šućro Madžgalj, Branko Popadić

Case Reports

CR1 A case of overlapping primary sclerosing cholangitis and autoimmune hepatitis presented as acute on chronic liver failure
Anja Stanović, Fran Vrandečić, Anna Mrzljak

CR2 Terlipressine-induced ischemic skin necrosis and malignant arrhythmia: case report
Ana Magdalena Glas, Ivana Karla Franić, Ena Janči, Stela Hrkač

CR3 Cerebral sinovenous thrombosis in children
Mateja Banović, Filip Bedenik

CR4 AV-block in patient with progressive muscle dystrophy – electrostimulation complications Case report
Boris Kos, Sara Gregurić, Vedran Velagić

CR5 Post-transplant lymphoproliferative disorder after heart transplantation
Ines Vinković, Nina Jakuš, Ivo Planinc, Jure Samardžić, Boško Skorić, Maja Čikeš, Davor Miličić

CR6 Diversity in pulmological presentations of influenza type A
Sara Gregurić, Boris Kos, Marija Gomerčić Palčić

CR7 CAGAR syndrome
Vito Bošnjak, Ana Miličević, Ingrid Prkačin

CR8 Amniotic membrane transplantation for severe ocular graft-versus-host disease following allogeneic hematopoietic stem cell transplantation
Valentina Juraga, Zinaida Perić, Ivan Škegro, Nadira Duraković, Lana Desnica, Dražen Pulanić, Radovan Vrhovac

CR9 First chicken meal in infants: why it could go wrong?
Filip Bedenik, Mateja Banović

CR10 Heart transplantation in patient with diabetes-related microvacular and macrovascular complications
Vedrana Vlahović, Dora Fabijanović, Maja Čikeš, Boško Skorić, Davor Miličić

CR11 Can Genetic counseling and Preimplantation Genetic Diagnosis prevent fatal infantile-onset Pompe disease?
Stipe Dumančić, Ana Smajo, Mario Ćuk

CR12 Inborn metabolic disorders in differential diagnosis of cyclic vomiting syndrome in children
Ana Smajo, Stipe Dumančić, Mario Ćuk

CR13 Young patient with dilatative cardiomyopathy and paroxysmal atrial fibrilation(PAF) – ablation therapy
Luka Katić, Luka Županović, Vedran Velagić

CR14 Neuroendocrine tumor – recipient or donor derived?
Lucija Franušić, Anna Mrzljak

CR15 Bile cast nephropathy after liver transplantation
Rafaela Novak, Anna Mrzljak

CR16 Non-Hodgkin's lymphoma discovered by impacted endocapsule in a stenotic small intestine - a case report
Sara Haberle, Josip Jaman, Goran Augustin

CR17 Bradykinin mediated angioedema in patient using angiotensin-converting enzyme inhibitors (ACEI) presented with swelling of upper airways and body
Ana Miličević, Vito Bošnjak, Ingrid Prkačin

CR18 Acute myocarditis in young adult following intestinal infection
Živa Štular

CR19 Van Wyk-Grumbach syndrome – rare manifestation of a common disease
Tomica Bratic, Sara Fares, Duje Braovac, Maja Vinković, Katja Dumić Kubat

CR20 Excision of subungual melanoma in situ followed by reconstruction of finger soft-tissue defect using homodigital dorsal adipofascial reverse flap
Eva Rupert, Žan Kovačič, Krešimir Bulić

CR21 Reconstruction of extension tendon and soft tissue defect on the right hand with palmaris longus and radial forearm free flap
Žan Kovačič, Eva Rupert, Krešimir Bulić

CR22 Long term treatment of de novo metastatic breast carcinoma with occult primary
Katarina Čular, Anamaria Dukić, Natalija Dedić-Plavetić

CR23 Effect of frequent ventricular ectopia on progression of dilated cardiomyopathy
Vlado-Vlaho Ćubela, Iva Galić, Ante Pašalić

CR24 Thrombopoietin receptor agonist romiplostim in refractory thrombocytopenia as a bridging therapy to the second allogeneic stem cell transplantation
Paula Kilić, Dražen Pulanić

CR25 Solitary brain metastasis of HER-2 positive breast cancer in a young premenopausal woman
Anamaria Dukić, Katarina Čular, Natalija Dedić-Plavetić

CR26 Haemophilia B case report
Antun Zvonimir Kovač

CR27 Uhl's anomaly – a rare cause of congestive heart failure
Sara Fares, Tomica Bratic, Daniel Dilber

CR28 Penetrating keratoplasty and scleral fixated artifitial iris-IOL implantation following anterior segment trauma
Filip Bosnić, Jure Buljević, Miro Kalauz

CR29 Patient involved in bicycle accident with discrete vertebral fracture
Sara Bitnec, Lenart Andrej Zore, Marijana Pervan

CR30 Patient with the foreign body and distal ileum perforation denying surgical treatment
Lenart Andrej Zore, Sara Bitenc, Marijana Pervan

CR31 Persistent left-sided pleural effusion – rare manifestation of iatrogenic pulmonary vein stenosis
Ana Kovačević, Ivona Kovačević, Marija Gomerčić-Palčić

CR32 Tinea capitis profunda with secondary bacterial infection
Manja Grašek, Matija Mozetič, Matic Sedej, Špela Grilc

CR33 Alveolar ridge augmentation using xenogenic bone graft and resorbable membrane
Nikola Matijević, Marko Matijević, Marija Pejakić, Željka Perić Kačarević

CR34 Case report: Community acquired pneumonia in young adult
Špela Grilc, Matic Sedej, Matija Mozetič

CR35 Case report: Kidney stone disease in emergency care ambulance
Špela Grilc, Manja Grašek, Barbara Zupanc

CR36 Reverse arthroplasty - alternative to conventional surgical methods in communitive proximal humerus fracture and severe rotator cuff tear
Matic Sedej, Barbara Zupanc, Špela Grilc

CR37 Deep vein thrombosis: a case report
Barbara Zupanc, Špela Grilc, Matic Sedej

CR38 Community-acquired pneumonia: a case report
Barbara Zupanc, Manja Grašek

CR39 Reconstruction and postoperative physical rehabilitation of noncontact anterior cruciate ligamentum injury from rollerblading
Matic Sedej, Barbara Zupanc, Manja Grašek

CR40 Intestinal injury due to sodium polystyrene sulfonate (SPS) treatment in a heart transplant patient
Ivor Jelavić, Boško Skorić

CR41 Septic shock after influenza infection in immunocompromised adult
Živa Štular, Monika Jevšenak Peršolja

CR42 Plaque and guttate psoriasis in a child treated with biological therapy
Manja Grašek, Špela Grilc, Barbara Zupanc

Clinical Medicine

CM1 Incidence of central diabetes insipidus in brain dead patients
Fran Rode, Marinko Vučić

CM2 The effect of Triclosan coated polyglactin 910 suture on incidence of surgical site infection in patients after colorectal operations
Fran Rašić, Branko Bakula

CM3 The Survival Rate of Lung Transplant Patients in Croatia
Tomislav Šklebar, Mateja Janković Makek, Goran Glodić, Gordana Pavliša, Ana Hećimović, Feđa Džubur, Miroslav Samaržija

CM4 Impact of ERAS protocol on patients' recovery after colorectal cancer surgery
Lucija Stojčić, Fran Rašić, Branko Bakula

CM5 Cognitive impairment prediction in patients with hypertension with Pulse Wave Velocity and arterial stiffness measurement
Varahabhatla Vamsi, Aitham Venkat Ratnam, Marina Sikorskaa, Ganna Gritsayc, Ingrid Prkacin

CM6 Hospital-acquired infections in the surgical intensive care unit
Lucija Stojčić, Fran Rašić, Branko Bakula

CM7 Effects of light pollution on students sleep quality
Dorian Laslo, Terezija Berlančić, Maja Miškulin, Ivan Miškulin

CM8 Drug Shortages in Three Randomly Selected Public Pharmacies in Montenegro
Jana Đapić, Nataša Duborija Kovačević, Benida Šahmanović, Mitar Popović, Isidora Rubežić

CM9 Non Small Cell Lung Cancer Incidence by Age and Histological Types Distribution
Isidora Rubežić, Jana Đapić, Mileta Golubović

Literature Review & Other

LR1 Comparison of guidelines for pain management in palliative patients
Sandro Gašpar, Iva Hižar

LR2 Comparison of clinical guidelines for the diagnosis and management of febrile seizures
Iva Hižar, Sandro Gašpar

LR3 Differential effect of gabapentin therapy on cognitive functions in healthy individuals
Kaja Grgić

O1 Forgotten patients – ill management of elderly patients in foster care system
Tihana Kuljiš, Ema Karmelić

Workshops

Session 1
WEDNESDAY, APRIL 10

W1 3D printing in medicine
Student society for innovations in medicine

W2 The differences between transplantation medicine in Croatia and BiH
CroMSIC Zagreb, InciSioN Croatia,
Student Section for Public Health "Andrija Štampar"

W3 Primary wound care workshop
Student surgical society

W4 Oral health and autotransplantation
Student sections School of dental medicine

Session 2
THURSDAY, APRIL 11

W5 Open fractures management and treatment workshop
Student surgical society

W6 Clinical case QUIZ
Students section for the promotion of healthy food and lifestyle

W7 Smart reading and swift publishing of clinical results and research: workshop
Student Section of Cardiology

W8 Mental health – how to take care?
CroMSIC

W9 Approach to infections in transplanted patients
Student Infectology Society

Session 3
FRIDAY, APRIL 12

W10 Testing in allergology
Student society of dermatovenereology

W11 Basal ganglia - DIY
Student society for neuroscience

W12 ORTHObasics
Student Society for Orthopaedics and Traumatology

W13 The "Blood Production" Facilities and Donorship
Student Society of Voluntary Blood Donors and Transfusion Medicine

ABSTRACTS

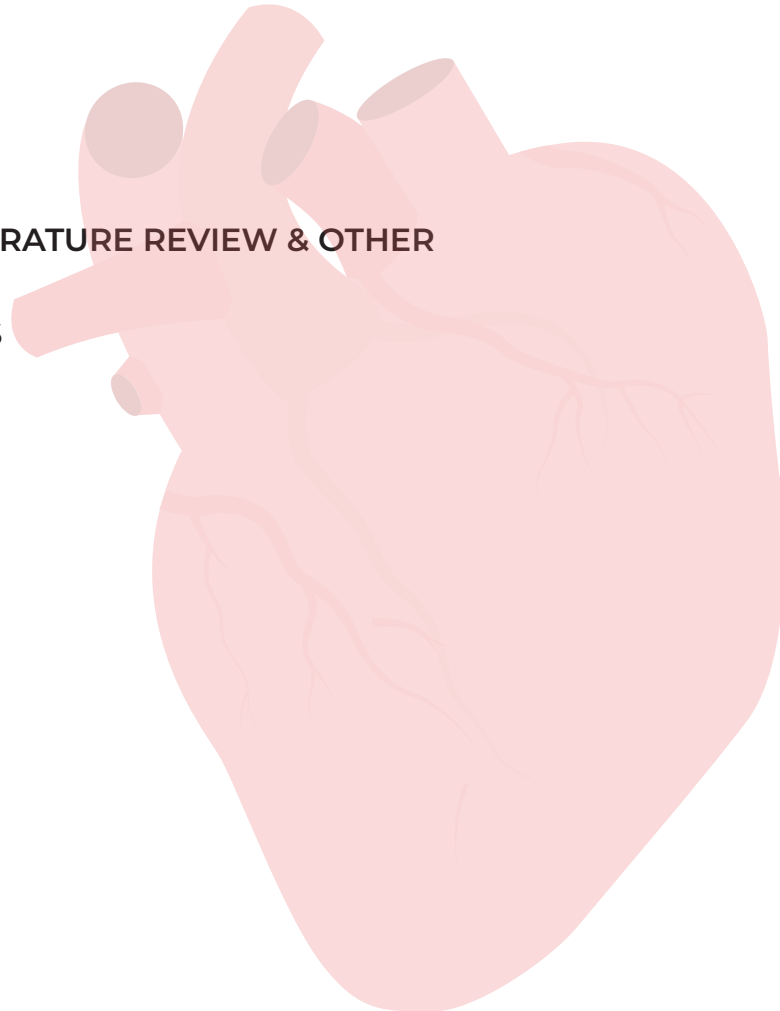
27 INVITED SPEAKERS

31 BASIC SCIENCE

41 CASE REPORTS

60 CLINICAL MEDICINE, LITERATURE REVIEW & OTHER

66 WORKSHOP INVITATIONS



15th International Biomedical
Croatian Student Summit
Zagreb, April 9-12, 2019

In 1988. Prof. Josip Sokolić performed the first heart transplant in Croatia.

ABSTRACTS

Invited Speakers

IS01
Croatian model of organ donation and transplantation
Mirela Bušić
National Transplant Coordintor at Ministry of Health

Introduction There are several key elements common to all worldwide successful organ donation and transplantation systems. Croatia has successfully exercised its implementation in a manner adapted to the local health care system's reality. Namely, only two decades ago the Croatian healthcare system had been greatly challenged by the unmet patients' needs in organ transplantation, due to organ shortage. Croatian Ministry of Health had launched a set of reforms carried out in a 10-year stepwise approach (2001-2011). Those reforms have resulted in a 10-fold increase in deceased organ transplantation rates; in 2015 Croatia reached 40 donors per million populations for the first time ever, thus ranked 1st in the world in deceased organ donation. Croatia is nowadays among the few worldwide countries with the highest capacity in terms of the provision of organ donation and transplantation services.

Public trust and altruistic donation Croatian transplantation program is grounded on principles of altruistic donation, solidarity and equity. The altruistic act of donation has been nourished for over three decades as a highly appreciated gesture of loving care for others. Over time organ donation has become widely embraced by the whole Croatian society as a valuable contribution to the community.

Appointment of Key donation persons Key donation person(s) selected among the most skilled and experienced senior intensivists have been appointed in each hospital to provide a clinical leadership and intensive care expertise in deceased organ donation pathway. That was of the utmost importance in raising overall confidence and positive attitude towards deceased organ donation amongst critical care professionals.

End of life care and Deceased Organ Donation Pathway Deceased Organ Donation Pathway reveals several critical steps that should be properly addressed along the decision making process on the medical treatment of the patient with a devastating brain injury. Identification of a patient who meets prognostic criteria for development of brain death should be followed by the timely notification of key donation person (within 6-hours). Once brain death is suspected and confirmed transition from a patient-oriented therapy to an organ-protective therapy should be facilitated under shared responsibility of critical care professionals and key donation person. Such operating protocols have been successfully implemented in all hospitals to ensure that organ donation is systematically imbedded into end-of-life practice, countrywide.

Monitoring hospital performance in deceased organ donation Effectiveness in deceased Organ Donation sets one of the benchmarks for overall quality assessment of the critical care facilities. A specific set of quality indicators for the assessment of hospitals' performance in deceased organ donation program is specified within the national quality system for transplantation program, and is the subject of the regular audits performed by the health inspection.

Fair and transparent allocation process Eurotransplant membership provides fine-tuned allocation system with a balanced exchange of organs between eight Eurotransplant member countries. Sophisticated computerised search for the best "organ match" ensures optimal management of donated organs, evidence-based and fully transparent allocation process.

Self-sufficiency The Croatian organ donation and transplantation program is comprehensively grounded on the highest professional and ethical standards that both positively reflect Croatian health-care standards and social values. Enhanced governing and clinical leadership provided in conjunction with stepwise implemented organizational measures, have effectively contributed to Croatian transplant program approaching self-sufficiency.

IS02
Nose2Knee - Innovative Strategy for Autologous Cartilage Transplantation
Alan Ivković
University hospital "Sveti Duh", Department of Orthopaedic Surgery

The restoration of damaged articular cartilage remains one of the biggest challenges in modern clinical orthopaedics. There is no pharmacological treatment that promotes the repair of the cartilage, and conservative modalities inevitably lead to the development of premature

osteoarthritis. Current treatment options include bone marrow stimulating techniques (microfracture and nanofracture), matrix-assisted autologous chondrocyte implantation (MACI), and transplantation of ostechondral grafts, each having their own benefits and shortcomings. Although effective in relieving pain and improving joint function, original versions of these modalities have failed to regenerate true hyaline cartilage, and it is necessary to introduce improvements to the existing methods, as well as to develop new and innovative approaches. In an effort to overcome limitations of currently available treatments, the Nose2Knee technology introduces two main innovations: 1) delivery of a tissue therapy as opposed to cell therapy and 2) the use of autologous nasal chondrocytes as alternative to articular chondrocytes. This brings major paradigm shift to articular cartilage repair arena, and with this particular approach we are much closer to the optimal treatment of both localized and even large-scale osteoarthritic degenerative changes in the joint.

IS03
Life After Liver Transplantation
Anna Mrzljak
University Hospital Merkur, Department of Gastroenerology

Today, the number of people surviving liver transplantation is higher than ever before and the vast majority continue to lead an active life. Liver transplant can have excellent outcomes. In general, about 70% of people who undergo liver transplant live for at least five years. Recipients have been known to live a normal life over 30 years after the operation. Long term survival is a result of rapid advance in medicine, especially in the field of pharmacology, surgery and anaesthesiology but also due to improved diagnostic procedures and therapeutic options. Transplantation is still a very complex process and remains a treatment, rather than a cure, for different liver conditions including end–stage liver disease, acute liver failure or some primary and even secondary liver tumors. Complications following transplantation can be caused by infections, recurrent diseases, such as primary sclerosing cholangitis, or cancers. Metabolic complications such as obesity, arterial hypertension and diabetes are also often observed after transplantation. Immunosuppressive therapy plays a major role in helping people living with a transplanted organ, however many of them have side effects that affect quality of life and increase morbidity and mortality. Transplant recipients directly contribute to the success of their transplant. Failure to comply with the immunosuppression medical regimen is the number one cause of organ failure. For some recipients, restraining from alcohol remains a major physical, social and/or psychological challenge to overcome. These factors, combined with the fact that the liver is such a complex and a vital organ, indicate that liver transplantation – from assessment, to the transplant itself and all the way though to the recovery period – is a unique procedure that requires a wide range of specialized health professionals (including gastroenterologists, surgeons, anesthestiologists, pathologists, radiologists, psychiatrists etc.) to help patients go back to as normal life as possible. The presentation is focused on the main complications that affect people after liver transplantation.

IS04
Mechanical Circulatory Support (MCS) as an Alternative to Heart Transplantation
Igor Rudež
University Hospital "Dubrava", Department of Cardiac Surgery

The development of heart transplantation and its introduction into modern medicine goes hand in hand with the development of various types of mechanical circulatory support systems. At the very beginning, it was the first and rather basic heart-lung machines that provided circulatory support and enabled for cardiac patients to be operated on. Very soon it was evident that the demand for organs, namely hearts, is greater that the supply, and advances in technology helped to narrow the gap. Further developments of new implantable devices look promising, but are they as good as a human heart? What is the future of heart transplantation? Is there (still) room for xeno-organs?

IS05
Ethical Principles of Organ Transplantation
Lada Zibar
University Hospital Merkur, Department of Nephrology;
Committee for Medical Ethics and Deontology of Croatian Medical Chamber

Ethics in organ transplantation (TX) is alive and variable field, determined by history, philosophy, science, medicine, law, religion, sociology and economics. The prevalent ethical problems in TX worldwide include organ shortage, donation, allocation and distributive justice, transplantation tourism and illegal transplantations. Croatia is currently almost spared of such issues and has excellent achievements in solid organ donation and TX. The outstanding legislation supports that success – the law on presumptive consent for organ donation after death (so called "opt-out" law). That means that a person should declare only if willing to be "out" of the possible donors' pool. Insufficient knowledge of the law and lack of coordination of this law with Croatian Codex of Medical Ethics and Deontology in regards to family permission for organ donation after brain death (DBD) arise as our particular ethical problem. Our law

enables only DBD donors. Donation after circulatory death (DCD) donors are present in some other countries and Croatian authorities are considering that option, as well. It is expected to have TX with organs of non-human origin in the future, like the one bred in a swine, which may raise new ethical concerns.

IS06
Face Transplantation: Procedure and Ethical Considerations
Emil Dediol
University Hospital "Dubrava", Department of Maxillofacial Surgery

Facial transplantation is the only reconstructive option available that can successfully replace lost or severely damaged central facial units such as the oral commissure, maxilla, nose and eyelids as functional outcomes with conventional reconstructive techniques invariably fall short. From 2005 till 2018 it is estimated that at least 38 facial transplantations have been performed worldwide. However, only two-thirds of all face transplants have been published in the peer-reviewed literature with details on surgical technique and clinical outcomes especially long term outcomes. Five of those patients have since died, with an apparent under-reporting in malignancy and revision surgery rates. No graft loss caused by technical failure, hyperacute, or chronic graft rejection or graft-versus-host disease has been reported. Psychological issues in candidates can include chronic pain, mood disorders, preexisting psychotic disorders, post-traumatic stress disorder (PTSD), and substance abuse. Many issues have been raised like risk versus benefit for face transplantation, a procedure intended to improve quality of life, rather than saving life. Thus, one of the most innovative surgical procedures has opened the debate on the ethical, legal, and philosophical aspects of face transplantation.

IS07
Medical and Ethical Challenges of Uterus Transplantation
Katja Vince
Clinical Hospital Merkur, Department of Obstetrics and Gynaecology

Around 1.5 million women worldwide are infertile due to absolute uterine factor (congenital or surgical absence or abnormality) and for these women uterus transplantation is the only possible method to give birth to a child.
Following two unsuccessful uterus transplantations in 2000 in Saudia Arabia and 2011 in Turkey, the first case of uterus transplantation resulting in successful childbirth was performed in 2013 in Sweden to a woman with congenital absence of uterus. Other attempts have been performed worldwide, including Germany, USA and Brazil, all with successful outcomes and acceptable medical complications. The procedure consists of multiple surgical procedures: removal of the uterus from a living or deceased donor, transplantation to the recipient, delivery by caesarean section and removal of the organ. These procedures are complex, burdened with serious intraoperative and postoperative complications such as anastomosis leakage, graft rejection, thrombosis and infection. The procedure includes prolonged exposition to immunosuppressive therapy of both mother and foetus, for whom these are possibly teratogen drugs. Pregnancies in transplanted uteri are at increased risk of adverse perinatal outcomes; mainly preterm labour and hypertensive disorders of pregnancy, but the majority of procedures performed in the past 7 years had good perinatal outcomes.
There are also unique ethical issues regarding uterus transplantation; it is the first temporary transplantation since the uterus is removed when childbearing is complete. It is not a life-saving procedure, hence all possible complications for donor and recipient accepted in other life-saving transplantations (such as kidney, heart or liver) must be re-examined and revaluated. Also, there are alternatives for women to become mothers such as adoption or surrogacy. The majority of countries worldwide do not have legal standards for this type of transplantation, nor is the uterus mentioned in informed consents for organ donations.
Even tough still an experimental procedure burdened with certain ethical dilemmas; uterus transplantation is a procedure in development and is sure to launch and inspire a lot of new perspectives and discussion in the future.

IS08
The Story About CAR-T Cells
Inga Mandac Rogulj
University Hospital Merkur, Department of Hematology

Cancer is one of the leading causes of death and one of the most important priorities worldwide is war against cancer. During the decades, number of conventional cytotoxic therapies, as well as immunotherapies and target agents have been developed. Due to their limited effectiveness in accordance with the heterogeneity of cancer cells, there is a constant search for therapeutic approaches with improved outcome, such as immunotherapy that enhances the normal capacity of the patient's immune system.

Chimeric Antigen Receptor (CAR) T-cell therapy

involves genetic modification of patient's autologous T-cells to express a CAR specific for a tumor antigen, following by ex vivo cell expansion and re-infusion back to the patient. CAR-T cells are recombinant molecules that consist of the antigen-binding variable regions of a monoclonal antibody, linked to costimulatory and activation domains of the T cell receptor (TCR) complex.

After interaction with antigen expressed on the surface of target cells, they induce T cell activation and antigen-specific effector functions, including cytolysis. CAR gene-modified T cells interact with surface antigens via antibody-derived variable domains, bypassing the requirements for antigen processing. A sample of a patient's T cells are collected from the blood, then modified to produce special structures chimeric antigen receptors (CARs) on their surface. Prior to infusion of the CAR T cells, patients may receive chemotherapy for their cancer which helps to create space in immune system for the infused CAR T cells to expand and proliferate. When these CAR T cells are reinfused into the patient, the new receptors enable them to latch onto a specific antigen on the patient's tumor cells and kill them.

Although most patients do not experience the common side effects associated with chemotherapy, there are risks of significant side effects with CAR T-cell therapy. The most common side effect of CAR T-cell therapy is called cytokine release syndrome, or CRS. It's also known as a "cytokine storm." About 70-90% of patients experience it as having a severe case of the flu, with high fever, fatigue and body aches. It's very short-term, usually starts around the second or third day after the infusion and lasts about five to seven days. The other side effect is known as "CRES," which stands for "CAR T-cell-related encephalopathy syndrome" and starts around day five after the infusion. Patients can become confused and disoriented, and sometimes may not be able to speak at all for a few days. CRES typically lasts between two and four days, and it's completely reversible. Patients eventually recover all of their neurological functions.

The most advanced clinical development is the use of CARs specific for the B-lineage marker CD19. The use of CAR T cells for the treatment of malignancy will depend both on the ability to easily manufacture the cellular product as well as the feasibility of safe administration. Despite the dramatic responses seen in hematological malignancies, toxicity management should necessarily become a focus of implementation.

IS09

Stem Cell Transplantation: Patient's Story

Ana Mrčić

I was diagnosed with thrombocytopenia (low platelet count) in 2010 and myelodysplastic syndrome (MDS) one year later. That disease was characterized by peripheral blood cytopenias (pancytopenia). The first few years I felt good in spite of the fact that I had obvious health problems: bruises, fatigue, weakness, dizziness, bleeding from the gums and nose.

Four years after diagnosis I became blood transfusion dependent. Repeated red blood cell transfusions led to iron overload.

Almost seven years after diagnosis I had allogeneic transplantation from unrelated donor. I spent 33 days in the hospital sterile unit. The ninth day after transplantation, my new bone marrow started to work. Shortly after transplantation I had acute graft-versus-host disease (GvHD): skin rash, diarrhoea, raised temperature…

Eleven months after transplantation I started to feel symptoms of chronic GvHD of my eyes, skin, joints, tendons and vaginal. In this moment, one year and nine months after transplantation I still suffer most of these symptoms.

All the time of my illness before transplantation I was training athletics and competing in European and World championships for master athletes. I was the World Master Champion in triple jump outdoors (Perth, 2016) in category Women 45-50 years. Four months after transplantation I started to train again. Chronic GvHD makes my trainings difficult, but it is much easier to train now as it was when I had only 10 platelets or haemoglobin under 60.

During my stay in hospital, I wrote a hospital diary and now I am writing a book about my life before and after transplantation.

I am an active member of Croatian Leukaemia and Lymphoma Society. Last three years I shared my experience with other patients. I think we can help each other. Doctors and patients also can learn a lot from each other. I am so grateful to blood and stem cell donors for their precious gifts to those who need them. I also want to help, so I have already organized one action of registering potential donors of stem cells in Croatian registry and I intend to organize more.

ABSTRACTS

Basic Science

BS1
Pentadecapeptide BPC 157 counteracts portal hypertension, caval hypertension and aortal hypotension with suprahepatic occlusion of inferior caval vein in rats

Slaven Gojković[a], Hrvoje Vraneš[a], Zoya Jelovečki – Dokić[a], Oliver Marcel Koltay[a], Will Migo[a], Dominik Malekinušić[a], Borna Vrdoljak[a]

[a]*Department of Pharmacology Univeristy of Zagreb School of Medicine*

Slaven Gojković 0000-0003-4020-326X, Hrvoje Vraneš 0000-0003-3544-8385, Zoya Jelovečki – Dokić 0000-0001-6758-4627, Oliver Marcel Koltay 0000-0003-3820-196X, Will Migo 0000-0002-0775-7407, Dominik Malekinušić 0000-0001-6258-5647, Borna Vrdoljak 0000-0003-2306-8799

Key words: Portal hypertension, aortal hypotension, caval hypertension

We introduce pentadecapeptide BPC 157 as the therapy of the hemodynamic disturbances in the prolonged suprahepatic occlusion of inferior caval vein (ICV) in rats mimicking Budd-Chiari syndrome. Previously, in rats with portal triad obstruction BPC 157 beneficially increased vessels branching in the intestinal serosa and counteracted intestinal lesions. It also counteracts free radical formation, and most importantly, counteracts portal hypertension and caval hypotension. In deeply anesthetized and laparatomized rats that have suprahepatic occlusion of ICV, the recording lasted 5 minutes with a cannula (assessed in one minute intervals) connected to a pressure transducer, inserted into the portal vein, inferior caval vein and abdominal aorta at the level of bifurcation, at 24 h or 48 h of ligation time. Medication (BPC 157), or saline (controls)) was applied in rats with suprahepatic occlusion of ICV, as an abdominal bath or as an intragastric application, at 24 h or 48 h reperfusion time. Assessment of portal, caval and aortal pressure showed huge portal hypertension and more caval hypertension along with mild aortic hypotension. Contrarily, when BPC 157 was given in those circumstances of the portal and caval hypertension, and arterial hypotension, these disturbances were marked counteracted. Thus, suprahepatic ICV occlusion provides high caval hypertension, even elevated in comparison to portal hypertension, and thereby, spontaneous decompression of the portal system can hardly be expected by a portocaval shunt. BPC 157, as an abdominal bath or as an intragastric application, may be a consistent therapy solution.

BS2
Complications of suprahepatic inferior caval vein obstruction in rats. pentadecapeptide BPC 157 counteracts venous thrombosis and arrhythmias

Slaven Gojković[a], Hrvoje Vraneš[a], Tajana Đurašin[a], Emma Orešković[a], Vilim Dretar[a], Ivan Krezić[a], Will Migo[a]

[a]*Department of Pharmacology University of Zagreb School of Medicine*

Slaven Gojković 0000-0003-4020-326X, Hrvoje Vraneš 0000-0003-3544-8385, Tajana Đurašin 0000-0002-6893-0875, Emma Orešković 0000-0003-4956-3181, Vilim Dretar 0000 – 0002 – 3969 – 712X, Ivan Krezić 0000-0001-7994-5645, Will Migo 0000-0002-0775-7407

Key words: Suprahepatic obstruction, venous, vena cava, arrhythmias

Pentadecapeptide BPC 157 therapy in suprahepatic inferior caval vein (ICV) obstruction, mimicking Budd Chiari syndrome in rats, 15 min, 24 h, 48 h. The counteraction of the suprahepatic inferior caval vein (ICV) obstruction (rapid cloth formation in the portal vein (PV), superior mesenteric vein (SMV), lienal vein (LV), ICV, peaked P waves, significant ST-elevation, and tachycardia; rapid bypassing shunt ICV-superior caval vein (SCV). Previously, in rats with portal triad obstruction, BPC 157 counteracted portal hypertension and caval hypotension, ICV-hypertension and aortal hypotension in rats with infrarenal ICV-occlusion as well as portal and caval hypertension in rats with short-

lasting suprahepatic occlusion of ICV. Also, BPC 157 prevents and reverses venous and arterial thrombosis. Medication (BPC 157), or saline (controls) was applied as an abdominal bath immediately after suprahepatic ICV obstruction. Suprahepatic ICV obstruction regularly produced considerable thrombosis at 15 min, 24 h and 48 h, respectively. Contrarily, in BPC 157 treated rats, the weights of the formed clots were considerably smaller: 10 μg/kg: at 15 min (0.0064±0.0008 ICV, 0.0015±0.00008 PV, 0.0009±0.00007 SMV, 0.0011±0.0008 LV); 24 h (0.00391±0.0009 ICV, 0.0056±0.00009 PV, 0.0070±0.0009 SMV, 0.0007±0.00008 LV); 48 h (0.0044±0.001 ICV, 0.0025±0.0009 PV, 0.0068±0.0009 SMV, 0.0007±0.0008 LV). Rats with suprahepatic ICV obstruction immediately exhibited peaked P waves, significant ST-elevation, and tachycardia an effect persisting till the end of the experiment. The peaked P waves, ST-elevation and tachycardia were completely absent in all BPC 157-treated rats. BPC 157 therapy counteracted the course of the thrombosis in all veins, and ECG acute right ventricular overload.

BASIC SCIENCE

BS3
Knowledge and attitudes of the Montenegrin population about transplantation

Stefan Martinović[a], Milivoje Đurović[a], Sehija Dizdarević[a], Milovan Roganović[a], Snežana Pantović[a]

[a]*University of Montenegro, Faculty of Medicine, Department of Medical Biochemistry*

Stefan Martinović 0000-0002-9211-2450, Milivoje Đurović 0000-0003-2665-8612, Sehija Dizdarević 0000-0002-2648-3034, Milovan Roganović 0000-0002-7925-7954, Snežana Pantović 0000-0003-1590-0020

Key words: transplantation, Montenegro, knowledge, attitudes

Montenegro is a country where the transplantation system is underdeveloped. The aim of this paper is to examine the knowledge and attitudes of the Montenegrin population about transplantation. The survey was conducted in January 2019 by filling the questionnaire in three Montenegrin municipalities. The results were processed using descriptive statistics. The total number of respondents was 660 (360 female and 300 male) with the average age of 53 years. The largest number of respondents are Orthodox (80%) and on 1-5 scale they rate their religiosity on average with 3.3. Almost 14% of respondents think it is possible to transplant the brain, and almost 20% of them do not know that the liver can be transplanted. Only 70% of the respondents would donate organs after death, and only 51% of them would allow the organs of the deceased member of family to be transplanted. Two-thirds of respondents have trust in doctors who deal with transplants in Montenegro, but on the other hand about 80% of respondents think that doctors would be less likely to save their life if they knew they were registered organ donors. Only 28% of respondents are sure that the list of patients waiting for a transplant is made on the principle of justice. Our results show that there is insufficient level of knowledge about transplantation among the citizens of Montenegro. Also, the level of trust in the transplantation system is not at a satisfactory level, which requires additional engagement of all those responsible in this medicine area.

BS4
Pentadecapeptide BPC 157 Counteracts the Adverse Effects of Lithium Overdose in Rats

Filip Radevski[a], Zoya Jelovečki-Dokić[a], Marina Madunić[a], Slaven Gojković[a], Helena Žižek[a], Tajana Đurašin[a], Vilim Dretar [a]

[a]*Department of Pharmacology, School of Medicine, University of Zagreb*

Filip Radevski 0000-0001-7556-1652 Zoya Jelovečki-Dokić 0000-0001-6758-4627, Marina Madunić 0000-0001-9555-3895, Slaven Gojković 0000-0003-4020-326X, Helena Žižek 0000-0001-9863-4164, Tajana Đurašin 0000-0002-6893-0875, Vilim Dretar 0000-0002-3969-712X

Key words: BPC, lithium, overdose, rats

INTRODUCTION We sought to determine whether stable gastric pentadecapeptide BPC 157 mitigates lithium intoxication in rats. METHODS: Lithium was applied at 500 mg/kg/day, intraperitoneally, once daily throughout 3 subsequent days. Medication used (in mg/kg) for the treatment group includes BPC 157 (0.01; 0.00001), L-NAME (5.0), L-arginine (100.0), applied alone and/or together, while control group rats received an equivolume of saline solution (5 mL/kg). At 20 minutes after drug application, we assessed muscular weakness (score 1-5) during the following 8 minutes. Then, for the next 5 minutes, we recorded an ECG. At 3 hours after that, the brain, the heart, the quadriceps muscle and the diaphragm muscle were used for histopathological analysis. RESULTS Consistently, lithium produced severe intoxication syndrome (muscular weakness and prostration, reduced quadriceps muscle fibers and diaphragm, myocardial infarction, and edema of various brain areas, most prominently in the cerebral cortex).

The effects worsening with subsequent applications. L-NAME and L-arginine, given separately, both induced severe aggravation. This aggravation disappeared when L-NAME and L-arginine were given together. Contrarily, when given alone or together with NO-agents, BPC 157 reduced muscular weakness and prostration and muscle damage and mitigated lithium induced myocardial damage. BPC 157 reduced nerve damage and brain edema. CONCLUSION BPC 157 could be used as therapy for lithium intoxication.

BS5
Pentadecapeptide BPC 157 Counteracts Hypertension and Compromised Optic Disc Circulation and Following Atrophy in Rats Subjected to High Fructose Diet

Filip Radevski [a], Tajana Đurašin [a], Pavla Perić [a], Marko Belamarić [a], Hrvoje Vraneš [a], Marko Antunović [a], Ivan Krezić [a]

[a] *Department of Pharmacology, School of Medicine, University of Zagreb*

Filip Radevski 0000-0001-7556-1652, Tajana Đurašin 0000-0002-6893-0875, Pavla Perić 0000-0002-1733-5443, Marko Belamarić 0000-0002-0552-8264, Hrvoje Vraneš 0000-0003-3544-8385, Marko Antunović 0000-0002-3801-5481, Ivan Krezić 0000-0001-7994-5645

Key words: BPC, hypertension, retinopathy, rats

INTRODUCTION We sought to determine whether stable gastric pentadecapeptide BPC 157 in rats subjected to a high fructose diet counteracts hypertension and compromised optic disc circulation and following atrophy. METHODS: Rats were put on a high fructose (80%) diet during a 1 month period. The treated group received BPC 157 in drinking water (10 ng/kg/rat/day). Their blood pressure was regularly measured, and they were subjected to ocular fundus examination. RESULTS At the end of the 1 month period, in control rats, with a mean blood pressure of 146 mmHg, we observed a pale optic disc with well-defined outer borders. In addition, the excavation noticed suggests compromised optic disc circulation and atrophy. Very thin arteries and thick hyperemic veins appeared, resulting in an arterial/vein diameter ratio of about 1/4. An abnormal red reflex and reduced brightness from the choroid suggests a decreased blood flow and choroidal blood filling. Contrarily, in the treated group of rats, who presented with a mean blood pressure of about 132 mmHg, all these changes were significantly attenuated. The optic disc appeared more vivid and healthier with less compromised circulation, and the arterial/vein diameter ratio was about 3/4. The choroid in rats drinking BPC 157 was brighter and with a more pronounced shade of red. CONCLUSION BPC 157 may be considered for treating hypertension, particularly when vascular obstruction is present.

BS6
Suprahepatic inferior caval vein occlusion induced portal and caval hypertension, aortic hypotension and esophageal bleeding. therapy with pentadecapeptide BPC 157

Tajana Đurašin[a], Zoya Jelovečki – Dokić [a], Fry Josh [a], Žižek Helena[a], Peraić Pavla[a], Radveski Filip[a], Borna Vrdoljak[a]

[a] *School of Medicine University of Zagreb, Department of Pharmacology*

Tajana Đurašin 0000-0002-6893-0875, Zoya Jelovečki – Dokić 0000-0001-6758-4627, Fry Josh 0000–0003–1280–7576, Žižek Helena 0000-0001-9863-4164, Peraić Pavla 0000-0002-1733-5443, Radveski Filip 0000-0001-7556-1652, Borna Vrdoljak 0000-0003-2306-8799

Key words: BPC 157, Hypotension, Hypertension, Esophageal bleeding

Pentadecapeptide BPC 157 is intraduced as therapy in a suprahepatic inferior caval vein (ICV) occlusion 15 min, 24h, 48h after complete ICV ligation. Suprahepatic ICV complications that were counteracted by BPC 157 included esophageal bleeding, severe portal and caval hypertension, and aortal hypotension. Likewise, BPC 157 counteracts the lesions in the whole GI-tract. Medication (BPC 157 (10 μg/kg, 10 ng/kg), or saline (5 ml/kg) (controls)) was applied as an abdominal bath immediately after ICV occlusion. ICV occlusion produced severe esophageal bleeding in all controls, along with microscopy findings. Contrarily, given in ischemic period, BPC 157 counteracts severe esophageal bleeding and maintained grossly intact esophageal mucosa . In rats with ICV occlusion, assessment of portal (PV), caval (ICV) and aortal (AA) pressure showed huge portal hypertension and more caval hypertension, along with mild aortic hypotension (15 min: 68±4 PV, 45±4 ICV, 73±3 AA; 24 h: 56±5 PV, 49±5 ICV, 35±3 AA; 48 h 30±3 PV, 48±5 ICV, 39±3 AA-ligation period). Contrarily, BPC 157 in rats with suprahepatic ICV occlusion markedly counteracted portal and caval hypertension, and arterial hypotension (10 μg/kg bath 15 min: 3±1 PV, 9±1 ICV, 117±5 AA; 24 h: 5±1 PV, 9±1 ICV, 67±5 AA; 48 h: 5±1 PV, 9±1 ICV, 70±6 AA), 10 ng/kg bath produced similar results. BPC 157 therapy successfully counteracts the

adverse effects of the suprahepatic ICV occlusion.

BS7
Spinal instability in rats counteracted by pentadecapeptide BPC 157

Tajana Đurašin[a], Pavla Peraić[a], Ivan Krezić[a], Oliver Marcel Koltay[a], Helena Žižek[a], Vilim Dretar[a], Slaven Gojković[a]

[a]*School of Medicine University of Zagreb, Department of Pharmacology*

Tajana Đurašin 0000-0002-6893-0875, Pavla Peraić 0000-0002-1733-5443, Ivan Krezić 0000-0001-7994-5645, Oliver Marcel Koltay 0000-0003-3820-196X, Helena Žižek 0000-0001-9863-4164, Vilim Dretar 0000–0002–3969– 712X , Slaven Gojković 0000-0003-4020-326X

Key words: spinal instability, BPC 157, facetectomy

To induce spinal instability, we focused on bilateral facetectomy in rats and possible therapeutic benefit with the stable gastric pentadecapeptide BPC 157 given in the drinking water. Male Albino Wistar rats (12 weeks aged, 350-400 g b.w.), 4 rats per group, were used in the experiment. In this study, the bilateral paravertebral muscles attached to the L3–L4 segment were peeled from the lumbar spine to expose the posterior bony elements. The rats then underwent complete resection of bilateral L3–L4 facet joints without neural tissue injuries. After that, muscle and skin incsion were closed and animals returned to cages in pairs. The medication was administrated through drinking water (BPC 157 10 ng/kg, 0.16 ng/mL, 12 ml/rat/day), while controls received drinking water only. Next eight weeks we recorded and measured paw parameters (the lenght between left and right front and back paws) in control, treated and healthy rats. Radiological analysis was also performed. The paw parametars have shown that the front paws in the control group were approximately 35% and the back paws were 13% wider than in helathy rats. Contrarily, the front paws in medicated rats were only 9% and the back paws were only 4% wider than in healthy ones. Radiological assesment of rats spines acquired at 1 week or 8 weeks was conducted and BPC 157 drinking animals had higher bone density overall. BPC 157 improves damage caused by spine instability and it can be potentially used as a treatment for chronic back pain.

BS8
Pentadecapeptide BPC 157 therapy in rats with cysteamine induced-terminal ileitis

Mariam Samara[a], Ivan Krezić[a], Marko Antunović[a], Marko Belamarić[a], Will Migo[a], Slaven Gojković[a], Vilim Dretar[a]

[a]*Department of Pharmacology, School of medicine University of Zagreb*

Mariam Samara 0000-0003-2384-273X, Ivan Krezić 0000-0001-7994-5645, Marko Antunović 0000-0002-3801-5481, Marko Belamarić 0000 - 0002 – 0552 – 8264, Will Migo 0000-0002-0775-7407, Slaven Gojković 0000-0003-4020-326, Vilim Dretar 0000 – 0002 – 3969 – 712X

Key words: cysteamine, terminal ileitis, BPC 157

We introduce pentadecapeptide BPC 157 therapy in rats with cysteamine induced-terminal ileitis 1h/1month/2months. We counteracted gross hyperemia, edema, erosion, bleeding, microscopically significant loss of villous architecture, loss and shortening of villae and severe lymphocytic infiltrate. Pentadecapeptide counteracts various lesions in the whole GI-tract and free radical formation, and tested in ulcerative colitis trials and now in multiple sclerosis. Cysteamine was known to induce gastric-acid hypersecretion as a prototype of duodenal lesion. Cysteamine induced duodenal lesions after gastrectomy, and applied as an enema, ulcerative colitis in rats Cysteamine was applied in female Albino Wistar rats into the terminal ileum, 5 cm segment up to ileocecal valve, which was kept gently compressed for 1 min, and then released. Medication(BPC, or saline (controls)) was applied as an abdominal bath immediately after the end of the cysteamine application procedure, and then if rats were not sacrificed at 1 h, continuously, perorally in drinking water till the end of 1 or 2 months The hyperemia, edema, erosion and bleeding scores were summarized. Microscopically, cysteamine induced terminal ileitis presents with: submucosal congestion, significant loss of villous architecture, loss and shortening of villae and lamina propria infiltrated with mild to severe lymphocytic infiltrate, much like intraepithelial lymphocyte infiltration and some epithelial elevation from lamina propria. Better preservation of mucosal architecture appears in pentadecapeptide treated rats. There is only mild villous edema with capillary congestion and mild lymphocytic infiltrate. No epithelial elevation from lamina propria For further therapy, beneficial effect of the BPC counteracts cysteamine-terminal ileitis.

BS9
Stable Gastric Pentadecapeptide BPC 157 Antagonized Local Anesthetic Effect of Lidocaine

Mariam Samara[a], Vilim Dretar[a], Helena Žižek[a], Emma Orešković[a], Filip Radevski[a]

[a]*School of Medicine University of Zagreb*

Mariam Samara 0000-0003-2384-273X, Vilim Dretar 0000–0002–3969–712X, Helena Žižek 0000-0001-9863-4164, Emma Orešković 0000-0003-4956-318, Filip Radevski 0000-0001-7556-165

Key words: BPC, convulsions, rats

We documented that stable gastric pentadecapeptide BPC 157 counteracts convulsions induced by concomitant application of atypical neuroleptic, SSRI and NSAID, risperidone, citalopram and metamizole in rats. BPC 157, LD1 not achieved, was implemented as an anti-ulcer peptide in inflammatory bowel disease trials and now in a multiple sclerosis trial. Previously, BPC 157 counteracts consequences of dopamine (D), receptors blockade (neuroleptics-induced catalepsy, prolonged QT intervals, sphincters dysfunction and gastric lesions), much like over-stimulation (amphetamine acute and chronic disturbances; much like Dreceptors supersensitivity (amphetamine after haloperidol)), nigrostriatal lesions (MPTP Parkinsogenic neurotoxin), D-vesicles depletion (reserpine). Similarly, BPC 157 counteracts immobility more than imipramine in depression-models (Porsolt's and chronic unpredictable stress-open field) and induces 5-HT release in particular brain areas (nigrostriatum) when given peripherally, acute and chronically. Also, BPC 157 counteracts convulsions induced by various convulsants (picrotoxine, strychnine, bicuculline) much like either with insulin or with paracetamol. we applied (mg/kg) risperidone 2.5 mg/kg, citalopram 2.0 mg/kg and metamizole 2.0 intraperitoneally. Medication (mg/kg), given 15 min before, or immediately after, includes BPC 157(0.01; 0,00001) while control rats received an equivolume of saline (5 mL/kg). Thereafter, at 20 minutes after medication risperidone/citalopram/metamizole rats became markedly sedated. Then, after the next 20 minutes they start with tonic-clonic seizures. The seizure period was lasting for the next 3 hours. Contrarily, either of BPC 157 regimens maintained normal behavior in all rats. BPC 157 exhibits also an anticonvulsant capacity, as well as a particular profile, which could in a therapy of neuroleptic, SSRI and NSAID intoxication.

BS10
BPC 157 pentadecapepide attenuates acute renal ischemia injury, prevents ensuing hemodynamic disturbances, peaked and inverted p waves, and gastrointestinal lesions

Helena Žižek[a], Slaven Gojković[a], Tajana Đurašin[a], Mariam Samara[a], Dominik Malekinušić[a], Borna Vrdoljak[a], Marina Madunić[a]

[a]*University of Zagreb, School of Medicine, Department of Pharmacology*

Helena Žižek 0000-0001-9863-4164, Slaven Gojković 0000-0003-4020-326X, Tajana Đurašin 0000-0002-6893-0875, Mariam Samara 0000-0003-2384-273X, Dominik Malekinušić 0000-0001-6258-5647, Borna Vrdoljak 0000-0003-2306-8799, Marina Madunić 0000-0001-9555-3895

Key words: renal ischemia, venous hypertension, thrombosis, gastrointestinal lesion, BPC 157

We focused on the effects of BPC 157 on acute unilateral renal ischemia in rats, subsequent severe portal (PV) and inferior vena cava (IVC) hypertension and thrombosis, abdominal aorta (AA) hypotension, peaked or inverted P waves and gastrointestinal lesions. 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 was ligated. 10min, 1h, and 24h after ligation electrocardiography, USB microcamera recording, intravascular cannulation, and thrombi extraction was performed. Control rats exhibited PV and IVC hypertension, aortic hypotension (mmHg) (10min: 32±2 PV, 24±4 IVC, 75±2 AA; 1h: 43±4 PV, 46±3 IVC, 73±4 AA; 24h: 30±2 PV, 34±1 IVC, 86±3 AA) and thrombosis (thrombus weight, mg) (10min: 1.3±0.3 IVC, 3.5±0.4 PV; 1h: 15.1±0.5 IVC, 5.4±0.2 PV; 24h: 16.3±1.5 IVC, 6.1±0.9 PV). Treated group showed improved pressure values (10min: 4±1 PV, 8±1 IVC, 84±3 AA; 1h: 18±2 PV, 6±1 IVC, 92±3 AA; 24h: 5±1 PV, 10±1 IVC, 97±2 AA) and milder thrombosis (10min: no thrombi; 1h: 7.7±0.3 IVC, 2.3±0.2 PV; 24h: 11.6±0.5 IVC, 3.2±0.2 PV). Control rats exhibited peaked (10 min, 1h) or inverted (24h) P waves, gastric and intestinal lesions (24h) and complete renal infarction (24h), whereas the treated rats exhibited no P wave abnormalities, significantly mitigated gastrointestinal lesions (24h) and only partial renal infarction (24h). BPC 157 therapy reduces the severity of renal ischemia injury, counteracts hemodynamic disturbances, P wave abnormalities and gastrointestinal lesions that follow.

BS11

Splenectomy induced portal and caval hypertension, aortic hypotension, venous thrombosis, peaked p waves, and tachycardia. therapy with pentadecapeptide BPC 157

Helena Žižek[a] , Slaven Gojković[a] , Zoya Jelovečki – Dokić[a], Oliver Marcel Koltay[a] , Marina Madunić[a], Tajana Đurašin[a], Mariam Samara[a]

[a] *University of Zagreb, School of Medicine, Department of Pharmacology*

Helena Žižek (0000-0001-9863-4164), Slaven Gojković (0000-0003-4020-326X), Zoya Jelovečki – Dokić (0000-0001-6758-4627), Oliver Marcel Koltay (0000-0003-3820-196X), Marina Madunić (0000-0001-9555-3895), Tajana Đurašin (0000-0002-6893-0875), Mariam Samara (0000-0003-2384-273X)

Key words: splenectomy, venous hypertension, congestion, thrombosis, BPC 157

We introduce BPC 157 therapy for a cluster of complications taking place after splenectomy in rats, including portal vein (PV), inferior vena cava (IVC), superior mesenteric vein (SMV) and lienal vein (LV) thrombosis, severe venous hypertension (PV, IVC), abdominal aorta (AA) hypotension, peaked P waves and tachycardia. Medication (/kg) (BPC 157 (10 μg)(treated group) or saline (5 ml)(control group)) was applied as an abdominal bath immediately after splenectomy. 10min, 3h, and 24h after splenectomy rats were assessed via electrocardiography, USB microcamera, intravascular cannulation, and thrombi extraction. Splenectomized rats exhibited PV and IVC hypertension, aortic hypotension (mmHg) (10min: 65±4 PV, 46±4 IVC, 71±3 AA; 3h: 42±4 PV, 61±4 IVC, 70±3 AA; 24h: 38±4 PV, 47±4 IVC, 68±3 AA) and thrombosis (thrombus weight, mg) (10min: 9.5±0.5 IVC, 6.6±0.9 PV, 4.8±0.9 SMV, 1.3±0.6 LV; 3h: 10.1±0.5 IVC, 5.3±0.8 PV, 19.2±0.9 SMV, 1.0±0.6 LV; 24h: 33.8±2.5 IVC, 27.5±2.9 PV, 8.8±0.9 SMV, 3.8±0.6 LV). BPC 157 normalised blood pressure (10min: 29±4 PV, 20±4 IVC, 87±3 AA; 3h: 20±4 PV, 17±4 IVC, 81±3 AA; 24h: 12±4 PV, 20±4 IVC, 82±3 AA) and reduced thrombosis (10min: 2.9±0.5 IVC, 2.6±0.9 PV, 3.2±0.3 SMV, 0.5±0.2 LV; 3h: 6.3±0.5 IVC, 2.3±0.5 PV, 5.9±0.9 SMV, 0.6±0.2 LV, 24h: 12.2±2.5 IVC, 1.9±0.5 PV, 4.8±0.9 SMV, 2.0±0.6 LV). Control group presented with peaked P waves, tachycardia and PV/SMV congestion, whereas the treated group showed none of the aforementioned phenomena. BPC 157 therapy counteracts hemodynamic disturbances, peaked P waves, and tachycardia as post-splenectomy complications.

BS12

The effect of pentadecapeptide BPC 157 on high-fat diet induced hypertension in rat

Vilim Dretar[a], Filip Radevski[a], Pavla Perаić[a], Josh Fry[a], Marko Belamarić[a], Marko Antunović[a], Ivan Krezić[a]

[a] *School of Medicine University of Zagreb, Department of Pharmacology*

Vilim Dretar (0000 – 0002 – 3969 – 712X), Filip Radevski (0000-0001-7556-1652), Pavla Perаić (0000-0002-1733-5443), Josh Fry (0000 – 0003 – 1280 - 7576), Marko Belamarić (0000 - 0002 – 0552 – 8264), Marko Antunović (0000-0002-3801-5481) , Ivan Krezić (0000-0001-7994-5645)

Key words: BPC 157, high-fat diet, hypertension, rats

Hyperlipidaemia, hypercholesterolaemia and hypertriglyceridaemia are known as factors that increas blood pressure and risk of cardiovascular complications. We wanted to examine effects of pentadecapeptide BPC 157 on high-fat diet induced hypertension in rats. 4 Male Winstar Albino rats (240g) 4 months old, were used in this study. 2 rats per each group were fed with fat (white bacon) for 4 weeks. Control group was given water p.o. ad libitum while BPC group was given (10ng/kg) of pentadecapeptide BPC 157 per liter solution p.o. ad libitum. Blood pressure was measured using noninvasive tail cuff method every day for 4 weeks period. Systolic blood pressure increased in both groups but increase in control groups was significantly higher then in BPC 157 threated group (CON day 0. = 158 mmHg, BPC day 0. = 155 mmHg; CON day 25. = 205 mmHg, BPC day 25. = 165 mmHg) .Drop of blood pressure in first few days can be attributed to adapting on the new food that was given to rats. Feeding rats with a high-fat diet is known to produce changes of which one of the consequence is increased blood pressure or hypertension. We proved that pentadecapeptide BPC 157 decreases systolic blood pressure induced by fat diet.

BS13
Complications of portal triad obstruction and reperfusion in rats. pentadecapeptide BPC 157 counteracts venous and arterial thrombosis and arrhythmias

Vilim Dretar[a], Borna Vrdoljak[a], Emma Orešković[a], Oliver Marcel Koltay[a], Marko Antunović[a], Marina Madunić[a], Josh Fry[a]

[a]*School of Medicine University of Zagreb, Department of Pharmacology*

Vilim Dretar (0000 – 0002 – 3969 – 712X) , Borna Vrdoljak (0000-0003-2306-8799), Emma Orešković (0000-0003-4956-3181), Oliver Marcel Koltay (0000-0003-3820-196X), Marko Antunović (0000-0002-3801-5481) , Marina Madunić (0000-0001-9555-3895), Josh Fry (0000 – 0003 – 1280 – 7576

Key words: BPC, Thrombosis, Arrhythmias, Obstruction

We wanted to explore effect of pentadecapeptide BPC 157 therapy in temporary portal triad obstruction (PTO) (hepatic artery (HA), portal vein (PV), bile duct occlusion for 30 min in rats), and in reperfusion period in post-PTO-period on the counteraction of the Pringle maneuver complications (cloth formation in the PV, superior mesenteric vein (SMV), lienal vein (LV), inferior caval vein (ICV) HA, peaked P wave and tachycardia). Medication (BPC 157 (10 µg/kg, 10 ng/kg), or saline (5 ml/kg) (controls)) was applied as a bath at the clamped area after portal triad clamping in rats with PTO or at the area that used to be clamped at 1 min or at 24 h reperfusion time. A period of 30 min of PTO produced thrombosis in the ICV, PV, SMV, LV and HA. In BPC 157 treated rats, the weights of the formed clots were smaller. PTO rats exhibited peaked P wave values and tachycardia which were absent in BPC 157-treated rats. Rats in post-PTO-period, during reperfusion exhibited peaked P wave values and tachycardia. Applications of BPC 157 (given at 1 min or at 24 h reperfusion time) resulted in the absence of the peaked P waves. Tachycardia was also affected; sinus rhythm appeared in a normal range of heart frequency. Confronted with Pringle maneuver and its consequences, BPC 157 therapy distinctively mitigates the whole syndrome, involving the counteraction of the course of the thrombosis in both veins and arteries, and ECG acute right ventricular overload.

BS14
Pentadecapeptide BPC 157 therapy in bile duct ligated (bdl) rats

Ivan Krezić[a], Marko Antunović[a], Dominik Malekinušić[a], Emma Orešković[a], Pavla Peraić[a], Josh Fry[a], Marko Belamarić[a]

[a]*School of Medicine Zagreb, University of Zagreb*

Ivan Krezić (0000-0001-7994-5645), Marko Antunović (0000-0002-3801-5481), Dominik Malekinušić (0000-0001-6258-5647), Emma Orešković (0000-0003-4956-3181), Pavla Peraić (0000-0002-1733-5443), Josh Fry (0000 – 0003 - 1280 - 7576), Marko Belamarić (0000 – 0002 - 0552 - 8264)

Key words: BPC 157, bile duct ligation, liver fibrosis

Pentadecapeptide BPC 157 demonstrates beneficial healing and anti-inflammatory effects on gastrointestinal and many extra - gastrointestinal tissues. Bile duct ligation causes inflammation and fibrotic changes in the liver. We wanted to explore effect of BPC 157 on bile duct ligation (BDL) in rats. Rats received BPC 157 perorally, in drinking water (0.16µg/ml, 0.16ng/ml,), or 10 µg/kg, 10 ng/kg intraperitoneally, first application at 30 min after surgery, last at 24h before sacrifice. Alternatively, delayed therapy, BPC 157 perorally, in drinking water (0.16µg/ml), started at the end of week 4 . Controls received simultaneously drinking water or an equal volume of saline (5ml/kg) intraperitoneally. At the end of the 2nd week, quantitative measurement of IL-1, IL-6 and TNF-α has been utilized using ELISA kits and NOS-3 Western Blot Analysis was performed. For assessing cell proliferation rate antibodies of monoclonal mouse Ki-67 were used at the 2, 4, 6, 8 week of BDL. Western blot analysis of NOS-3 expression in liver tissue showed that BPC 157 decreased the expression of NOS-3 protein. At 2 weeks, BDL-rat regularly exhibited the increased TNF-α, IL-6 and IL-1β liver levels but these values were counteracted with the administration of BPC 157 in drinking water. Since 2nd week until the 8th week, we noted decreased LI of Ki-67. This research shows that BPC 157 decreases hepatocyte proliferative activity, counteracts increased NOS–3 expresion, as well as increased IL-6, TNF-α, IL-1β in liver tissue.

BS15
The effect of pentadecapeptide BPC 157 on the diarrhea

Ivan Krezić[a], Tajana Đurašin[a], Will Migo[a], Hrvoje Vraneš[a], Josh Fry[a], Marko Antunović[a], Marina Madunić[a]

[a]*School of Medicine Zagreb, University of Zagreb*

Ivan Krezić (0000-0001-7994-5645), Tajana Đurašin (0000-0002-6893-0875), Will Migo (0000-0002-0775-7407), Hrvoje Vraneš (0000-0003-3544-8385), Josh Fry (0000 – 0003 – 1280 - 7576), Marko Antunović (0000-0002-3801-5481), Marina Madunić (0000-0001-9555-3895)

Key words: BPC 157, diarrhea

Pentadecapeptide BPC 157 is molecule which is used in clinical trials for bowel disease and multiple sclerosis. It shows beneficial effects on healing gastrointestinal and extra – intestinal organs (blood veseels, nervous system, bones, muscles ...). Diarrhea is large global health problem causing high morbidity and mortality. Aim of this study was to explore effect of BPC 157 on castor oil induced diarrhea. Male Albino Wistar rats (250 –300 g) were used in experiment. Rats were divided into two groups – control group and BPC treated group. At the beginning of the experiment rats were administered intragastrically castor oil. Control group was further intraperitoneally given 1 mL of saline bath and treated rats were given BPC 157 (10μg/ kg) on the same way. When treatment was performed, each rat was placed in own cage and fecal defecation was recorded by camera which was placed below cages. Quality and consistency were measured by special score made for this experiment. Results showed that in BPC treated rats normal stool formation was achieved earlier than in control rats. Results have shown that BPC 157 counteracts castor oil induced diarrhea in rats by decreasing diarrheal period and promoting normal stool formation.

BS16
Portal triad obstruction and reperfusion in rats –the effect of BPC 157

Dominik Malekinušić[a], Vilim Dretar[a] Helena Žižek[a], Mariam Samara[a], Borna Vrdoljak [a], Tajana Đurašin[a], Filip Radevski[a]

[a]*Zavod za farmakologiju, Medicinski fakultet, Sveučilište u Zagrebu*

Dominik Malekinušić (0000-0001-6258-5647), Vilim Dretar (0000 – 0002 – 3969 – 712X), Helena Žižek (0000-0001-9863-4164), Mariam Samara (0000-0003-2384-273X), Borna Vrdoljak (0000-0003-2306-8799), Tajana Đurašin (0000-0002-6893-0875) , Filip Radevski (0000-0001-7556-1652)

Key words: BPC 157, Pringle maneuvre, portal hypertension, rats

To investigate effects of pentadecapeptide BPC 157 therapy in temporary portal triad obstruction – PTO (hepatic artery, portal vein, common bile duct, 30 min in rats), and in reperfusion period thereafter, during 15 min and 24 h. BPC 157 (10 μg/kg, 10 ng/kg), or saline (5 ml/kg) was applied as a bath at the hepatoduodenal ligament area immediately after portal triad clamping or at the same area at 1 min or at 24 h reperfusion time. A period of 30 min of PTO much like reperfusion during 15 min and 24 h regularly produced severe hemorrhagic congestion (scored 0-4) of the stomach, duodenum, jejunum, cecum, colon, and esophageal bleeding in all controls. Contrarily, given either in ischemia period or in reperfusion period, BPC 157 counteracts severe hemorrhagic congestion in all organs, counteracts esophageal bleeding and maintained grossly intact esophageal mucosa. BPC 157 promptly induced effective shunting (venography in portal vein below ligation, portal vein-superior mesenteric vein-inferior mesenteric vein-rectal veins-left iliac vein-inferior caval vein). BPC 157, since attenuates portal hypertension in PTO-period, and completely eliminates pre-existing portal hypertension in post-PTO-period resulting in the values much like in the normal rats. PTO induced esophageal bleeding and severe hemorrhagic congestion in stomach, duodenum, jejunum, cecum and colon. BPC 157 counteracts these complications along with portal hypertension. Pringle maneuver and its consequences may have BPC 157 application as a successful therapy.

BS17
Stable Gastric Pentadecapeptide BPC 157 in Rats with Episcleral Veins Cauterization, Glaucoma Model, Preserved Retinal and Optic Nerve Integrity

Pavla Peraić[a], Josh Fry[a], Mariam Samara[a], Marko Belamarić[a], Marina Madunić[a], Hrvoje Vraneš[a], Zoya Jelovečki-Dokić[a]

[a]*School of Medicine University of Zagreb*

Pavla Peraić (0000000217335443), Josh Fry (0000 – 0003 – 1280 - 7576), Mariam Samara (0000-0003-2384-273X) , Marko Belamarić (0000 – 0002 – 0552 - 8264), Marina Madunić (0000-0001-9555-3895) , Hrvoje Vraneš (0000-0003-3544-8385), Zoya Jelovečki – Dokić (0000-0001-6758-4627)

Key words: PBC, glaucoma, optic

BPC 157 (LD1 not achieved) was implemented as an anti-ulcer peptide in IBD trials and now in a multiple sclerosis trial. BPC 157 maintained corneal transparency, total debridement of corneal epithelium cured with no corneal neovascularization, perforating corneal incisions in rats successfully closed and no new vessels, providing a particular healing and vascular effect. We wanted to explore effect of BPC 157 in rats with glaucoma, induced by episcleral veins cauterization. Randomly assigned operated male Wistar rats, 250g (two dorsal episcleral veins and one temporal episcleral vein isolated from the surrounding tissues; a cautery specifically applied to the selected vein), were further studied. Medication (pentadecapeptide BPC 157 (10μg/kg) (Diagen, Slovenia) intraperitoneally) or an equivolume of 0.9%NaCl (5ml/kg) intraperitoneally (controls)) was applied immediately after surgery, and then once time daily. Histopathological retinal and optic nerve samples were obtained after sacrifice at 24h, 4 and 6-weeks interval. At 24h, 4 and 6 weeks after surgery controls exhibited ganglion cell layer and optic nerve thinning. All BPC 157 rats exhibited only slight or none ganglion cell layer or optic nerve thinning. Pentadecapeptide BPC 157 continuously counteracts the effects of episcleral veins cauterization on morphological changes of ganglion cell layer and optic nerve.

BS18
Stable Gastric Pentadecapeptide BPC 157 Antagonized Local Anesthetic Effect of Lidocaine

Pavla Peraić[a], Dominik Malekinuić[a], Emma Orešković[a], Borna Vrdoljak[a], Filip Radevski[a], Josh Fry[a], Oliver Marcel Koltay[a]

[a]*School of Medicine University of Zagreb*

Pavla Peraić (0000-0002-1733-5443), Dominik Malekinušić (0000-0001-6258-5647), Emma Orešković (0000-0003-4956-3181), Borna Vrdoljak (0000-0003-2306-8799) ,Filip Radevski (0000-0001-7556-1652), Josh Fry (0000 – 0003 – 1280 - 7576) , Oliver Marcel Koltay (0000-0003-3820-196X)

Key words: BPC, lidocaine, antagonize

Pentadecapeptide BPC 157 was previously shown as a cardioprotective compound in a model of arrhythmia induced by bupivacaine toxicity where it counteracts arrhythmias and prevents lethal outcome much like in other cardiotoxicity mainly related to potassium disturbances, both hyperkalemia and hypokalemia, in vivo and in vitro. We wanted to explore does BPC 157 antagonize effect of lidocai We used Wistar Albino male rats, underwent regional blocks with lidocaine (spinal intrathecal block (lidocaine 6 mg/kg, 0.1 ml/rat, 550 gb.w.) or axillary block (lidocaine 15 mg/kg, 0.3 ml/rat, 220 g b.w.). Rats received BPC 157 (10 μg, 10 ng, 10 pg/kg intraperitoneally or intragastrically) or an equivolume of saline (5 ml/kg), either immediately or at 10 min when local anesthesia was fully established. While lidocaine application produced a prolong function failure, all BPC 157 regimens significantly shortened time to full function recovery in the conditions of full local anesthesia. In other experiments, using a hot plate (55o C for 3 minutes) when rat hind paws were infiltrated with 2% lidocaine (0.1 ml/paw), a subsequent infiltration with BPC 157 (10 μg, 10 ng, 10 pg/kg) results in the faster feet lifting and much less edema. ECG recording documented that the regimens of BPC 157 counteracted the lidocaine-induced arrhythmias. Therefore, it may be possible that BPC 157 acts as the missing antidote to local anesthethics, and potentially deleterious and even life threatening adverse effects of toxic doses of local anesthethics would be markedly attenuated or even abolished.

BS19
BPC 157 given during reperfusion counteracts portal hypertension, caval hypertension, and aortal hypotension in rats with prior portal triad obstruction

Emma Orešković[a], Helena Žižek[a], Marina Madunić[a], Will Migo[a], Marko Belamarić[a], Hrvoje Vraneš[a], Slaven Gojković[a]

[a]*School of Medicine University of Zagreb*

Emma Oreskovic (0000-0003-4956-3181), Helena Žižek (0000-0001-9863-4164), Marina Madunić (0000-0001-9555-3895), Will Migo (0000-0002-0775-7407), Marko Belamarić (0000-0002–0552-8264), Hrvoje Vraneš (0000-0003-3544-8385), Slaven Gojković (0000-0003-4020-326X)

Key words: BPC-157, Reperfusion, Portal Triad Obstruction

Reperfusion provokes major disturbances after the Pringle maneuver. We demonstrated the usefulness of the stable gastric pentadecapeptide BPC 157 as therapy for the hemodynamic disturbances after the Pringle maneuver, a temporary portal triad obstruction (PTO) (hepatic artery, portal vein, common bile duct occlusion for 30 min), with BPC 157 given during reperfusion, in the post-PTO period. In deeply anesthetized and laparatomized rats that had a PTO, the recording lasted 5 minutes with a cannula connected to a pressure transducer, inserted into the portal vein, inferior caval vein and abdominal aorta at the level of its bifurcation at 24 h of reperfusion time. BPC 157 or saline was applied as an abdominal bath in rats that had a PTO, in the post-PTO-period, at 1 min or at 24 h reperfusion time. When BPC 157 was given in circumstances of portal and caval hypertension, and arterial hypotension, disturbances were completely eliminated. This presents a potential therapeutic advantage. Thereby, whithout therapy, the pressure of both the portal and the caval system remains elevated after removal of the portal clamp. Thus, the effectiveness of the therapy, when given at distinctive points during reperfusion, appears as conclusive evidence of its efficacy. BPC 157 therapy mitigates the whole syndrome, involving the course of an even more complex model that should include rats clamped by the hepatic artery, portal vein, and bile duct vs. rats that used to have a clamped portal triad and later underwent reperfusion.

BS20
Micro and macroscopic analysis of the geniculate ganglion of the facial nerve

Šućro Madžgalj[a], Branko Popadić[b]

[a]*University of Belgrade, School of Medicine, Department for Anatomy, Deprtment for Histology*
[b]*University of Podgorica, Medical Faculty*

Šućro Madžgalj 0000-0002-7000-5697, Branko Popadić 0000-0002-1311-2592

Key words: facial nerve, geniculate ganglion, petrosal artery, clinical target

Potential clinical ambitions that are essentially based on the results of this paper, in principle, by determining the perigangliонic and intraganglionic vascular network and the clinical significance of vascularisation of geniculate ganglion in terms of possible performing more secure microsurgical procedures is the goal of this study. Blood vessels of fourteen temporal bones were studied by stereo microscopy after injecting with a mixture of India ink and gelatine in the arterial system. In addition, the histological preparations of the geniculate ganglion were painted trichromatically by Masson for the analysis of the intraganglionic vascular network. The geniculate ganglion was supplied by a petrosal artery, singular in all the specimens, except in one, where there were two of them. The mentioned originated from the middle meningeal artery (a. meningea media). A.petrosa averaged 17.1 mm in lenght. From this artery branched out approximately 1.6 branches intended for perigangliонic arterial network, whose average diameter was 0.029 mm. Microscopic section fields of the ganglion slides contained an average 99.8 microvessels. The observed characteristics of the geniculate ganglion vasculature , could be the useful base for decompressive neurovascular surgery and provides the basis for further examination of the geniculate ganglion from both the scientific and clinical aspect.

ABSTRACTS

Case Reports

CR1

A case of overlapping primary sclerosing cholangitis and autoimmune hepatitis presented as acute on chronic liver failure

Anja Stanović[a], Fran Vrandečić[a], Anna Mrzljak, Asst. Prof.[b]

[a]*School of Medicine, University of Zagreb*
[b]*Department of Gastroenterology, University Hospital Merkur*

Anja Stanović 0000-0001-7713-4187, Fran Vrandečić 0000-0003-4843-7052, Anna Mrzljak, Asst. Prof. 0000-0001-6270-2305

Key words: Acute liver failure, autoimmune hepatitis, primary sclerosing cholangitis, overlapping syndrome, multimorbidity

7-14% of patients suffering from primary sclerosing cholangitis (PSC) may present with clinical and serological features, indicating an overlap syndrome with autoimmune hepatitis (AIH). In an otherwise indolent course of a chronic liver disease, an exacerbation can result in acute liver failure (ALF). A 22-year-old man with a history of thrombotic events and verified thrombophilia (PAI-1 mutation) presented with jaundice (bilirubin=211,3 μmol/L) and abdominal discomfort. His synthetic liver function rapidly deteriorated (AST=3084 U/L, ALT=2928 U/L, ALP=154 U/L, GGT=63 U/L). Initial workup excluded viral causes and he was referred to the University Hospital Merkur with the diagnosis of ALF of unknown etiology. Whilst pursuing the underlying cause of the ALF and concomitant anaemia, the diagnosis of Crohn's disease was established via lower endoscopy. In the following days, the patient's state severely worsened, including the development of stage 3 hepatic encephalopathy. 7 days after admission, the patient was successfully transplanted. Histological assessment confirmed the diagnosis of overlapping AIH and PSC. The patient was uneventful for 2.5 years, when after the rise of liver enzymes (AST=296 U/L, ALT=682 U/L, GGT=93 U/L, ALP=165 U/L), a liver biopsy confirmed the relapse of AIH. Remission was attained with the administration of corticosteroids. In the 3-year follow-up, the patient was relapse-free without thromboembolic events. This complex case emphasizes the importance of prompt management of ALF and the difficulty of distinguishing acute on chronic liver failure from ALF. Overlapping liver diseases can be accompanied by various conditions, most commonly inflammatory bowel diseases, which makes the treatment particularly challenging.

CR2

Terlipressine-induced ischemic skin necrosis and malignant arrhythmia: case report

Ana Magdalena Glas[a], Ivana Karla Franić[a], Ena Janči[a], Stela Hrkač[a]

[a]*School of Medicine University of Zagreb*

Ana Magdalena Glas 0000-0003-3500-0126, Ivana Karla Franić 0000-0001-6762-2400, Ena Janči 0000-0001-9578-8037, Stela Hrkač 0000-0002-7623-7114

Key words: terlipressin, hepatorenal syndrome, adverse effects, skin necrosis

Terlipressine is a long-acting synthetic analogue of vasopressine used in the treatment of complications of liver cirrhosis such as hepatorenal syndrome (HRS) or variceal bleeding. Some of the most common adverse effects are abdominal cramps, headaches, bradycardia, and peripheral vasoconstriction. Despite being rare, malignant arrhythmia and skin necrosis can lead to fatal outcome. We report a female patient with HRS type 1 who received terlipressine intravenously for 7 days. Since there was no evidence of clinical improvement, on the 6th day norepinephrine was introduced as a second vasopressor. The day after the second drug was added, bullous skin changes occurred on her extremities and trunk. Those changes quickly progressed to necrosis and repetitive polymorphic VT with prolonged QTc intervals were also noted. Because of the severe adverse effects terlipressine was discontinued which led to an improvement of the skin lesions and cessation of malignant arrhythmia. Despite treatment, HRS led to multiple organ failure subsequently causing death of the patient. Although it is very effective in the treatment of HRS, terlipressine carries certain risk of side effects. Potentially lethal adverse effects are rare but nevertheless, it is important

to know them in order to be able to recognise them as soon as possible.

CR3
Cerebral sinovenous thrombosis in children

Mateja Banović[a], Filip Bedenik[a], Nina Barišić[a,b]

[a]*University of Zagreb School of Medicine*
[b]*Department of Pediatrics; University Hospital Centre Zagreb*

Mateja Banović 0000-0003-4999-6059, Filip Bedenik 0000-0002-2202-712X

Key words: CSVT, mastoiditis, anticoagulation

Cerebral sinovenous thrombosis (CSVT) is an uncommon, but extremely dangerous condition which may have lethal consequences if not recognized on time. The incidence is estimated at 0,6/100 000/year. Clinical presentation is often nonspecific and age-related, including depressed mental status, headache, vomiting, cranial nerve palsy and neonatal seizures. Diagnosis is primarily radiologic with MRV being the gold standard. Most common specific treatment is systematic anticoagulation. A 13-year-old boy presented with diplopia, bilateral 6th cranial nerve palsy and neck pain. He had an episode of acute gastroenteritis recently. Contrast-enhanced MRV revealed an intraluminal filling defects of sagittal, transversal and sigmoid sinus with partial interruption of flow, which was deemed to be an extensive thrombosis. Right mastoid showed inflammatory content, suggesting the potential etiology of the thrombosis. Ophthalmologic assessment documented papilledema. Enoxaparine was initiated and titrated to a therapeutic range. Due to inflammatory finding of the right mastoid, he was given ceftriaxone IV. Control MRV revealed partial recanalization of the sinuses after 28 days of hospitalization. After discharge, he will continue with oral anticoagulant therapy with minimum of 6 months. Mastoiditis is common cause of CSVT in pediatric population. Clinician should keep that in mind when thinking about differential diagnosis for child with sudden neurological deficit and history of acute otitis. Role of thrombolytic therapy is yet to be established. Around 90% of children with well-timed therapy have complete or partial recanalization. There is no clear correlation between recanalization and long-term prognosis.

CR4
AV-block in patient with progressive muscle dystrophy – electrostimulation complications
Case report

Boris Kos[a], Sara Gregurić[a], Vedran Velagić[b]

[a] *School of Medicine University of Zagreb*
[b]*Department of Cardiology; University Hospital Centre Zagreb*

Boris Kos 0000-0002-7798-7566, Sara Gregurić 0000-0002-2511-0543, Vedran Velagić 0000-0001-5425-5840

Key words: progressive muscular dystrophy, AV-block, opstructive ileus, electrostimulation

We report a case of total AV-block and paralytic ileus in 30-year old patient diagnosed with progressive muscular dystrophy 21 years ago. 30-year old male, diagnosed with progressive muscular dystrophy in 1998. has been in a wheelchair since 2002. Spondylodesis of thoracic spine was performed in 2005 due to scoliosis. Since 2014. patient has been using non-invasive mechanic ventilation due to respiratory failure. On 19th of February patient is diagnosed with obstructive ileus. Before the planned laparotomy, a total AV-block was diagnosed. Patient was transferred to the coronary care unit for temporary wire placement under ultrasound guidance. During the wire placement patient went to asystole, short resuscitation was performed and percutaneus pacing was placed. Interestingly percutaneus pacing did not result with voluntary muscular contractions due to severe muscle dystrophy. At last, endocardial pacing was successful and patient underwent laparotomy. Paralytic ileus was diagnosed. Postoperatively endocardial pacing was lost, again resuscitation was required along with percutaneus pacing. Therefore permanent DDDR pacemaker was implanted. Before implantation, on fluoroscopy temporary wire was visualized deep in pulmonary artery branch with multiple loops in right ventricle. This case report highlights the importance of x-ray guided endocardial lead placement in which less complications occure (RV-perforation, heart tamponade and in our case non-capture). In our case muscle weakness, respiratory failure, paralytic ileus, AV-block and treatment difficulties are all consequences of patient's muscle dystrophy. Knowing that, it must be emphasized that knowledge of pathology of progressive muscle weakness is critical in various fields of clinical medicine.

CR5
Post-transplant lymphoproliferative disorder after heart transplantation

Ines Vinković[a], Nina Jakuš[b], Ivo Planinc[b], Jure Samardžić[a,b], Boško Skorić[a,b], Maja Čikeš[a,b], Davor Miličić[a,b]

[a] *School of Medicine University of Zagreb*
[b] *Department of Cardiovascular Diseases, University Clinical Hospital Centre Zagreb*

Ines Vinković 0000-0003-1705-8295, Nina Jakuš 0000-0001-7304-1127, Ivo Planinc 0000-0003-0561-6704, Jure Samardžić 0000-0002-9346-6402, Boško Skorić 0000-0001-5979-2346, Maja Čikeš 0000-0002-4772-5549, Davor Miličić 0000-0001-9101-1570

Key words: heart transplantation, post-transplant lymphoproliferative disorder, myocarditis, toxic cardiomyopathy

Post-transplant lymphoproliferative disorder (PTLD) is a heterogeneous group of lymphoid neoplasms associated with immunosuppression following solid organ transplantation or allogeneic hematopoietic stem cell transplantation. Mismatch for cytomegalovirus (CMV), such as when a seronegative recipient receives an organ from a seropositive donor, was shown to be associated with a seven-fold increase in PTLD. A 20-year-old male patient was admitted to the hospital due to back and abdominal pain. He had underwent a heart transplant 6 years ago due to postmyocarditic dilated cardiomyopathy and soon after the transplant, he had developed CMV pneumonitis. At examination, abdominal ultrasound showed multiple lesions of the liver, and patohystology of the lesion biopsy revealed PTLD, i.e. Non-Hodgkin's diffuse large B cell lymphoma, for which the patient received 8 cycles of chemotherapy (R-CHOP protocol). Nine months after the first dose, the patient was admitted to the hospital due to simptoms of heart failure (NYHA IV) and echocardiography revealed significantly reduced cardiac function (LVEF 25%). Graft rejection was excluded with heart biopsy and it was concluded the etiology of heart failure was anthracycline (Doxorubicin) toxicity. Given the severity of the patient's condition, he was again listed for heart transplant, and ultimately, retransplanted. Eight years after the retransplant, the patient is in excellent overall condition. Heart transplant patients have about a 1- 6% risk to develop the PTLD. The incidence of chronic Doxorubicin cardiotoxicity is about 1.7%. This patient had developed both, but, fortunately, with timely and right therapy the outcome can be successful.

CR6
Diversity in pulmological presentations of influenza type A

Sara Gregurić[a], Boris Kos[a], Marija Gomerčić Palčić[b]

[a] *School of Medicine University of Zagreb*
[b] *Department of Clinical Imunology, Pulmonology and Rheumatology, The teaching hospital Sisters of Charity*

Sara Gregurić 0000-0002-2511-0543, Boris Kos 0000-0002-7798-7566, Marija Gomerčić Palčić 0000-0002-6836-4447

Key words: Influenza type A, polymyositis, NSIP

Influenza can lead to many serious complications including acute respiratory distress syndrome, sepsis and death. Cases of severe respiratory insufficiency are more likely to be connected with influenza type A. It can present as cryptogenic organizing pneumonia (COP), nonspecific interstitial pneumonia (NSIP), bronchopneumonia or acute interstitial pneumonia (AIP). Here we will present three cases of influenza infection that resulted with severe acute respiratory insufficiency but completely different radiological presentation and underlying pathophysiological mechanism. In the first case, 39-year old female developed polymyositis. Chest X-rays showed bilateral atelectasis caused by impaired mucus clearance due to muscle weakness and cough suppression. Improved muscle strength due to corticosteroid therapy along with toilet bronchoscopy resulted in normal radiological finding. Second case was a 44-year old man that presented with ARDS and later on NSIP and, in the last case, a 72-year old female initially presented with typical radiological image of NSIP characterized by consolidations and ground glass opacities. Corticosteroid therapy in all three cases led to significant regression of pathologic changes on chest-X-ray, improvement of general state and respiratory sufficiency. In Influenza type A infections everyone's concern should be pulmonary complications and possibility of evolving respiratory insufficiency. Immunomodulatory therapy such as corticosteroids positively affect the outcome of the disease and fear of bacterial superinfection or viral infection escalation is unjustified. If atelectasis is present we should always think of extrapulmonal causes such as polymyositis.

CR7
CAGAR syndrome

Vito Bošnjak[a], Ana Miličević[a], Ingrid Prkačin[a,b]

[a]*School of Medicine University of Zagreb*
[b]*Emergency Unit, Department of Internal medicine, University Hospital Merkur*

Vito Bošnjak 0000-0003-3786-0592, Ana Miličević 0000-0002-3425-8363, Ingrid Prkačin 0000-0002-5830-7131

Key words: Gitelman syndrome, CCTGA, arterial hypertension, MS

We present the patient with the combination of different genetic and autoimmune diseases:Congenitally corrected transposition of great arteries(CCTGA),Gitelman syndrome,resistant arterial hypertension and urinary retention that was the first sign of multiple sclerosis. A 54-year old female patient presented to the department of internal medicine due to hypokalaemia and hypomagnesemia when Gitelman syndrome was diagnosed.Concentrations of potassium in blood measured from 2014 to 2019 were:2.9-3.1-3.2-3.3-3.7mmol/L.She also had resistant arterial hypertension which is uncommon in Gitelman sy.,but now is successfully controlled with antihypertensive therapy. The patient also suffers from urinary retention(lower than 3 L of urine)which is an atypical clinical presentation,but it was also the first sign of multiple sclerosis.Because of urinary retention she undergo miction cystography after which low residual volume(80mL)was detected and potential diverticula were suspected.She often develops fevers up to 42°C(due to sinusitis, otitis, UTI) during witch oedema of soft tissue is observed(she gains on her weight up to 15kg),that condition is considered and treated as hyperpyrexia syndrome.A positive history of hypersensitivity to many different drugs such as penicillin,ciprofloxacin,tramadol, metoclopramide,trospium chloride,ezetimib,ivabradine, clarithromycin,pregabalin was identifited.Statin and fibrates-induced myopathy and urinary retention while taking amitriptyline and carbamazepine were also observed. Gitelman syndrome has been considered as a benign variant of salt- losing nephropathies presenting asymptomatic or with mild symptoms.This view has since been challenged by recent reports emphasizing the phenotype variability and the potential severity of the disease.This is the first case where Gitelman sy. is associated with CCTGA,resistant arterial hypertension and urinary retention which all together can be described as a CAGAR syndrome.

CR8
Amniotic membrane transplantation for severe ocular graft-versus-host disease following allogeneic hematopoietic stem cell transplantation

Valentina Juraga[a], Zinaida Perić[a,b], Ivan Škegro[c], Nadira Duraković[a,b], Lana Desnica[b], Dražen Pulanić[a,b], Radovan Vrhovac[a,b]

[a]*School of Medicine University of Zagreb*
[b]*Department of Hematology; University Hospital Centre Zagreb*
[c]*Department of Ophtalmology; University Hospital Centre Zagreb*

Valentina Juraga 0000-0003-3848-6416, Zinaida Perić 0000-0001-9458-8025, Ivan Škegro 0000-0003-2872-7351, Nadira Duraković 0000-0001-5842-0911, Lana Desnica 0000-0002-4631-0712, Dražen Pulanić 0000-0002-1177-8921, Radovan Vrhovac 0000-0003-3323-3487

Key words: allogeneic, transplantation, GVHD, ocular

Allogeneic stem cell transplantation (allo-SCT) offers cure to otherwise incurable hematologic malignancies, but can also lead to many infectious and immune complications, most importantly graft-versus-host disease (GVHD). Ocular GVHD (oGVHD) occurs in 40-60% of allo-SCT patients and can result in severe ocular surface disease causing vision impairment and deterioration of quality of life. Amniotic membrane transplantation (AMT) is an established technique in the treatment of various diseases of the ocular surface. This method could provide new options in the management of otherwise disabling severe oGVHD We describe a young female patient with myeloproliferative neoplasm who underwent allo-SCT from an unrelated donor and suffered from numerous post-transplant complications. In the early post-transplant period she developed acute skin and liver GVHD, requiring introduction of immunosupressive treatment with steroids. Steroid treatment was then complicated with miopathy, iatrogenic diabetes and many infections. She developed serious herpes virus (HSV) ophtalmitis followed by severe GVHD of the eye. Despite multiagent local therapy, oGVHD progressed to ocular ulcers with threatening corneal perforation. We hesitated from increasing systemic immunosupression due to severity of previous HSV reactivation. Therefore we decided to perform AMT which led to complete corneal healing and full clinical recovery. Moreover, there was no recurrence of severe oGVHD and the patient resumed her daily activities In conclusion, this case report serves as a foundation for further research of AMT possibilities. This procedure could become beneficial in the treatment of severe oGVHD, especially

in patients at high risk for infectious complications and contraindication for systemic immunosuppression.

CR9
First chicken meal in infants: why it could go wrong?

Filip Bedenik[a], Mateja Banović[a], Ivo Barić[a,b], Tamara Žigman[b]

[a]*University of Zagreb School of Medicine*
[b]*Department of Pediatrics; University Hospital Centre Zagreb*

Filip Bedenik 0000-0002-2202-712X, Mateja Banović 0000-0003-4999-6059

Key words: Food protein-induced enterocolitis syndrome, Ornithine transcarbamylase (OTC) deficiency, Hyperinsulinism-hyperammonemia (HI/HA) syndrome

Usual introduction time of complementary foods into infants diet is after 6 months of age. Transition from „only-milk“ diet is important for meeting growth requirements. Although importance of protein rich foods is unquestionable, there are a whole variety of potential problems which can pop up after first protein meal. We present three cases with similar clinical presentation after first protein meal, but completely different pathophysiology. A male patient presented at the age of 8 months with intense vomiting, pallor, lethargy and decreased level of consciousness less then 2 hours after consuming cooked chicken, followed by complete recovery in less than 24 hours. Suspected food allergy was confirmed and child was released two days after admission with a diagnosis of FPIES. A female infant presented at the age of 7 months with seizures accompanied with hypoglycemia, hyperammonemia and elevated liver enzymes. Episode started 30 minutes after meal rich with cooked chicken. Hypoglycemia resolved after administration of IV glucose. Suspected HI-HA syndrome was confirmed with gene testing. A 17-year old female is being followed for serum ammonia regularly because of ornithine transcarbamylase deficiency discovered in infancy. First presentation was with lethargy and hyperammonemia after first protein rich meal which contained chicken. Disease was confirmed and treatment was started with sodium phenylbutyrate, citrulline and modified diet protein intake. In a child developing symptoms after first protein meal, the importance of establishing right diagnosis cannot be emphasized enough. All potential problems can be avoided with proper diagnosis and treatment from the first presentation.

CR10
Heart transplantation in patient with diabetes-related microvacular and macrovascular complications

Vedrana Vlahović[a], Dora Fabijanović[b], Maja Čikeš[a,b], Boško Skorić[a,b], Davor Miličić[a,b]

[a]*School of Medicine University of Zagreb*
[b]*University Hospital Centre Zagreb*

Vedrana Vlahović 0000-0002-8021-4855, Dora Fabijanović 0000-0003-2633-3439, Maja Čikeš 0000-0002-4772-5549, Boško Skorić 0000-0001-5979-2346, Davor Miličić 0000-0001-9101-1570

Key words: heart transplantation, diabetes-related complications, septic shock

Cardiac transplantation is a method of choice in the treatment of patients with end-stage heart failure (HF) whose life expectancy, despite the optimal medical therapy is less than one year. Number of patiences with diabetes are increasing at alarming rates. Some studies have shown an increased risk of post-transplant infection, transplanted organ rejection, renal failure and mortality in diabetic recipients. A 38-year-old African American male patient with end-stage ischemic biventricular cardiomyopathy and diabetes mellitus type 1 with moderate chronic renal failure, was transplanted in August 2014. A few days following the transplantation his renal function continued to deteriorate and chronic haemodialysis was initiated. During the next four years, the regular heart biopsies showed no signs of acute cellular or humoral rejection and echocardiography showed normal graft function. In February 2018 the patient was listed for kidney transplantation. In April 2018 the patient presented with septic shock. Due to the severe eosinophilia combined with culture-negative severe sepsis, complete viral and parasitic serology was performed. All tests came back negative. Bone marrow aspiration showed only eosinophilia. Due to the sepsis of unknown origin, the patient was treated with broad-spectrum antibiotic therapy without an effective response to applied therapy. Despite of the all intensive care treatment, the patient died. Autopsy showed a pancarditis possibly caused by Trypanosoma cruzi or Toxoplasma gondii. In conclusion, cardiac transplantation can be performed in diabetic patients with chronic renal failure, but with significantly increased risk for further renal deterioration and even the need for chronic haemodialysis.

CR11
Can Genetic counseling and Preimplantation Genetic Diagnosis prevent fatal infantile-onset Pompe disease?

Stipe Dumančić, can. med.[a] , Ana Smajo, can. med.[a], Mario Ćuk, MD, PhD[a,b]

[a]*School of Medicine, University of Zagreb, Zagreb, Croatia*
[b]*Department of Pediatrics, Division for Genetics and Metabolic diseases, University Hospital Centre Zagreb, Zagreb, Croatia; Assistant Professor of Pediatrics, Consultant in Pediatric Endocrinology and Metabolic Medicine, Research Associate, Senior authorship and mentor*

Key words: GAA deficiency, Genetic counseling, IOPD, Pompe disease

INTRODUCTION Pompe disease (Glycogen Storage Disease Type II) is a rare, inherited, autosomal recessive disorder due to acid alpha-glucosidase (GAA) deficiency and consequent intralysosomal accumulation of glycogen in many tissues. The most severe form, classic infantile-onset Pompe disease (IOPD) is diagnosed in early infancy during the assessment of a cardiomegaly, hypotonia or both respiratory infection and failure. Without Alglucosidase-alfa enzyme replacement therapy (ERT), these patients die before two years of age. Regarding reproductive options and potential risks to offspring, it is appropriate to offer genetic counseling to adults who are carriers for Pompe disease to help them make informed medical and personal decisions. CASE PRESENTATION A 4-month-old infant was admitted to hospital because of feeding difficulties and deterioration of general status. Patient presented early with hypertrophic cardiomyopathy, hypotonia, generalized muscle weakness, failure to thrive and respiratory distress. Complete deficiency of GAA enzyme activity caused by biallelic pathogenic homozygous GAA gene mutation (c.2269C>T) proved the IOPD diagnosis with no cross reactive immunologic material (CRIM-negative status). Alglucosidase-alfa ERT and immunomodulation were introduced at age of 4 months. However, heart and skeletal muscles were severly affected and the disease progressed rapidly as might be expected with these findings. Unfortunately, the child died at the age of one year. CONCLUSION In terms of the inheritance, genetic risk, rapid progression and implications of this severe form of Pompe disease it is reasonable to try with prenatal testing and preimplantation genetic diagnosis in expert Center if both parents are fully informed and consent.

CR12
Inborn metabolic disorders in differential diagnosis of cyclic vomiting syndrome in children

Ana Smajo, can. med.[a], Stipe Dumančić, can. med.[b], Mario Ćuk, MD, PhD[a,b]

[a]*School of Medicine, University of Zagreb, Zagreb, Croatia*

[b]*Department of Pediatrics, Division for Genetics and Metabolic diseases, University Hospital Centre Zagreb, Zagreb, Croatia; Assistant Professor of Pediatrics, Consultant in Pediatric Endocrinology and Metabolic Medicine, Research Associate, Senior authorship and mentor*

Key words: cyclic vomiting syndrome; inborn errors of metabolism; gastrointestinal disturbance

INTRODUCTION Cyclic vomiting syndrome is a rare chronic disorder of unknown cause characterized by recurrent periods of frequent vomiting. The episodes are often triggered by infection and stress.Some metabolic disorders appear to hide under this clinical presentation. CASE PRESENTATION The patient is a 10-year-old girl with episodic vomiting since early childhood, born prematurely at 33 weeks and soon diagnosed with esophageal atresia with tracheoesophageal fistula which was operated the second day. Since the age of 3 she was frequently hospitalised due to episodic vomiting and poor weight gain. She underwent the Nissen fundoplication procedure at the age of 9. At the age of 10 she suffered from pneumonia accompanied by repeated vomiting episodes. Endoscopy, laboratory and radiology findings were unremarkable. Numerous infective episodes with vomiting and poor weight gain raise suspicion for metabolic etiology. The metabolic workup included several tests, all of which were negative. However, metabolic tests may not have been performed during the vomiting attack itself when they are most informative. We suggest performing metabolic tests during attacks when they are most valuable, including orotic acid in urine and allopurinol loading test to exclude urea cycle disorders. If these tests would also be negative, with persistent symptoms, we suggest OTC gene analysis. CONCLUSION The inborn errors of metabolism should be considered in the broad spectrum of differential diagnosis of recurrent vomiting in children, especially if accompanied with developmental delay, poor growth, and triggers such as infection.

CR13
Young patient with dilatative cardiomyopathy and paroxysmal atrial fibrilation(PAF) – ablation therapy

Luka Katić[a], Luka Županović[a], Vedran Velagić[b]

[a]*School of Medicine University of Zagre*
[b]*University Hospital Centre Zagreb*

Luka Katić 0000-0003-0196-4138, Luka Županović 0000-0001-5679-037X, Vedran Velagić 0000-0001-5425-5840

Key words: ablation, dilatative cardiomyopathy, paroxysmal atrial fibrilation

We report a case of patient with dilatative cardiomyopathy, implanted cardioverter defibrillator with inapropriate shocks due to fast paroxysmal atrial fibrilation treated by cryoablation of pulmonary veins. A 43 year old man was diagnosed with acute heart failure (HF) and atrial fibrillation (AF) in 07.2016. At first, he was treated with diuretic and inotrope therapy and later on converted to sinus rhythm with amiodarone.Echocardiography showed dilatative cardiomyopathy with low ejection fraction of 20%. Coronarography ruled out ischemic disease. Spiroergometry established moderly decreased functional capacity, often irregular non-sustained ventricular tachycardia. Holter ECG showed a lot of episodes of atrial fibrillation. Single chamber cardioverter defibrillator (ICD) was implanted for primary prevention of sudden cardiac death. Later on patient presented with inappropriate ICD shocks due to fast AF despite amiodarone therapy. Therefore, pulmonary vein isolation (PVI) was indicated. 4/2018 TOE excluded LAA thrombus and successful cryoablation of all pulmonary veins was performed (Picture 1). After PVI, patient did not experience further AF symptoms which was confirmed in the ICD follow up (Picture 2). Complete reduction of AF burden was verified. Furthermore, HF symptoms improved and patient was in NYHA I-II class. Ultrasound confirmed positive remodeling of LV and EF increased to 40% with marked decrease of proBNP. Amiodarone therapy was abolished. Ablation of AF prevented further inadequate shocks of ICD and increased ejection fraction (EF) from 20% to 40%. Therefore, at least partly, heart failure was tachycardia mediated (tachycardiomiopathy). Ablation and reduction of AF burden in this case has direct mortality benefit.

CR14
Neuroendocrine tumor – recipient or donor derived?

Lucija Franušić[a], Anna Mrzljak[b]

[a]*School of Medicine, University of Zagreb*
[b]*Division for Gastroenterology, Department of Internal Medicine, KB Merkur*

Lucija Franušić 0000-0002-3411-5004, Anna Mrzljak 0000-0002-3411-5004

Key words: Neuroendocrine tumor, liver, transplantation

Neuroendocrine tumors (NET) are a heterogeneous group of neoplasms with a predominant localization in the gastrointestinal tract. NET metastases within the liver represent a rare indication for liver transplantation (LT). We report a case of NET within a graft detected after liver transplantation. 49-year old male was transplanted in 10/2013 due to alcoholic liver cirrhosis with no other comorbidities. His early postoperative period was uneventful and he was discharged on triple immunosuppressive therapy. 11 days after LT, an oval hypoechogenic 15mm lesion was detected by ultrasound, localized in the left lobe of the liver. During follow-up the lesion was stable until 11 months later when abdominal MRI identified 2 hypovascular lesions (20mm and 11mm), also confirmed by MSCT and characterised as hemangiomas. 2.5 years after LT, MRI showed multiple lesions throughout the liver parenchyma which biopsy identified as NET grade II. In 9/2018. the patient was re-transplanted. Histology report showed that 60% of liver was infiltrated by NET. 5 months after reLT the patient is unremarkable with no signs of NET recurrence/dissemination. Tumors after solid organ transplantation develop as a) a recurrence/dissemination of a primary tumor, b) de novo formation or c) as donor/organ derived tumors. This case demonstrates that transplanted organs can be the primary source of tumors. Although rare, these cases have been previously described. This case also emphasizes the importance of long term follow-up after LT.

CR15
Bile cast nephropathy after liver transplantation

Rafaela Novak[a], Anna Mrzljak[a,b]

[a]School of Medicine University of Zagreb
[b]Department of Gastroenterology, University Hospital Merkur Zagreb

Rafaela Novak 0000-0001-9790-7298, Anna Mrzljak 0000-0001-6270-2305

Key words: bile cast nephropathy, liver transplantation, renal failure, hyperbilirubinemia

Bile cast nephropathy is a rare condition of renal dysfunction related to hyperbilirubinemia. The kidney injury is generally reversible if bilirubin levels are decreased early. Pathohistological findings are a result of bile casts formation and direct bile acids toxicity on renal tissue. Herein, we present a case of bile cast nephropathy after liver transplantation. A 60-year old male underwent liver transplantation (LT) in 2016 due to cryptogenic cirrhosis. Seven months after LT his liver function unexpectedly deteriorated and he developed severe jaundice (bilirubin=415 μmol/L) accompanied by acute renal failure (creatinine= 190μmol/L). A liver biopsy revealed an acute injury of unidentified aetiology, while the renal findings indicated bile cast nephropathy with nephroangiosclerosis and fibrosis. The treatment included plasmapheresis which resulted in partial recovery of renal and liver function. However, in proceeding weeks patient's liver function deteriorated (bilirubin=501 μmol/L; AST=267IU/L; ALT=503IU/L), and due to unidentified liver failure, the patient was retransplanted. His renal function partially improved with resolving hyperbilirubinemia following LT (creatinine=145μmol/L). He was discharged from the hospital with normally functioning graft and improved but still impaired kidney function. There are only a few reported cases of this condition described in the literature and aetiology of this condition is still not completely understood. The presented case report demonstrates the particular background of bile cast nephropathy and the subsequent treatment. Though, we emphasize the need for further investigations of this condition, as well as the established treatment guidelines.

CR16
Non-Hodgkin's lymphoma discovered by impacted endocapsule in a stenotic small intestine - a case report

Sara Haberle[a], Josip Jaman[a], Goran Augustin[a,b]

[a]School of Medicine University of Zagreb
[b]Department of Surgery; University Hospital Centre Zagreb

Sara Haberle 0000-0003-4759-9826, Josip Jaman 0000-0003-2281-1069, Goran Augustin 0000-0002-0202-3324

Key words: Capsule endoscopy – methods; Gastrointestinal diseases – pathology; Intestinal mucosa –pathology; Magnetic enterography – methods

Capsule endoscopy is an endoscopic method that was approved in 2001 and is used for the evaluation of mucous membranes in the small intestine. It is of special significance in cases of small intestinal pathologies that cannot be sufficiently examined and therefore diagnosed by the current gold-standards, enteroscopy and ileocolonoscopy. One major complication of capsule endoscopy is the retention of the device, which occurs in conditions that obstruct the lumen of the intestines such as inflammatory bowel disease (IBD), polyps or neoplasms. A 59-year-old patient who presented with nonspecific abdominal symptoms and a suspicion of inflammatory bowel disease received a capsule endoscopy which later became stuck due to obstruction and had to be retrieved through invasive surgical methods. The role of Magnetic enterography is constantly increasing. So far it has been recognized as a diagnostic method of choice for patients who are diagnosed with IBD or small intestinal neoplasms, especially those having complications involving intraluminal changes. Inconvenient complications exhibited by capsule endoscopy can be avoided by Magnetic enterography, moreover, it can diagnose various small intestinal pathologies more effectively.

CR17
Bradykinin mediated angioedema in patient using angiotensin-converting enzyme inhibitors (ACEI) presented with swelling of upper airways and body

Ana Miličević[a], Vito Bošnjak[a], Ingrid Prkačin[b]

[a]School of Medicine University of Zagreb
[b]Clinical Hospital Merkur, Department of Internal Medicine/Emergency Unit, Zagreb

Ana Miličević 0000-0002-3425-8363, Vito Bošnjak 0000-0003-3786-0592, Ingrid Prkačin 0000-0002-5830-7131

Key words: angioedema, bradykinin, angiotensin-converting enzyme inhibitors

We present a patient with ACEI induced angioedema after 5 years of therapy that caused not only swelling of mouth and upper airways but the whole body,which is an unusual clinical presentation. A 73-year old male patient was admitted to the emergency care unit with breathing difficulties due to the upper airway swelling that lasted for 2 hours.He had hypertension,diabetes mellitus, hypothyroidism,chronic renal disease and multiple myeloma.He had ACEI in his therapy for the last 5 years.The patient also had had swelling of the tongue 5 and 2 years ago.He was given corticosteroids and antihistamines which successfully resolved the edema,so allergic angioedema was diagnosed. This time he did not react to corticosteroids and antihistamines.Intubation was not possible due to tongue edema.Acute asphyxia occurred after 8.5 hours and emergency tracheotomy was performed.The swelling of upper airways and body continued to develop without the stabilization of clinical state.Because of suspected hereditary angioedema,a subcutaneous injection of icatibant was given as a lifesaving procedure.It caused the regression of the edema. ACEI were excluded from the therapy.After a week, blood analysis showed normal C1-inhibitor and C4 levels. Bradykinin mediated angioedema,including hereditary and ACEI induced forms,does not respond to conventional antihistamine and corticosteroid therapy. Also,they are not associated with urticaria. ACEI inhibit bradykinin degradation because angiotensin II is a key factor for the inactivation of bradykinin. Hereditary angioedema was suspected due to these severe symptoms and unusual clinical presentation. Type III hereditary angioedema with the normal level of C1-inhibitor is very rare but is considered as a differential diagnosis in our case.

CR18
Acute myocarditis in young adult following intestinal infection.

Živa Štular, dr.med.[a]

[a]*Community health center Ljubljana, Unit SNMP*

Key words: myocarditis, gastroenteritis, ECG, coronary angiography

Myocarditis describes a heterogeneous group of disorders characterized by myocardial inflammation in the absence of predominant acute or chronic ischemia. It has been reported that myocarditis occurs in ~12% of young adults, and may contribute to other myocardial diseases, such as dilated cardiomyopathy and arrhythmogenic right ventricular cardiomyopathy. A 31-year old male was admitted to ER with acute retrosternal pain that was severe enough to waken him at 5 am. He had shortness of breath after few steps and was feeling dizzy. He returned from 4-week Morocco trip 3 days prior to ER visit. During his trip he suffered from viral gastroenteritis. Physical examination was normal (BP 110/60 mmHg, heart rate 75 bpm, oxygen sat. 99%, afebrile). Family history was negative for heart disease, hypertension or diabetes. The results of the cardiac enzyme tests disclosed elevated S-troponin I Ultra level (6,107 ng/ml). There were nonspecific ST-T abnormalities in ECG. An echocardiogram showed that the patient's heart functioned normally. He underwent coronary angiography, which showed normal epicardial coronary arteries. Myocardial infarction was excluded. He was transferred to the cardiology department for further diagnosis and treatment. Based on viral infection 2 weeks prior to admission, elevated CRP and normal coronarography patient was diagnosed with viral myocarditis. The patient was given ACE inhibitor and beta-blockers. The patient was discharged 2 weeks later. Despite considerable progress, it remains a daunting challenge for physicians to discriminate between acute myocarditis and myocardial infarction, particularly in the early phase.

CR19
Van Wyk-Grumbach syndrome – rare manifestation of a common disease

Tomica Bratic[a], Sara Fares[a], Duje Braovac[b], Maja Vinković[b], Katja Dumić Kubat[c]

[a]*University of Zagreb, Medical School, Zagreb, Croatia*

[b]*Department of Pediatrics, University Hospital Centre Zagreb, Croatia*

[c]*Division of Pediatric Endocrinology and Diabetes, Department of Pediatrics, University Hospital Centre Zagreb, Croatia*

INTRODUCTION Van Wyk-Grumbach syndrome (VWGS) is characterized by prolonged primary hypothyroidism, isosexual precocious pseudopuberty, delayed bone age with either enlarged multicystic ovaries in girls or enlarged testes in boys. Pathophysiology is most likely based on similarity of TSH and FSH glycoproteins and its binding to

FSH receptors leading to precocious pseudopuberty. CASE REPORT A 8.5-year old girl was referred to endocrinologist due to hypothyroidism and obesity. She experienced fatigue, weakness, weight gain and growth retardation for 1.5 years prior to referral. At the examination she was short 110 cm(-3.7 SDS), obese 40.5 kg(+1.75 SDS) with bradycardia c/p 58/min; edematous, with dry skin, thin hair and hoarse voice. Breasts were Tanner II-III, with no pubic or axillary hair. Menarche occurred at the age of 8.3 years. Labs: TSH >100 mU/L(ref. 0.5-4.7), fT4 2.6 nmol/L(ref. 9-19), FSH 3.9 IU/L(ref. 0.4-3.5), anti-TG 18 IU/mL(ref. <4.1), anti-TPO 250 IU/mL(ref. <5), LH 0.1 IU/L(ref. 0.7-2.2), E 2 62 pmol/L(ref.<37), prolactin 43.3 µg/L(ref. 4.2-23.3). Estimated bone age was 6 years. Thyroid ultrasound revealed atrophic autoimmune thyroiditis. Pelvic ultrasound showed endometrial thickening with enlarged cystic ovaries. Subsequently, she was diagnosed with VWGS and L-thyroxine substitution was introduced. After 5 months on L-thyroxine she grew 7.5 cm, lost 7 kg and was clinically euthyroid. CONCLUSION Autoimmune thyroid disease is one of the most common endocrine disorders, characterized by gradual onset and relatively mild symptoms. VWGS represents its rare complication. Early recognition of VWGS and introduction of treatment is important in order to prevent unnecessary diagnostic and surgical procedures, and achieve excellent prognosis.

CASE REPORTS

CR20
Excision of subungual melanoma in situ followed by reconstruction of finger soft-tissue defect using homodigital dorsal adipofascial reverse flap

Eva Rupert[a], Žan Kovačič[a], doc. dr. sc. Krešimir Bulić, dr. med.[b]

[a]*School of Medicine, University of Zagreb*
[b]*Department of Reconstructive and Plastic Surgery, University Hospital Centre Zagreb*

Eva Rupert 0000-0002-4522-3844, Žan Kovačič 0000-0001-5767-5859

Key words: subungual melanoma, conservative surgical treatment, homodigital dorsal adipofascial reverse flap

INTRODUCTION Subungual melanoma is a rare malignant neoplasm of melanocytes that arises from the nail matrix. In the early phase, it presents as darkened longitudinal band under nail plate (melanonychia), and can be misdiagnosed as benign nail pigmentation disorders such as nail matrix nevi or subungual lentigo. It is usually more advanced than other melanomas at the time of diagnosis and has therefore relatively poor prognosis. Wide excision with phalanx amputation was once considered the first-line therapy, but in recent years there is a trend toward a more conservative approach. CASE REPORT We present a case of a 43 y/o woman who came to our department because of subungual melanoma on her 4th finger of the left hand. A month before, her diagnosis was confirmed by a biopsy which showed acral-lentiginous subtype of melanoma in situ. Wide excision of the entire nail unit with a 5mm safety margin without bone resection was performed; followed by reconstruction of finger soft-tissue defect using homodigital dorsal adipofascial reverse flap. CONCLUSION This type of melanoma should be diagnosed and treated as soon as possible to prevent further spread to regional lymph nodes and distant organs. Conservative treatment with nonamputative wide excision of the nail unit is an important advancement from the radical surgery with amputation. The goal of this surgery is to ensure full clearance of the lesion with satisfactory preservation of hand function. Our patient was discharged home 4 days after surgery with no complications. There are no signs of recurrence or regional spread at 2-year follow-up.

CR21
Reconstruction of extension tendon and soft tissue defect on the right hand with palmaris longus and radial forearm free flap

Žan Kovačič[a], Eva Rupert[a], doc. dr. sc. Krešimir Bulić, dr. med.[b]

[a]University of Zagreb, School of Medicine
[b]Department of Reconstructive and Plastic Surgery, University Hospital Centre Zagreb, Zagreb, Croatia

Žan Kovačič 0000-0001-5767-5859, Eva Rupert 0000-0002-4522-3844

Key words: extensor tendons injuries, free flap, degloving trauma

INTRODUCTION Extensor tendons of the hand are prone to injuries due to their superficial location. Complex injuries with loss of tendon and or soft tissue cover require extensive reconstructive plastic surgery. In order to achieve good functional and aesthetic results, extensive soft tissue defects need to be reconstructed simultaneously with extensor tendon reconstruction. CASE REPORT We present a case of 32 year old male who was admitted because of traumatic injury to his right hand. He suffered open dislocation and fracture of proximal and distal phalanges of the thumb

and complicated fracture of 5th metacarpal bone with extensive extensor tendon injuries and substantial degloving of the hand dorsum. Debridement of the wound, reposition and fixation of the 1st and 5th fingers with Kirschner wires was done on the same day. After 2 days, extensor tendons of the 2nd 3rd and 4th fingers were reconstructed with palmaris longus grafts from both hands, and soft tissue defects were covered with radial forearm free flap taken from the opposite hand, which was anastomosed with radial artery and vein. CONCLUSION Extensor tendon injuries of the hand require optimal reconstruction in order to preserve their function. Even a small difference in tendon length could mean a serious limitation of the range of movement. Soft tissue reconstruction is of equal importance and a paramount for achieving a good result after tendon reconstruction. Our patient was discharged home after 1 month and 6 months after he recovered completely with full range of movement in his right hand.

CR22
Long term treatment of de novo metastatic breast carcinoma with occult primary

Katarina Čular[a], Anamaria Dukić[a], Natalija Dedić-Plavetić[b]

[a]*School of Medicine, University of Zagreb*
[b]*University Hospital Centre Zagreb, Department of Oncology*

Katarina Čular 0000-0002-0454-4270, Anamaria Dukić 0000-0002-0810-3982, Natalija Dedić-Plavetić 0000-0003-0505-4756

Key words: Advanced breast cancer, chemotherapy, hormone therapy

De novo metastatic breast carcinoma is breast cancer that has already metastasized before the initial diagnosis. Most commonly breast cancer spreads to the liver, brain, bones, and lungs. If the primary tumor is never found the cancer is labeled an occult primary. A 55-year-old woman presented with bilateral knee pain, fever, anemia and elevated inflammatory markers. MSCT showed multiple osteolytic lesions, and malignant cells were found in the bone marrow and ascites. First line treatment with paclitaxel and carboplatin was started in 06/2014. Simultaneously, pamidronate was initiated for the osteolytic lesions. After a year, it was replaced by zoledronate. Therapy success was evaluated by monitoring tumor markers, CEA, Ca125 and Ca15-3. Letrozole was chosen as next line treatment in 12/2014, because the earlier biopsy showed that the cancer was HR+, Her2/neu-. Because of new lesions in the liver, in 09/2016 letrozole was replaced with tamoxifen. An increase in tumor markers in 02/2018 prompted the next lines of treatment, first with fulvestrant, 8 cycles, and afterwards, exemestane for a month. In 07/2018 she began treatment with paclitaxel, 4 cycles. Doxorubicin has been prescribed in 11/2018 as a last line treatment, to which she has been responding positively. Advanced breast cancer is a multisystem disease whose treatment is difficult and long. In this case, the patient has been undergoing treatment for 5 years. Her treatment regimen was planned in accordance with the standard guidelines for breast carcinomas with the same characteristics, as if the primary tumor had been found in the breast.

CR23
Effect of frequent ventricular ectopia on progression of dilated cardiomyopathy

Vlado-Vlaho Ćubela[a], Iva Galić[b], Ante Pašalić[c]

[a]*Clinical Hospital Mostar*
[b]*School of Medicine, University of Zagreb*
[c]*Clinical Hospital Sveti Duh*

Vlado-Vlaho Ćubela 0000-0002-5664-1873, Iva Galić 0000-0001-5596-0808, Ante Pašalić 0000-0001-5989-6495

Key words: Dilated cardiomyopathy, ventricular tachycardia, ablation

Dilated cardiomyopathy (DCM) is the most common form of cardiomyopathy. Various conditions may result in DCM, most commonly ischemic heart disease, metabolic/infiltrative diseases and genetic disorders. There are approximately 50 different genes known that cause DCM. Most affected genes are TTN that encode titin. DCM may lead to various rhythmic disorders, especially sustained ventricular tachycardia and ventricular fibrillation. In this article we present a case of 61 years old patient with primary dilated cardiomyopathy who was addmited to our hospital due to acute heart failure. Earlier genetic analysis showed that patient has mutation for titin, protein that is responsible for passive elasticity of caridac smooth muscle cells. Due to two episodes of ventricular tachycarida the ablation was performed, after which implantable cardioverter-defibrillator (ICD) was inserted for primary prevention of further malignant ventricular tachyarrhythmias. Hemodynamic properties and poor left ventricular systolic function were corrected by using optimal medical therapy like eplerenone and sacubitril/valsartan. Patient has developed coronary heart disease and percutaneous coronary intervention was performed with stent implantation. Because of still present ventricular ectopic which lead to further

myocardial dysfunction and progression of heart failure, additional ablation is needed. Dilated cardiomyopathy is important cause of heart failure and sudden cardiac death (SCD), especially in young individuals. It is of great importance to recognize and treat it adequately, and also to detect possible cause of it. Further investigetions should be done in order to improve treatment for heart failure that will enhance left ventricular systolic function.

CR24
Thrombopoietin receptor agonist romiplostim in refractory thrombocytopenia as a bridging therapy to the second allogeneic stem cell transplantation

Paula Kilić[a,b], Dražen Pulanić[a,b]

[a]*University of Zagreb Medical School, Zagreb, Croatia*
[b]*Division of Hematology, Department of Internal Medicine, University Hospital Center Zagreb*

Paula Kilić 0000-0002-0549-3807, Dražen Pulanić 0000-0002-1177-8921

Key words: TPO receptor agonists, romiplostim, allogeneic stem cell transplantation

Thrombopoietin (TPO) receptor agonist romiplostim mimic the action of TPO and stimulate the activation, proliferation and maturation of megakaryocytes, resulting in an increase in circulating platelet counts. In this work, we present a patient with a Ph-negative chronic myeloid leukemia (CML) with refractory thrombocytopenia treated with romiplostim as a bridging therapy to the second allogeneic stem cell transplantation (alloSCT). A 56-year old male patient was diagnosed with an atypical Ph-negative CML. One year after the diagnosis he underwent alloSCT from HLA-matched unrelated donor, but had early graft rejection, with severe bleeding diathesis, anemia and thrombocytopenia refractory to transfusion therapy. In addition to daily platelet transfusions (sometimes 2 times per day), he received tranexamic acid and intravenous immunoglobulins. Since the severe thrombocytopenia persisted, romiplostim was introduced as subcutaneous once per week treatment. After two weeks of romiplostim therapy, platelet count increased and the need for platelet transfusions decresed, and he was further followed up in outpatient setting receiving romiplostim as a bridging therapy to his second alloSCT that he received latter. This work describe an unusual use of the TPO receptor agonist as a bridging therapy between two alloSCTs to treat severe refractory thrombocytopenia.

CR25
Solitary brain metastasis of HER-2 positive breast cancer in a young premenopausal woman

Anamaria Dukić[a], Katarina Čular[a], Natalija Dedić-Plavetić[b]

[a]*School of Medicine, University of Zagreb*
[b]*University Hospital Centre Zagreb, Department of Oncology*

Anamaria Dukić 0000-0002-0810-3982, Katarina Čular 0000-0002-0454-4270, Natalija Dedić-Plavetić 0000-0003-0505-4756

Key words: Advanced breast cancer, chemotherapy, radiotherapy, hormone therapy, brain metastasis

Breast cancer is the most common invasive cancer in women worldwide. It is the second leading cause of cancer death in women. Most frequently it metastasizes to the liver, lungs, bones, brain and lymph nodes. The treatment depends on the tumor's subtype, including hormone receptor status, such as estrogen and progesterone and HER2 status. Furthermore, it depends on the stage of the tumor, genomic markers, patient's age, general health, and menopausal status. The patient is a 31-year old female who was diagnosed with invasive breast cancer and underwent surgery at the end of 2015. PHD showed an invasive cancer with estrogen and progesterone receptor positivity of 70%, Her2+ luminal B and T2N1M0. She was treated with adjuvant chemotherapy with doxorubicin and cyclophosphamide, along with pegfilgrastim, paclitaxel and transtuzumab. Afterwards, she had radiotherapy, 50Gy in 25 fractions. Next, she got adjuvant hormone therapy with tamoxifen and goserelin, later replaced by exemestane. In 2017, she had endometrial hyperplasia and underwent curettage. Because of metrorrhagia she had hysteroscopy with polypectomy and myomectomy. At the beginning of 2019, she had severe headaches so MSCT was done. She was diagnosed with metastatic brain tumor in the right parietal lobe, Her2+ and ER and PR negative. The patient is now recovering from brain surgery and stereotactic radiosurgery is being considered. Solitary brain metastasis without visceral metastases requires a specialized management approach. Systemic therapy is continued, and local treatment is added, resection followed by radiotherapy.

CR26
Haemophilia B case report

Antun Zvonimir Kovač[a]

[a]*School of Medicine University of Zagreb*

Antun Zvonimir Kovač 0000-0001-6276-4450

Key words: haemophilia, IX, coagulopathy, haemorrhage

INTRODUCTION Haemophilia B (Christmas disease) is a rare genetic coagulopathy. It is caused by deficiency of coagulation factor IX due to inherited mutation of gene located on X chromosome. Disease commonly affects male population and its presentation depends on severity of clotting protein shortage. It is usually diagnosed in early age and manifests itself with easy bruising and delayed after-trauma bleeding in joints, muscle or other tissues. CASE REPORT One-year-old boy was admitted into emergency unit for bleeding from mouth cavity and febrile state. He was born on term, hypotonic with parietal cephalohaematoma and Apgar score 9/9. In first few months, he had suffered intraventricular haemorrhage (IVH) grade II and his tests had shown prolonged activated partial thromboplastin time (aPTT). At admission he became somnolent with poor reflexes (GCS 10), irritable and crying. He had sunset eyes sign and his heart rate intermittently decreased (75 bpm). Pupils were isochoric and normally reactive. Emergency head CT showed intracranial suprasellar and prepontine haemorrhage, and hydrocephalus. CT angiography showed no vascular abnormalities. External ventricular drain was implanted. Heteroanamnesis revealed that patient had slight head trauma one day before hospitalization. He had knee bruises and his post-vaccination bleedings were long-lasting. Blood tests showed increased thrombocyte count and prolonged aPTT. He had a low concentration of factor IX and haemophilia B was diagnosed. DISCUSSION AND CONCLUSION Bleeding diatheses are due to vascular, platelet or coagulation factor defects. Although rare, haemophilia B should be considered as cause of bleeding in differential diagnosis.

CR27
Uhl's anomaly- a rare cause of congestive heart failure

Sara Fares[a] , Tomica Bratic[a], Daniel Dilber[b]

[a]*University of Zagreb, Medical School, Zagreb, Croatia*
[b]*Division for Pediatric Cardiology, Department of Pediatrics, University Hospital Centre Zagreb, Croatia*

Sara Fares 0000-0002-3559-3358

INTRODUCTION Uhl's anomaly is characterized by absence of the right ventricular myocardial layer. Although it appears to be of congenital origin, etiology is still uncertain. Patients usually present with congestive heart failure. Diagnosis is generally suggested by echocardiography. Medication treatment is only palliative, but surgical methods offer etiological cure. CASE REPORT A 10-year old boy presented in 2014 with malaise, pallor, headache and dizziness followed by sudden collapse. After admission to hospital his condition progressed to cardiogenic shock and he was successfully reanimated. Diagnosis of right ventricular dilated cardiomyopathy was set by echocardiography and NMR. Uhl's anomaly and arrhythmogenic right ventricular dysplasia (ARVD) couldn't be differentiated because the parents refused myocardial biopsy. Implantation of cardioverter defibrillator was also recommended, which the parents also refused. Heart failure medications were prescribed and the patient was discharged. In the following years the patient presented several times with heart failure symptoms and was conservatively treated. In August 2018 he was put on the transplant waiting list and was hospitalized from early October because his heart function worsened with right ventricular ejection fraction of 13%. On January 4, 2019 modified bicaval cardiac transplantation was performed. Postoperatively the patient was hemodynamically stabile, and three weeks later was released from the hospital. CONCLUSION The overall incidence of heart failure in children is low, but the associated morbidity and mortality are high. Uhl's anomaly is exceedingly rare and usually presents with congestive cardiac failure. Early diagnosis and treatment are important in order to prevent life threatening complications.

CR28
Penetrating keratoplasty and scleral fixated artifitial iris-IOL implantation following anterior segment trauma

Filip Bosnić[a] , Jure Buljević[a] , Miro Kalauz[b]

[a]*School of Medicine, University of Zagreb, Šalata 3b, Zagreb, Croatia*
[b]*Department of Ophthalmology, University Hospital Center Rebro, Kišpatićeva ulica 12, Zagreb, Croatia*

INTRODUCTION Ocular trauma is a worldwide public health problem 1 ,and it´s most severe form is open- globe injury. They are a common cause of visual impairement and blindness, with a global incidence 200

000 per year 2 . Young men experience the highest rates of open globe injuries. Male to female ratio is 4:1, and 50% of ocular trauma patients are under 18 years old. Children are more exposed due to play, but can even experience ocular trauma in utero, during amniocentesis. There is a disproportion between number of injuries and eye surface; eyes make up 0.27% of body surface, 4 % of the face surface, but are injured in more than 10% of body injury cases. Eye trauma makes up for 5-10% of all hospitalisations, with intraocular foreign bodies (35%), perforative injuries (25%), non-perforative injuries (25%) and burns/adnexal injuries (15%). Recent improvements in ophthalmic instrumentation and management resulted in improved patient care, and advances in vitreoretinal surgery and newer refractive implants resulted in improved visual outcomes. This is a case report of penetrating keratoplasty and scleral fixated artifitial iris-IOL implantation following anterior segment trauma. CASE SUMMARY Our patient is a 63-year-old man with an amblyopic left eye, who had a traumatic open-globe injury of the right eye in 2011. Upon ocular examination hyphema, traumatic aniridia, luxated cataract with corneoscleral rupture were found. The eye had been primarily repaired, using 10.0 and 8.0 sutures, intracapsular cataract extraction had been performed, along with and anterior vitrectomy. In 2012., the patient had a corneal ulcus which has been treated with amniotic membrane transplant. A scleral-fixated artifitial iris intraocular lens (Ophtec USA, model 311, +20.00) has been placed and sutured with polypropylene, atraumatic suture 10/0, 16mm needle double armed. Perforative keratoplasty had also been performed, using interrupted and running suture technique. Postoperatively, the artifitial iris-IOL remained well centered. Patients visual acuity improved to best corrected visual acuity of 0.2. Patient also reported a subjective reduction in glare.

CONCLUSION Ocular trauma is common cause of ocular impairment and blindness. Male population is typically affected. This case shows that in severe cases of open globe trauma presenting with aniridia, luxated cataract and corneoscleral rupture best terapeutic option to restore visual acuity is penetrating keratoplasty and scleral fixated artifitial iris-IOL implantation. Operation resulted with adequate aesthetic effect of iris and improvment of patient´s quality of vision.

CR29
Patient involved in bicycle accident with discrete vertebral fracture

Sara Bitnec[a], Lenart Andrej Zore[b], Marijana Pervan[c]

[a]*University Clinical Centre Ljubljana, Slovenia*
[b]*University of Zagreb, Croatia*
[c]*Department of Radiology, KBC Zagreb, Croatia*

INTRODUCTION 22 years old healthy male patient came to the Emergency due to falling off the bike and having intense pain in the lower spine. X- ray imaging showed no sign of injury but due to increasing pain magnetic resonance imaging (MRI) was done and revealed revealed fracture of vertebratae. CASE DISCUSSION A patient was cycling and heavily braced down the street, after that he fell off the bike and slid down the road for few meters. He described the accident precisely and had strong pain in the area of spinous processes of lower thoracic spine and on the right side of thoracic muscles, denied breathing problems. The skin was without signs of injuries. Neurological examination showed no problems. X-ray of thorax and spine were normal. Due to increasing pain of patient MR showed fracture of the 12th vertebratae. Due to unstable spine fracture and back pain the traumatologist made posterolateral spondylodesis. Under X-ray control they implanted screws through the th9, th10, th12 and L1 pedicles and fixated on the both side with the Legacy system. CONCLUSION Despite the normal X-ray, MRI is the main diagnostic tool in the spine pathology and in the patient with persistent back pain. Clinical examination with detailed neurological status is the key in the treatment process. The best operating procedure for fractures as in our case is fixation of adjacent thoracic vertebrae. The patient recovered completely.

CR30
Patient with the foreign body and distal ileum perforation denying surgical treatment

Lenart Andrej Zore[a], Sara Bitenc[b], Marijana Pervan[c]

[a]*School of Medicine, University of Zagreb, Croatia*
[b]*University Clinical Centre Ljubljana, Slovenia*
[c]*Department of Radiology, KBC Zagreb, Croatia*

NTRODUCTION 80 years old patient from Zagreb was seeking help in the Emergency due to abdominal pain. MSCT showed thickened wall of ileum with a sharp foreign object inside and some free fluid in the right lower quadrant. He had clinical picture of acute abdomen and was suggested to go for surgery, which he refused. He was admitted and treated medically for tree days. He felt better after treatment. CASE A day after discharge home the patent seeks help at the emergency department in our ER due to increasing abdominal pain like he had before he was treated at the first hospital. He had regular stools. His abdomen was soft, with mild pain on palpation in LRQ, without peritoneal discomfort, peristalsis was heard. X-ray, ultrasound and CT were done and confirmed foreign object. Patient was treated only medically

again due to refusal of surgical treatment and despite presented risks left the hospital. Next day he comes back to the emergency. He does not have improvement of the symptoms. He agrees with the surgery but refuses any transfusion because he is member of the Jehovah Witnesses. During the surgery many perforations of the distal ileum were found together with the wooden object size of 3x0,1cm. Distal ileum wall was thickened and edematous. Resection of 20cm of injured ileum together with bipolar ileostoma was made in the RLQ. CONCLUSION Postoperative treatment was without complications. Patient still has ileostoma and is coming for a regular checkups to the outpatient clinic.

CR31
Persistent left-sided pleural effusion – rare manifestation of iatrogenic pulmonary vein stenosis

Ana Kovačević[a], Ivona Kovačević[a], Marija Gomerčić-Palčić[a]

[a]*Department for clinical immunology, pulmonology and rheumatology, University Clinical Hospital Center „Sestre Milosrdnice“*

Ana Kovačević 0000-0002-9745-1531, Ivona Kovačević 0000-0003-0284-1762

Key words: pulmonary vein stenosis, pleural effusion, atrial fibrillation

INTRODUCTION Radiofrequency (RF) ablation is a method of choice for treating patients with paroxysmal and persistent atrial fibrillation (AFib) refractory to antiarrhythmics. Pulmonary vein stenosis (PVS) is a rare complication of RF ablation that occurs in 1-3%. Patients may be asymptomatic, or present with dyspnea, cough, hemoptysis, and chest pain. CASE REPORT Here we present a case of 67-year-old male who was hospitalized due to hemoptysis and dyspnea. Five months before admittance he had undergone RF ablation procedure for paroxysmal AFib and at the same time, NOAC was introduced. Chest CT detected a few hemorrhagic infiltrations and a small left sided pleural effusion. No malignant cells or other pathogen were isolated in bronchoscopic specimen. Tumor markers were within normal limits. NOAC was excluded because of lung parenchyma hemorrhage. Hemoptysis did not reoccur, whereas PET/CT scan detected progression of left sided pleural effusion compressing the adjacent lung parenchyma. TTE, TEE, treadmill stress-test and coronary angiography were normal. As pleural effusion progressed, a chest drain was placed and during four days, 5 L of effusion was drained. Repeated cytological analyses of the pleural effusion showed mixed type of effusion with tinge of blood. Cardiac MSCT revealed left inferior pulmonary vein stenosis 13 mm from atrial confluence. Balloon angioplasty and stent insertion is being planned. CONCLUSION Although rarely, recurrent pleural effusion may be primary manifestation of PVS even if only one vein is stenotic. Because of symptomatic and progressive pleural effusion, this patient will undergo vascular intervention which has not yet been done in our country.

CR32
Tinea capitis profunda with secondary bacterial infection

Manja Grašek[a], Matija Mozetič[a], Matic Sedej[a], Špela Grilc[a]

[a]*University Medical Centre Ljubljana*

Key words: fungal infection, Microsporum, child

INTRODUCTION Tinea capitis is a mycotic infection of the scalp, which primarily affects children. It is caused by different infectious agents, in Slovenia most common being Microsporum canis.

CASE REPORT A 10-year old boy was admitted to our dermatology clinic due to the alopetic annular lesion in the frontal area of his scalp. It was painful, infiltrated and covered in yellow crusts. It first appeared a month before, when the efflorescence was scaly and erythematous, and later progressed to a purulent lesion. He confirmed to have been in close contact with several different animals including cats. Otherwise, he was healthy and the rest of the examination was within normal limits. A potassium hydroxide exam of the skin scrapings was negative, however, as the clinical picture was characteristic for a deep fungal infection, we prescribed systemic antimycotic therapy. Soon we received confirmation of the disease, identifying the isolate from the culture as Microsporum canis. The boy was treated with oral antimycotic itraconasol, antifungal cream and shampoo as well as oral corticosteroids in decreasing doses due to severe inflammation. Moreover, because of the laboratory-confirmed secondary bacterial infection with Staphylococcus aureus, additional systemic and local antibiotic therapy were necessary. He was discharged after three weeks when his condition had majorly improved. He was later regularly checked in our outpatient clinic until two successive fungal cultures were negative. CONCLUSION Deep fungal infection is a rare entity, which has to be promptly treated with systemic antimycotic therapy for an appropriate amount of time as to avoid any further complications.

CR33
Alveolar ridge augmentation using xenogenic bone graft and resorbable membrane

Nikola Matijević[a] , Marko Matijević[b] , Marija Pejakić[b] , Željka Perić Kačarević[c]

[a]*School of Dental Medicine, University of Zagreb, Zagreb, Croatia*
[b] *Faculty of Dental Medicine and Health Osijek, Department of Dental Medicine, J.J. Strossmayer Univeristy of Osijek, Osijek, Croatia*
[c] *Faculty of Dental Medicine and Health, Department of Anatomy, Histology, Embryology, Pathology Anatomy and Pathology Histology, J.J. Strossmayer University of Osijek, Osijek, Croatia*

INTRODUCTION Bone resorption follows tooth loss and occurs in all three dimensions. Especially in the anterior region of the alveolar ridge, it can be a significant problem. Nevertheless, bone has a significant ability for regeneration due to the dynamic balance of osteoblastic and osteoclastic activity. Therefore, many different biomaterials and procedures are being used in bone augmentation with the aim to restore lost tissue and function. CASE REPORT Male patient, the age of 22, lost a crown of upper right canine due to extensive caries and developed a periapical cyst. Cone beam computed tomography (CBCT) showed a considerable bone loss with a loss of buccal corticalis. After root extraction and debridement, a mucoperiosteal flap was raised buccally and the defect was filled with xenogenic bone substitute (Cerabone, Botiss GmbH). Resorbable membrane (Jason membrane, Botiss GmbH) was placed on top of the defect securing the bone substitute in place. A mucoperiosteal flap was secured with 5-0 sutures. Following the six months of healing, control CBCT was done to asses density of the newly formed bone. The dental implant was placed at the site of augmentation and still needs to undergo a full osseointegration process, after which the patient will be provided with a definite prosthetic crown. CONCLUSION This case emphasizes augmentation of the alveolar ridge using xenogenic bone substitute and resorbable membrane as a goal to restore patients function and aesthetics, and to prevent further complications that follow tooth loss.

CR34
Case report: Community acquired pneumonia in young adult

Špela Grilc[a], Matic Sedej[b], Matija Mozetič[c]

[a]*Healthcare Center Radovljica*
[b]*University Medical Center Ljubljana*

A community acquired pneumonia is a common infectious disease with approximately 80% patients treated on an outpatient basis. A 37-year-old female presented to an urgent care office with a 5-day history of productive cough, progressing to yellow colored sputum and high fever. She experienced mild shortness of breath with higher frequency of breathing in past days. Moreover she felt some sharp both-sided chest pain after coughing. Originally, she had a cold started a week before a high fever, but the symptoms had worsened in last five days. Her medical history revealed no diseases or substance use. She was febrile with 38,7°C, tachyicardic- 110/min, normotensive 134/76, tachypnoic, oxygen saturation was 95%. Heart auscultation sounds were normal. Respiratory examination revealed some mild basal crackles on left side. The laboratory results show : leukocytosis, neutrophilia, CRP >210 mg/L. Her CURB65 score was: 1. We decided to treat her with amoksycylina 1000 mg every eight hours and plan next check on fourth day of therapy. In clinical examination she was much beter after four days of antibiotic, however crackles were still presented. Due to good response we continued with amoksycylina in same dose for four more days. We did not decide for chest x ray. Her next appointment in our clinic was on the eighth day of antibiotic use, when her CRP and leukocytes were almost in normal values. The leading bacterial cause for pneumonia is Streptoccocus pneumoniae. CURB65 scoring is a simple fast and effective clinical decision tool.

CR35
Case report: Kidney stone disease in emergency care ambulance

Špela Grilc[a], Manja Grašek[b], Barbara Zupanc[c]

[a]*Healthcare Center Radovljica*
[b]*University Medical Center Ljubljana*
[c]*Healthcare Center Kranj*

Kidney stones can affect any part of urinary tract . It is an urological disorder affecting about 2- 5% of worldwide population, more common in countrys with high standard. It is the most commonly appeared in people between the ages of 18 nad 45 years. The disease affects male more frequently then female. Passing kidney stones is usually painful. A 63-year-old man, diagnosed with previous kidney stones episode, came to our ER office due to severe

pain in the right side and back bellow the ribs. The pain was coming in waves and fluctuates in intensity. He also had some pain on urination. He denied fever. In clinical examination he was afebrile, eupnoic, the lung sound were clear, the abdomen was soft but painful on palpation on both sides also palpation of the back was painful. We gave him tramadol 50 mg, ketoprofen 100 mg and tiethyperazine 6,5 mg in 100 mL in saline for pain intravenously. Blood sample did not show infection also urine sample was normal. Naproxen 500 mg two times daily was prescribed. After 2 day she experienced severe pain again, but it was localised in lower abdomen and radiated in groin, he had very painful urination. He visited emergency care office again, we gave him ketoprofen 100 mg, trospium 5 mg and tramadol 5 mg in 100 mL of saline intravenously. It released the pain His urin sample showed an urinary tract infection. His CRP level was 30.We prescribed him Ciprofloksacin 1000 mg daily. In diferential diagnosis of kidney stone disease we always have to think on urinary tract infection, which can also be a complication of the disease.

CR36
Reverse arthroplasty - alternative to conventional surgical methods in communitive proximal humerus fracture and severe rotator cuff tear.

Matic Sedej[a], Barbara Zupanc[b], Špela Grilc[c]

[a]*University Medical Center Ljubljana*
[b]*Healthcare Center Kranj*
[c]*Healthcare Center Radovljica*

Keywords: reverse arthroplasty, surgical alternative, rotator cuff tear, proximal humerus fracture

INTRODUCTION The reverse shoulder arthroplasty is a type of shoulder replacement in which the normal ball and socket relationship of glenohumeral joint is reversed, creating a more stable joint with a fixed fulcrum. It was developed as a potential solution in response to the cases which could not be managed effectively with a conventional shoulder arthroplasty. The most common post-surgical complication is instability. CASE REPORT This case report includes two patients that had undergone this type of arthroplasty. The first patient was admitted after suffering a comminuted proximal humerus fracture. The second patient suffered a total rotator cuff tear. Both of our patients had severely restricted mobility and pain in the shoulder prior to the procedure and reverse arthroplasty was considered to give the best results. After the surgery they started with physical rehabilitation for several weeks. We noticed considerable improvement in range of motion and reduced pain compared to the condition before the surgery. CONCLUSION Reverse shoulder arthroplasty is utilized in cases in which conventional shoulder replacement surgery would result in poor outcomes and high failure rates. The most common such cases are massive rotator cuff tear, shoulder fractures and failed prior shoulder replacement procedures. Indications continue to expand and the number of prostheses implanted is rapidly growing.

CR37
Deep vein thrombosis: a case report

Barbara Zupanc[a], Špela Grilc[b], Matic Sedej[c]

[a]*Healthcare Center Kranj*
[b]*Healthcare Center Radovljica*
[c]*University Medical Center Ljubljana*

Key words: deep vein thrombosis, pulmonary embolism, Wells score, D-dimer, anticoagulant therapy

INTRODUCTION Deep vein thrombosis (DVT) is an obstruction of the vein caused by thrombus. It most commonly occurs is the deep veins of the lower extremity. DVT is divided into distal and proximal vein thrombosis. Symptoms of DVT include warmth, swelling, pain and erythema of the involved extremity. Risk factors are old age, pregnancy, synthetic estrogen, trauma, surgery, past DVT, cancer, obesity, immobility and thrombophilia. Wells score evaluates the likelihood of DVT. D-dimer assay should be routinely performed. It has a negative predictive value for GVT. Ultrasound evaluation is recommended for patients with likely DVT according to the Wells score or a positive D-dimer assay. Treat with low molecular weight heparin (LMWH) immediately. Start warfarin simultaneously with LMWH for 3-6 months. CASE PRESENTATION 80-year old female presents to the outpatient department due to a week of right leg swelling with calf tenderness. She denies having any difficulties breathing. Her regular therapy consists of antihypertensive drugs. On physical examination her vitals are: blood pressure 140/80 mmHg, heart rate 80/min, oxygen saturation 98 %, body temperature 36,5 °. Right calf is warm and painful on palpation. Her Wells score is 3. There is no D-dimer assay available in the outpatient department. She is urgently referred to the nearby hospital for further evaluation. CONCLUSION Proximal vein thrombosis is most commonly associated with the development of pulmonary embolism (PE). PE is a medical emergency. Anticoagulant therapy is indicated for patients with DVT, since PE will occur in 50 % of untreated individuals.

CR38
Community- acquired pneumonia: a case report

Barbara Zupanc[a], Manja Grašek[b]

[a]*Healthcare Center Kranj*
[b]*University Medical Center Ljubljana*

Key words: community-acquired pneumonia, Streptococcus pneumoniae, antibiotic therapy

INTRODUCTION Community-acquired pneumonia (CAP) is an acute lower respiratory tract infection in a patient who has acquired the infection in the community. Patients typically present with fever, dyspnea, productive cough and pleuritic chest pain. On physical examination tachypnea, auscultatory rales, increased tactile fremitus and purulent sputum are present. Most common pathogens are Streptococcus pneumoniae, Haemophilus influenza and Moraxella catarrhalis. Streptococcus pneumoniae is the causative organism for up to 2/3 of all CAP. With clinical suspicion of pneumonia full blood count, urea, electrolytes and CRP should be tested. Chest x-ray typically shows lobar infiltrates. Sputum can be microbiologically tested to identify the pathogen. Supportive therapy as well as antibiotic therapy according to national guidelines is advised. CASE PRESENTATION A previously healthy 45-year old male presents to the outpatient department due to fever, cough and malaise for 2 days. On physical examination his vitals are: blood pressure 140/70 mmHg, heart rate 80/min, oxygen saturation 96%, body temperature 38 °C, breathing frequency 24/min. On auscultation rales are heard over the right lower lobe. His laboratory results show leukocytosis with elevated CRP. Chest x-ray is performed and a consolidation is seen in the right lower lobe. He is prescribed amoxicillin 500-1000 mg/8 h per os for 7-10 days. CONCLUSION CAP is one of the most common infectious diseases and is associated with considerable morbidity and mortality, particularly in elderly patients and those with significant comorbidities. The most common pathogen is Streptococcus pneumoniae. Antibiotic therapy is usually started empirically.

CR39
Reconstruction and postoperative physical rehabilitation of noncontact anterior cruciate ligamentum injury from rollerblading

Matic Sedej[a], Barbara Zupanc[b], Manja Grašek[a]

[a]*University Medical Center Ljubljana*
[b]*Healthcare Center Kranj*

Keywords: physical rehabilitation, anterior cruciate ligamentum (ACL), rollerblading injury

INTRODUCTION The anterior cruciate ligament functions as a primary restraint to excessive anterior translation and rotation of the tibia on the femur; thus a complete ACL tear normally results in dynamic knee instability or failure to manage quick changes in position. Physical therapy is necessary for optimal rehabilitation whether the treatment is surgical or only conservative. CASE PRESENTATION A 29-year old healthy male presented with 24h-lasting acute pain in the knee after hearing a »pop« while rollerblading. The following morning he was unable to extend the knee fully or bear weight when walking. There was no previous history of knee injury or degenerative joint disease. The physical exam presented mild joint effusion, limitation of range of motion and pain upon palpation. Surgery was performed using a graft from the patellar ligament with the superior part of the patella. After the procedure, he started physical therapy with an emphasis on the range of motion training with the use of continuous passive motion device and weight-bearing exercises. CONCLUSION The knee is one of the joints that are most susceptible to ligament injuries, as it is located in the middle of two large lever arms. The decision for surgical reconstruction versus conservative treatment is an ongoing subject of debate. Surgery is usually the treatment of choice for professional athletes. With the implementation of post-surgical physical therapy, the result is complete recovery with normal knee function and a full range of motion in only 60-80% of cases.

CR40
Intestinal injury due to sodium polystyrene sulfonate (SPS) treatment in a heart transplant patient

Ivor Jelavić[a], Boško Skorić[ab]

[a]*School of Medicine University of Zagreb*
[b]*Department of Cardiology;University Hospital Center Zagreb*

Ivor Jelavić 0000-0002-6397-4422, Boško Skorić 0000-0001-5979-2346

INTRODUCTION Sodium polystyrene sulphonate (SPS) is a cation exchange resin widely used to treat hyperkalemia in patients with renal failure. Although infrequent, one of its most severe side effects is a gastrointestinal mucosal injury that is most commonly located in the colon. The injury can range from mild superficial injury to wall necrosis and perforation. The causative mechanisms are still unclear. The risk factors

include end- stage renal disease, hemodynamic instability, solid organ transplantation, postoperative status and gastrointestinal motility disorders, including opioid usage. CASE REPORT One month after a successful heart transplantation the patient presented with sudden hematochezia and hemorrhagic shock. Emergency laparotomy, right hemicolectomy, and end ileostomy were performed. Histopathological analysis of the resected colon revealed mucosal injury with the presence of crystals of Kayexalate in the necrotic regions. We later found out that several days before this event, the patient received SPS for the treatment of hyperkalemia owing to mild deterioration of chronic kidney disease. The patient fully recovered and was discharged from the hospital. CONCLUSION Acute lower gastointestinal bleeding has many causes, but SPS-related mucosal injury and intestinal perforation is unusual. Since our patient had several predisposing factors for this serious side effect it is important to use SPS only when necessary, especially in the postoperative patients and in those with gastrointestinal motility disorders. Although similar cases of intestinal injury after SPS therapy in solid organ transplant patients have alredy been reported this is, to our knowledge, the first reported case in a patient who underwent a heart transplantation.

CR41
Septic shock after influenza infection in immunocompromised adult.

Živa Štular[a], dr.med., Monika Jevšenak Peršolja[a], dr.med.spec.

[a]*UNIT SNMP - Community Health Centre Ljubljana*

Key words: septic shock, influenza, cancer

Severe sepsis is traditionally associated with bacterial diseases. However, viruses are becoming a growing cause of severe sepsis worldwide. Immunocompromised patients are particularly at risk. A 42-years old male came to ER at 4 am with one-month lasting cough, fever and pain in both feet. He complained that the pain is so bad that he can hardly walk and that was the reason that he did not make an appointment with his general practitioner. He was very tired this past month, he lost appetite and consequently more than 5 kg. His past medical history included squamous cell carcinoma of the retromolar trigone. The cancer was treated 2 years ago with chemoradiation therapy. He had regular follow up appointments. On physical examination he was alert, oriented, blood pressure 114/70 mmHg, pulse 130/min, febrile 38,2°C, oxygen saturation 95%, breathing was normal, heart rhythm was regular without murmurs, abdominal tenderness, no sign of rash, there was tenderness to touch all over body. He was treated with paracetamol and fluids. Two hours after examination the patient was stuporous. His blood pressure was 94/54 mmHg, pulse 120/min, afebrile, Hb 67 g/L. He received another 1500ml of fluid i.v., but his blood pressure did not improve, so we started with norepinephrine. We started with fluclox and gentamicin. He was transferred to our acute medical unit. He was diagnosed with flu. His cancer progressed and it was revealed he is suffering from hepatic cirrhosis. We believe that septic shock in our patient was a result of complication viral infection in immunocompromised host.

CR42
Plaque and guttate psoriasis in a child treated with biological therapy

Manja Grašek[a], Špela Grilc[a], Barbara Zupanc[b]

[a]*University Medical Centre Ljubljana*
[b]*Healthcare Centre Kranj*

Key words: psoriasis, child, biological treatment, adalimumab

INTRODUCTION Psoriasis is a chronic inflammatory disease, which is predominantly characterized by erythematosquamous lesions. Treatment depends on patient's age, disease severity and localization, and can extend from topical therapy and phototherapy to systemic treatment with immunosuppressive or biologic drugs. CASE REPORT A 4-year-old girl came to our dermatologic clinic due to erythematosquamous plaques on her scalp, limbs and trunk, which first appeared a few weeks before. Her father was treated for psoriasis with biological therapy. The girl's skin lesions were also typical for psoriasis, nails and joints were not affected. Therapy with corticosteroid creams and appropriate skin care were advised. She had regular check-ups, where we observed her symptoms worsening. We decided to start immunosuppressant therapy with methotrexate, which greatly improved her skin. After decreasing the doses and discontinuation of systemic treatment after two years, her condition remained stable. She noted occasional partial regressions of the lesions, which were treated with topical corticosteroids and immunomodulators. However, after about a year, a generalized deterioration of the disease was visible, including lesions typical for inverse psoriasis. We prescribed biologic therapy with adalimumab, which she still receives every two weeks along with additional local therapy when needed. The treatment is successful, at her recent check-up the skin lesions were still in regression. CONCLUSION The use of biological therapy for psoriasis in children in Slovenia is rare, however, it is an effective option in case of moderate to severe symptoms, which have not been relieved by other types of treatment.

ABSTRACTS

Clinical Medicine, Literature Review & Other

CM1
Incidence of central diabetes insipidus in brain dead patients

Fran Rode[a], Marinko Vučić[b]

[a]*School of Medicine University of Zagreb*
[b]*Sestre milosrdnice University Hospital Center Zagreb*

Fran Rode (0000-0002-8787-2455), Marinko Vučić (0000-0001-9679-9061)

Key words: central diabetes insipidus, brain death

Antidiuretic hormone (ADH), also called arginine vasopressin, is a hypothalamus-produced hormone stored and secreted in the posterior pituitary gland. When concentration of extracellular fluid increases, fluid leaks from hypothalamic osmoreceptor cells, creating a signal for ADH secretion. ADH is responsible for water retention in the kidneys. In brain dead patients, lack of ADH production occurs. Plasma half-life of ADH is 15-18 minutes. Therefore, full depletion of ADH should be expected soon after brain death, causing central diabetes insipidus (CDI). The aim of the study was to show incidence of CDI in brain dead patients. Data of patients with verified brain death at Sestre milosrdnice University Hospital Center in Zagreb from 2015 to 2018 were analysed. Poliuria, low urine specific gravity, hypernatriemia and response to desmopressin were criteria for CDI. In four year time period, 89 patients were verfied as brain dead. Out of them, 71 (79.8%) developed CDI. CDI was expected in all patients with defined brain death. However, only 79.8% of them developed CDI. One possible explanation may be preserved function of hypothalamic osmoregulation system in some patients. Parts of hypophisis and hypothalamus may stay sufficiently perfused by arteria hypophisialis inferior, which branches off extradural segment of arteria carotis interna, and is therefore protected from increased intracranial pressure. Other, less likely possibilities are presence of extracranial tumor with ADH secretion or passive ADH leakage from non-viable hypothalamic cells.

CM2
The effect of Triclosan coated polyglactin 910 suture on incidence of surgical site infection in patients after colorectal operations

Fran Rašić[a], Branko Bakula[b]

[a]*School of Medicine University of Zagreb*
[b] *Clinical Hospital Sveti Duh*

Fran Rašić (0000-0002-4398-7568), Branko Bakula (0000-0001-6981-7877)

Key words: polyglactin 910, triclosan, colorectal surgery

Surgical site infections (SSI) are defined as infections that occur 30 days after surgery. They are among the most common healthcare-associated infections. The aim of our study was to evaluate antimicrobial efficiency of Triclosan coated Polyglactin 910 suture in our patients with colorectal cancer. In our prospective study participants were patients of our surgical departement which underwent colon resection for diagnosed colorectal cancer. For abdominal closure in half of patients Polyglactil 910 coated with triclosan was used and in the other half Polyglactil 910 without triclosan. The occurrence of SSI among groups were observed. Aswell, duration of hospitalization, early postoperative leukocyte and CRP levels were observed. The mean hospitalization period was 11,7±1.2 day in the Triclosan group and 16.4±2.2 in the Non - triclosan group. In both groups lekocyte and CRP levels were similary elevated on 2nd and 5th postoperative day. Higher average leukocyte and CRP levels were found in first group on 7th and 10th postopetaive day. Significantly less SSIs were seen in Triclosan group compared with the Non - triclosan group (10,81% vs 22,2%). SSIs areassociated with longer post-operative hospital stays, may necessitate additional surgical procedures, may require intensive care, and result in higher attributable morbidity and mortality Our study confirmed that patients in which abdominal wall was closed with triclosan coated suture had much better results, less incidence of SSI, shorter hospitalization time and better cost effectiveness.

CM3

The Survival Rate of Lung Transplant Patients in Croatia

Tomislav Šklebar [a], Mateja Janković Makek[ab], Goran Glodić [b], Gordana Pavliša[ab] , Ana Hećimović[b] , Feđa Džubur[ab], Miroslav Samaržija[ab]

[a]*University of Zagreb, School of Medicine, Zagreb, Croatia*
[b]*University Hospital Center Zagreb, Department for Respiratory Diseases Jordanovac, Zagreb, Croatia*

Key words: lung transplantation, survival rate, graft rejection

INTRODUCTION AND OBJECTIVE Nowadays, lung transplantation is accepted modality of treatment for well-selected patients suffering from terminal, non-malignant respiratory disease. The aim of this study was to determine post-transplant survival rate and to give general overview of lung transplant patients in Croatia. Patients studied in this research were transplanted through the lung transplantation programme at Clinical Centre for Pulmonary Diseases Jordanovac, University Hospital Centre Zagreb. METHODS The research is retrospective analysis of prospectively collected data on 71 patients from year 2001 until February 2019. Descriptive statistics were calculated and survival outcomes were analysed by the Kaplan-Meier method. RESULTS Since the first transplantation in February 2001 to February 2019 all transplantations through lung transplantation programme in Croatia were performed in AKH Vienna. Total number of transplanted patients, was 71 (33 male (46,48%) and 38 female (53,52%)) with median of age 52. Survival rate after the 1 st post-transplant year was 79,1% after 3 rd year 69,8% and after 5 th year 63,0% with mean survival rate of 78,96 months. The time on the waiting list increased from median of 61,5 days (in years 2010-2015) to 138,5 days (in years 2015-2018). Clinically significant graft rejection experienced 39,4% of patients after median time of 61,56 months. CONCLUSION Survival rate of lung transplanted patient in Croatia is comparable to other European countries. Analysing such a type of data is crucial in addressing possible improvement measures and broadening general knowledge in the field. In the aim to improve patient outcomes excellent teamwork among all involved specialists and strict patient follow-up are of utmost importance.

CM4

Impact of ERAS protocol on patients' recovery after colorectal cancer surgery

Lucija Stojčić[a], Fran Rašić[a], Branko Bakula[a]

[a]*Department of Surgery, Clinical Hospital Sveti Duh*

Lucija Stojčić (0000-0002-1311-1792), Fran Rašić (0000-0002-4398-7568) , Branko Bakula (0000-0001-6981-7877)

Key words: colorectal carcinoma, perioperative nutrition, malignant cachexia

Colorectal cancer is the most common malignant tumor of the digestive system with an incidence of about 40/100 000. Large bowel resections are extensive and are followed by numerous potential postoperative complications such as SSI (surgical site infection), dehiscence of anastomosis or paralytic ileus. Numerous studies have shown that the patients' nutritional status correlates with the incidence of complications. By introducing the ERAS protocol (enhanced recovery after surgery), the nutritional status of the patient is improved and the risks of complications are reduced. The aim of our study is to examine the importance of using ERAS protocol in patients with colorectal cancer. In a period of 6 months, we included 51 patients from our clinic who went under elective colon resection with ERAS protocol (ERAS group). Incidence of complications and recovery rate were observed. As a control group, we included 57 patients from our clinic that were admitted for elective colon cancer surgery a year prior, but didn't have perioperative nutritional support (non-ERAS group). The ERAS protocol patient group had significantly lower incidence of postoperative complications including SSI (11.75% versus 19.29%), dehiscence of anastomosis (1.9% vs 5.2%) and dehiscence of the abdominal wall (0 vs 3.5%), compared to the patients in the non-ERAS protocol group. They also had shorter hospitalization time (11.7 vs 14.2days). Perioperative nutritional support reduces the risk of complications in patients undergoing colon resection, accelerates recovery and returns the patient to his daily activities sooner, resulting in reduced treatment expenses.

CM5

Cognitive impairment prediction in patients with hypertension with Pulse Wave Velocity and arterial stiffness measurement

Varahabhatla Vamsi[a], Aitham Venkat Ratnam[a], Marina Sikorskaa[b], Ganna Gritsayc, Ingrid Prkacin[d]

[a]Zaporozhye State Medical University, Ukraine[b]Department of Neurology, Zaporozhye State Medical University, Ukraine
[c]Department of Family Medicine, Zaporozhye State Medical University, Ukraine
[d]Department of Internal Medicine, Zagreb School of Medicine, Zagreb, Croatia

Key words: arterial stiffness, central blood pressure, hypertension, cognitive impairment, vascular dementia

INTRODUCTION The blood supply of the brain gradually reduces with ongoing age, the cerebral cortex undergoes atrophy, causes cognitive inhibition converting to vascular dementia and Alzheimer's in later stages. The relation between cognitive impairment (CI) and high blood pressure has been long studied in elderly patients, necessitating for further research and evidence on this topic. AIM To study the parameters of arterial stiffness (AS): central blood pressure (CBP), pulse wave velocity (PWV) in patients with hypertension and determine it's relationship with vascular CI. METHODS AND MATERIALS A systematic literature review was performed using a standardised published methodology; 25 studies were selected from last 10 years from google search engine, Pubmed central and NCBI with keywords like AS, CBP, PWV, CI. RESULTS PWV was a significant and independently associated with cognitive function when measured with mini mental state examination in an elderly population in Japan. The relationship between high vascular stiffness and CI is explained as the disturbance in regulation of endothelial nitric oxide release. This in turn causes a neuronal energy crisis initiated by cerebral hypoperfusion due to impaired vascular tone and develops CI. As elderly population tend to have an increased risk for arteriosclerosis which is highly predicted by PWV, these patients are highly prone to develop vascular dementia and Alzheimer's in future. CONCLUSION An inverse relation between AS and cognitive function was found and provided an evidence to vascular hypothesis of vascular dementia and Alzheimer's. Prospective studies involving these early predictive markers PWV and AS may help in therapeutic intervention and progression of the disease.

CM6

Hospital-acquired infections in the surgical intensive care unit

Lucija Stojčić[b], Fran Rašić[a], Branko Bakula[a]

[a]Department of Surgery, Clinical Hospital Sveti Duh
[b]School of Medicine University of Zagreb

Lucija Stojčić (0000-0002-1311-1792), Fran Rašić (0000-0002-4398-7568), Branko Bakula (0000-0001-6981-7877)

Key words: hospital infection, intensive care unit, catheter related infection

During the hospital stay, patients are exposed to risk factors for nosocomial infections. These risks are particularly increased in patients placed in the ICU, because of their exposure to numerous invasive diagnostic and therapeutic procedures. Some of the most significant risk factors arise from invasive central venous catheters, mechanical ventilators causing pneumonias and urinary catheters causing urinary tract infections. The aim of this study is to determine the frequency of infections related to invasive therapeutic methods and to discover their most frequent causes. Data were obtained retrospectively from the Surgical Department ICU in the Clinical Hospital "Sveti Duh" from January 1, 2014 until December 31, 2016 using the electronic medical record system. Two thousand and fifty one patient were admitted. These patients were hospitalized for a total of 8,782 days, with an average stay of 3.62 days. Incidence of catheter-associated urinary tract infection was 26. The number of patients who were on mechanical ventilation was 533, while 16 of them developed VAP. The total mortality was calculated to be 7.06%. Hospital infections are good indicators of healthcare and they represent an increasing problem in modern healthcare; they prolong treatment duration and duration of hospital stay. Risk of acquiring nosocomial infections is increased by the number of therapeutic procedures and the duration of their implementation. The most common infection associated with invasive therapeutic procedures was caused by the urinary catheter and the most common isolated bacterium was Acinetobacter baumamnnii.

CM7
Effects of light pollution on students sleep quality

Dorian Laslo[a] , Terezija Berlančić[a,b,c], Maja Miškulin[a] , Ivan Miškulin[a]

[a]*Faculty of Medicine Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia*
[b]*Faculty of Economics in Osijek Josip Juraj Strossmayer University of Osijek, Osijek, Croatia*
[c]*University Hospital Centre Osijek, Osijek, Croatia*

Key words: light pollution, sleep quality, sleeping habits, students, Croatia

INTRODUCTION Prevalence of insomnia is between 10% and 20%, out of those 50% are chronic cases. It is a common condition characterized with difficulty initiating or maintaining sleep, and symptoms such as irritability or fatigue during wakefulness. Light pollution has become a global problem in recent years and its connection to disruption of sleeping patterns and circadian rhythm in animals and people has been proven and reported. AIMS The aim of this study was to determine the effects of light pollution on Croatian students' sleeping habits. PARTICIPANTS AND METHODS This on-line, anonymous questionnaire study was done during January and February 2019 by the use of specially designed questionnaire which contained questions regarding the demographic data, sleeping habits and questions about light pollution. RESULTS There was a total of 202 participants, mean age 21,8 years (range 18 to 31 years). Out of them 79.2% (160/202) were females. According to the working status 70.8% (143/202) were students who did not work, 25.7% (52/202) worked one shift and 3.5% (7/202) worked night shifts or more different shifts. Most of them, 76.7% (155/202) fell asleep in less than 30 minutes, 20.8% (42/202) fell asleep 60-90 minutes, and 2.5% (5/202) fell asleep after 90 minutes. Most of the participants 94.1% (190/202) didn't plan on moving because of light pollution. There was a statistically significant difference in quality of sleep and amount of light around the household ($p<0.001$). Conclusion: Light pollution affects sleeping habits of Croatian students and is becoming a larger problem every day.

CM8
Drug Shortages in Three Randomly Selected Public Pharmacies in Montenegro

Jana Đapić[a], Nataša Duborija Kovačević[b], Benida Šahmanović[b], Mitar Popović[b], Isidora Rubežić[a]

[a]*University of Montenegro, Faculty of Medicine, Podgorica, 81000, Montenegro*
[b]*Department of Pharmacology and Clinical pharmacology, University of Montenegro, Faculty of Medicine, Podgorica, 81 000, Montenegro*

Key words: drugs, pharmacies, drug shortages, ATC classification system

INTRODUCTION AND AIM Drug shortages (DS) cause many problems for physicians, health care facilities, patients and regulatory bodies. This study was performed to determine which medicines, depending on Anatomical Therapeutic Chemical (ATC) classification system and route of administration, were short in supply in public pharmacies in Montenegro during one-year period. METHODS Given the lack of national database of medicines in short supply, required information were obtained through semi-structural interviews about DS during 2018, with pharmacists employed in three public pharmacies, randomly selected from each region of the country. This prospective study was carried out within the framework of a two-year National project on DS in Montenegro. RESULTS Most of the drugs short in supply were Ophthalmological drugs (ATC code S01) in the form of eye drops, with prevalence of anti-glaucoma preparations and miotics (S01E), such as pilocarpine, timolol and travoprost. The second place was taken by Antidepressants (N06A) for oral administration, like amitriptyline, escitalopram and mianserin. They were followed by Antibacterial drugs for systemic application (J01), such as cefuroxime and ceftriaxone, and Psycholeptics (N05), most often Antipsychotics (N05A), like promazine, and Anxiolytics (N05B), like bromazepam. CONCUSLION Patients with eye diseases, especially glaucoma, were mostly affected by DS during the one-year period in Montenegro. In second place are patients with depression, in which the lack of the right remedy can have serious consequences, including suicide. It is necessary that all members in the supply chain take additional measures and activities in order to reduce this problem.

This research was financially supported by the Ministry of Science of Montenegro.

CM9
Non Small Cell Lung Cancer Incidence by Age and Histological Types Distribution

Isidora Rubežić[a], Jana Đapić[a], Mileta Golubović[a]
[a]*University of Montenegro Faculty of Medicine, Podgorica, 81000, Montenegro*

Key words: lung cancer, NSCLC, squamous cell carcinoma, adenocarcinoma, age

INTRODUCTION AND AIM Lung cancer is one of the most common malignant neoplasms and the leading cause of tumor-related death in both sexes. As the advancing age is an important risk factor for its development this tumor occurs mostly in elderly people. There are four histological types: small lung cell cancer (SCLC), adenocarcinoma, squamous and large cell carcinoma. The last three are together referred to as non-small cell lung cancer (NSCLC). This research was conducted to determine the incidence of NSCLC among different age groups and estimate the distribution of different histological types of NSCLC. METHODS Center for Pathology at Clinical Center of Montenegro was done. The data were analysed using Microsoft Office Excell 2016. RESULTS AND CONCLUSION There were 442 non small cell lung cancers in total and from 2012 to 2014 the number of NSCLCs increased by 11%. The highest incidence of NSCL was noted in individuals aged 60 to 69 (40.04%) and 50 to 59 (30.32%). Out of 364 NSCLCs that were in more details histologically specified, 183 (50.27%) were squamous and 171 (46.98%) were adenocarcinomas. The predominant histological type was squamous, which correlates to high cigarette smoking incidence in Montenegro and more than one third of new cases were diagnosed in people in seventh decade of life, which might be due to late cancer diagnosis.

LR1
Comparison of guidelines for pain management in palliative patients

Sandro Gašpar[a], Iva Hižar[a]

[a]*School of Medicine University of Zagreb*

Iva Hižar (0000-0002-8300-4095), Sandro Gašpar (0000-0001-8941-1831)

Key words: palliative care, pain, guidelines

Due to increasing life expectancy and great number of palliative patients in the world guidelines for treating pain are necessary for better quality of life of those patients. We have compared Croatian national guidelines for pain management in adults, ESMO (European Society for Medical Oncology) guidelines, guidelines of American Society of Clinical Oncology Clinical Practice (ASCO) and WHO (World Health Organization) guidelines. We wanted to know if Croatian guidelines are following the good clinical practice of ESMO, ASCO and WHO guidelines. Comparing the guidelines we have determined that all guidelines are similar, there are slight differences in usage of cannabinoids as drugs in pain management. All guidelines emphasize active role of patient in pain management, all use the same classification of pain (mild, moderate and severe pain) based on visual analogue scale. All four mentioned guidelines have 3 steps of pain management and recommended drugs to be used; first step paracetamol and NSAID, second step mild opioids with combination of NSAID and paracetamol, and third step usage of strong opioids. ESMO and ASCO also indicate that usage of cannabinoids could reduce the usage of strong opioids, but it must that be investigated furthermore. Croatian guidelines are up to date according to ESMO, ASCO and WHO guidelines. The only difference is emphasizing the usage of cannabinoids which should be considered in future Croatian guidelines for pain treatment.

LR2
Comparison of clinical guidelines for the diagnosis and management of febrile seizures

Iva Hižar[a], Sandro Gašpar[a]

[a]*School of Medicine University of Zagreb*

Iva Hižar (0000-0002-8300-4095), Sandro Gašpar (0000-0001-8941-1831)

Key words: guidelines, seizures, pediatrics

Febrile seizures are one of the most common neurological conditions in childhood, affecting 2-5 percent of all children and are most common seizure disorder in children aged 6-60 months. Therefore, developing evidence-based guidelines is important for improving the healthcare quality for those patients. We have compared The Croatian Society of Pediatric Neurology (HDDN) guidelines for the diagnosis and therapy of febrile seizures with the guidelines of American Academy of Pediatrics (AAP), International League Against Epilepsy (ILAE) guidelines and several other national guidelines. All of the guidelines we have studied were based on American guidelines with slight differences between them. The main difference between the American and Croatian

guidelines is that the Croatian guidelines recommend hospitalization for all children with the first episode of febrile convulsions, while according to American guidelines, hospitalization is not necessary in children older than 18 months with the first episode of simple febrile convulsion. Although our national guidelines show many similarities to guidelines of American Academy of Pediatrics and other national guidelines, there are certain differences that are characteristic for Croatian healthcare system. Since the Croatian guidelines were published six years ago, in the near future it would be important to reevaluate and update the guidelines with the aim of clinical practice improvement.

LR3
Differential effect of gabapentin therapy on cognitive functions in healthy individuals

Kaja Grgić[a]

[a]*Faculty of Medicine, University Josip Juraj Strossmayer of Osijek*

Kaja Grgić (0000-0002-5429-8784)

Key words: Gabapentin, Epilepsy, Off-Label Use

Gabapentin is a GABA analogue used to treat partial seizures, neuropathic pain and off-label for treatment of anxiety disorders. There is no clear evidence for gabapentin therapy in any psychiatric indications (Systematic review Berlin RK). Gabapentin has abuse potential due to its anxiolytic properties and additive effect with opioids. We aimed to explore effects of gabapentin use on cognitive functioning based on results of clinical trials. We carried out a literature search for a period 1995 to March 2019 in three databases (PubMed, Embase, Cochrane) using: gabapentin AND cognition, gabapentin AND memory. Inclusion criteria were the following: randomized controlled trial, cognition test(s), no additional pharmacological manipulations, healthy individuals. After the application of inclusion criteria a total of 7 articles out of 66 were included. 5/7 of the studies showed that gabapentin has negative effect on short term memory, problem-solving tasks, recall ability or mood. 1 stated there is no significant effect on driving performance. 6/7 studies showed some negative effects on simulated driving performance, vigilance, reaction time, finger tapping or other motor skills. Subjective complaints of negative cognitive effects were as often as with carbamazepine or topiramate when compared, despite the objectively milder cognitive effects of gabapentin. Multiple studies on healthy volunteers suggest that the cognitive effects of gabapentin are less severe than those associated with carbamazepine or topiramate used for same indications. Longest randomized double-blind crossover comparison study (Salinsky MC) compared gabapentin with carbamazepine during 12-week period. In 8 of the 31 neuropsychological measures assessed gabapentin had better performance.

O1
Forgotten patients – ill management of elderly patients in foster care system

Tihana Kuljiš[a], Ema Karmelić[b]

[a] *School of Medicine University of Zagreb*
[b] *Zagreb Emergency Medicine Service*

Tihana Kuljiš 0000-0002-9693-2835, Ema Karmelić 0000-0002-2973-0299

Key words: foster care, integrated care, palliative care, public health

INTRODUCTION AND GOAL Since 2014. a new palliative care system is being introduced in Croatian health care system. Through its implementation it was noticed that one group of patients is continuously standing out for the lack of proper care. Those patients were the elderly and sick patients in foster care households. It has been noted that these patients often end up in emergency rooms for various conditions all due to inadequacy of care provided. After the hospital treatment they are most commonly sent back to their foster families. In this paper our goal will be to try to understand how it is possible and allowed for patients to fall through the cracks of our health and social care system.
METHODS As a method an unstructured interview was used. Interviews with stakeholders led to reconstruction of the processes and critical points in patient management.
RESULTS Specific circumstances in which the problem occurs were determined and key elements of care recognized. General stance towards this group of patients shows significant signs of inequality in health care. Results show that the problem is systemic and mainly stems from the lack of regulation and understanding in relations between stakeholders.
CONCLUSION The problem is significant and has a major impact on patient wellbeing as well as having a great effect on day-to-day work of health institutions. Due to complexity of the situation and high number of stakeholders involved we can conclude that more attention should be given, and more resources diverted to the concept of integrated care.

ABSTRACTS

Workshop Invitations

Primary wound care workshop

Student surgical society kindly invites you to the primary wound care workshop. As young doc- tors we will often come across wounds. But do we really know how to manage wounds? Do we know how to make proper history, examination and access to the wound?
On our workshop, you will learn which wounds need special surgical attention, which wounds should and which should not be sutured. What kind of drugs do we use in wound care management and how often do we need to check the wound after the care. Also, we are going to teach you how to suture and show you how to make some basic, most common used knots in surgery.

Hope to see you there!
Your Student surgical society

Authors: J. Jaman, Y. Mudrovčić, A. Blažević, D. Ivanković, P. Batur, L. Biličić, K. Jelić
Andro Kosec, MD, PhD
Asst. Prof. I. Dobrić, MD, PhD
Asst. Prof. H. Silovski, MD, PhD
Asst. Prof. I. Rudež, MD, PhD

Time: Wednesday, April 10, 2019
16:00 - 17:30

Location: Hall O
"Andrija Štampar" School of Public Health

Open fractures management and treatment workshop

Student surgical society kindly invites you to the open fractures workshop. The difficulty of open fracture management has been recognized for centuries. Amputation was the mainstay of treatment until the mid-1800s. Advances in antibiotic prophylaxis, aggressive debridement, open wound management, rotational muscle flaps, free tissue transfer, and bone grafting techniques have dramatically enhanced our capacity to treat severe open fractures. In this workshop, participants will learn what defines open fractures, how to use Gustilo-Anderson Classification, initial management and outcomes of different treatment methods, what are compartment syndrome and other common complications of open fractures. Participant will be also given an opportunity to learn and practice various kinds of immobilization techniques.

Hope to see you there!
Your Student surgical society

Authors: J. Jaman, Y. Mudrovcic, A. Blazevic, D. Ivankovic, P. Batur, L. Bilicic, K. Jelic
Asst. Prof. I. Dobrić, MD, PhD
Asst. Prof. H. Silovski, MD, PhD
Asst. Prof. I. Rudež: MD, PhD

Time: Thursday, April 11, 2019
16:00 - 17:30

Location: Hall O
"Andrija Štampar" School of Public Health

Student surgical society

The differences between transplantation medicine in Croatia and BiH

Public health student society

"After I die if I am buried I will rot. If I am burnt I will become ash but if my body is donated I will live to give life and happiness to many."

Transplantation medicine has become a very successful method of treatment for different diseases. Due to shortage of organs and tissues, a good transplantation system is crucial in keeping a high standard in health care and global health coverage. Why are some countries better with transplatations while others can barely say they have transplantation medicine? How can the system be improved? Be a part of this change.

Authors: Hana Kadrić, Kristina Brkić, Roberto Mužić
Assoc. Prof. Iskra Alexandra Nola, PhD
Marjeta Majer, MD PhD

Time: Wednesday, April 10, 2019
16:00 - 18:30

Location: Hall C
"Andrija Štampar" School of Public Health

Mental health – how to take care?

Mental health problems are an increasing issue in the society, not only because they have a tendency to rise, but also because there is a huge stigma about mental health around the world. Psychiatric conditions are diagnosed in 20% of children and adolescents, and represent a huge burden in morbidity, measured in YLD (Years Lost to Disability). In Croatia, in 2017, 635 people have committed suicide. Suicide is third most common cause of death in age group 15-29, with over 20 attempts before.

World Health Organization recognized importance of peer education and support in taking care of mental health among youth in order to prevent future mental health problems. Our experience as young adults, our effort and enthusiasm can significantly help in raising awareness and combating the stigma related to mental health as well as it can improve the youth's mental health and have a positive impact on their personal growth and development. Young people, especially students are experiencing stressful and uncomfortable situations and challenges on every day basis.

Our goals are to raise awareness of importance of mental hygiene, to improve perception and opinion of oneself, to be able to make everyday introspection and recognize feelings, emotions, needs and relations that affects us. Participants will learn the concept of mental hygiene, work on the steps that can be taken to improve their mental health and reduce stressors. We will explain a correlation and a difference between the view we have on ourselves and the way other see us, and how those views determine our identity. We will discuss how labels and stigmatization have a huge effect on people, how everyone of us sometimes has a tendency to put labels on others and also on ourselves and how we can cope with that. Participants will have a chance to talk about their own experiences and learn about mechanisms that are behind many mental health issues.

Authors: Kristina Stamenković, Mirella Graffel,
Lucia Bekić, Daniel Milošević
Katarina Skopljak MD

Time: Friday, April 12, 2019
16:00 - 17:30

Location: Hall D
"Andrija Štampar" School of Public Health

3D PRINTING IN MEDICINE

Student society for innovations in medicine

AUTHORS: Luka Grgar, Luka Zvekić
Assoc. Prof. Vedran Katavić, MD, PhD

TIME: Wednesday, April 10, 2019
16:00 - 17:30

LOCATION: Hall P
"Andrija Štampar" School of Public Health

This short course on 3D printing and 3D modeling in medicine is designed for students who wish to learn how 3D printers in medicine work, their applicability and challenges. Also, students will have a chance to extend their clinical knowledge and spectrum of technical solutions intended for clinical applications. 3D printing in medicine is becoming essential knowledge for scientists and clinicians around the globe. Therefore, medical students need to be acquainted with technological advancements in order to provide high quality care for their patients.

ORAL HEALTH AND AUTOTRANPLANTATION

Student sections School of dental medicine

AUTHORS: Martina Balta, Anamarija Barbarić, Monika Burja, Matea Lokas, Petra Matijević, Petra Petani, Marija Strugačevac, Lovro Vuger

TIME: Wednesday, April 10,2019
16:00 - 17:30

LOCATION: Hall E
"Andrija Štampar" School of Public Health

The purpose of this workshop is to give a brief view on oral health, care and autotransplantation in Dental Medicine. This workshop consists of two presentations, one about oral health and care and another one about tooth autotransplantation as a treatment option. The other part of workshop is practical, each attendant can individually and correctly try teeth brushing techniques, flossing and much more. The most important part is that this interactive workshop offers simple but crucial knowledge about dental health which can be very helpful in everyday life and in the prevention of oral diseases.

CLINICAL CASE QUIZ

Students section for the promotion of healthy food and lifestyle

AUTHORS: Emanuel Brađašević, Laura Pavičić, Paula Marinović, Lea Kalajžić, Robert Marčec, Sara Marija Lovrenović, Matea Marjanović, Stjepan Patrun, Ivan Kola, Marta Horvat

TIME: Thursday, April 11, 2019
16:00 - 17:30

LOCATION: Hall E
"Andrija Štampar" School of Public Health

The students section for the promotion of healthy nutrition and lifestyle has prepared an interactive workshop for the participants of CROSS 2019. Clinical cases quiz is a workshop made to test acquired theoretical knowledge in various fields of medicine as well as teach more about how different types of diet can be tightly connected to some diseases. Aim of this workshop is to present syndromes and diseases caused by an inadequate diet in a fun way. After being divided into teams, participants will have to answer questions about the clinical cases presented in order to create correct diagnoses and plan the treatment for the patients presented. The team with the most correct answers will be awarded a symbolic prize.

Smart reading and swift publishing of clinical results and research: workshop

Students' Section of Cardiology

Dear colleagues,
Students' Section of Cardiology invites you to participate in their workshop "Smart reading and swift publishing of clinical results and research", held by assistant professor Irzal Hadžibegović, MD, PhD. In the workshop participants will learn more about clinical research and data analysis. The workshop will be an interactive step-by-step analysis of an article selected by the mentor. Whether you are starting your journey in the world of clinical research or wish to polish your knowledge, this workshop will help you through it.
We look forward to seeing you!

Authors: Lucija Marinović, Dorja Sabljak
Irzal Hadžibegović, MD, PhD

Time: Thursday, April 11, 2019
16:00 - 17:30

Location: Hall C
"Andrija Štampar" School of Public Health

Approach to infections in transplanted patients

Student Infectology Society

In this workshop students will be able to take part in a step-by-step approach to transplanted patients with suspected infection. This will include practical information on diagnostic challenges and discussion about treatment options. Four different cases will represent the broad spectrum of pathogens, clinical presentations and possible complications of this type of infections. Participants will also repeat and upgrade their knowledge of prevention and prophylaxis of most common infections in transplanted patients.

Authors: Jelena Prepolec, Iva Škrabić
Neven Papić, MD, PhD

Time: Thursday, April 11, 2019
16:00 - 17:30

Location: Hall P
"Andrija Štampar" School of Public Health

To conclude, we will try to offer a glance in the future of infectious diseases in immunocompromised patients.
Hope to see you there,
your Student Infectology Society

Testing in allergology

Student society of dermatovenereology

There are a lot of allergens and, therefore, allergies in the world. Allergic reactions are very common amongst people and their incidence is rising.

Come to our workshop to see and learn how the skin prick test is done!

Authors: Nives Pap, Laura Pavičić, Stjepan Patrun, Nikola Ferara, Matea Kuna, Valentina Diklić

Time: Friday, April 12, 2019
16:00 - 17:00

Location: University Department of Dermatology and Venereology
Zagreb University Hospital Center, Šalata 4

Basal ganglia - DIY

Student society for neuroscience

Authors: Davor Virag, Ana-Marija Vargantolić, Lea Valenčić

Time: Friday, April 12, 2019
16:00 - 18:00

Location: Hall C
"Andrija Štampar" School of Public Health

"Neurići" workshops aim to provide a different approach to understanding complex brain circuits and networks. Our main goal is a hands-on approach, and our method revolves around small electronic devices which simulate individual neurons or nuclei - "Neurići" (based on the open-source project "NeuroBytes"). Their main element is an LED indicator which continuously reports the state of an individual "neuron". "Neurići", once connected together, can therefore be used to make a textbook's description of a circuit come alive, just as it exists in vivo, where stimuli flow, diverge and converge, and all in real time. It is our hope that this visually dynamic and interactive approach will enable easier comprehension of these concepts on an intuitive level and make it easier to integrate the knowledge with related fields such as physiology, pathophysiology, pharmacology, neurology… In this workshop we'll be taking a look at basal ganglia and their role in human movement, as well as a few important diseases affecting them.

The "Blood Production" Facilities and Donorship

Student Society of Voluntary Blood Donors and Transfusion Medicine

Authors: Josip Antic
Asst. Prof. Irena Jukic, MD, PhD
Asst. Prof. Matias Trbusic, MD, PhD

Time: Friday, April 12, 2019
16:00 - 18:00

Location: Croatian Institute of Transfusion Medicine, Petrova 3

In The "Blood Production"Facilities and Donorship you will have an unique chance to visit the usually inaccessible areas of Croatian Institute for Transfusion Medicine, see with your own eyes every step a dose of blood goes from the donor to the recipient and ask away Transfusiologists everything you want to know about the process of refinement, collecting or giving blood, and the specialisation itself which contains everything from working in a laboratory and clinic to marketing and management.

ORTHObasics

Student Society for Orthopaedics and Traumatology

Authors: Luka Boban, Hana Hajsok, Vilim Molnar, Paulo Zekan
Assoc. Prof. Alan Ivković, MD, PhD

Time: Friday, April 12, 2019
16:00 - 19:00

Location: Hall O
"Andrija Štampar" School of Public Health

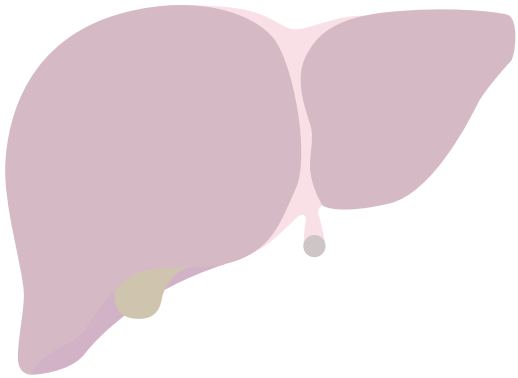
Musculoskeletal examination is regular part of practice of any physician. The goal of ORTHObasics workshop is to provide basic knowledge and practice in examination of main joints in human body. You will be taught multidisciplinary approach to joint examination and will be given materials to make your progress easier. We appreciate your participation and promise you will not regret it.

To this date, lungs have not been transplanted in Croatia, but there are plans for the first lung transplantatation in out country in the near future.

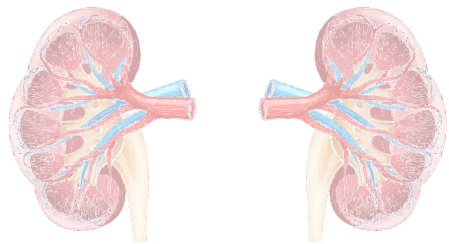
At the end of 2018, there were 38 patients on the active waiting list for heart transplantation.

PARTNERS & DONATIONS

At the end of 2018, 114 patients in Croatia were waiting for a new liver.



At the end of 2018, 168 patients in Croatia were waiting for a kidney.



cross.mef.hr

CROSS Partner Congresses

AIMS MEETING

MOSA CONFERENCE

BLIMC
Banja Luka International Medical Congress

SISB

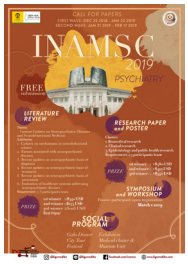
GSC
BELGRADE

MEDICINSKI PODMLADAK MEDICAL YOUTH
MP
1949

EMSA
MACEDONIA

BIMCO
Bukovinian International Medical Congress

ICMS
FOR STUDENTS
& YOUNG DOCTORS



MEDICS
2017

ZIMS
ZAGREB INTERNATIONAL MEDICAL SUMMIT

Prehrana

OSCON

15TH WIMC
15TH WARSAW INTERNATIONAL MEDICAL CONGRESS

2019.
SaMED
INTERNATIONAL MEDICAL STUDENTS
CONGRESS SARAJEVO

Donations

STUDENT SKI ZBOR SVEUČILIŠTA U ZAGREBU

ATLANTIC GRUPA

Cetina
PRIRODNA IZVORSKA VODA
NATURAL SPRING WATER
www.cetina.hr

Kala

CEDEVITA

Dukat fit

mlinar

barcaffè Black 'n' Easy

Zagreb
THE CAPITAL OF CROATIA

Uber

HOLLYWOOD VANITY CLUB
COMING SOON

Klinika za psihijatriju Vrapče
University Psychiatric Hospital Vrapče

MEDICINSKA NAKLADA

SOKRAT
ŠKOLA STRANIH JEZIKA

Author Index

Notes

cross.mef.hr

STUDENT SKI ZBOR SVEUČILIŠTA U ZAGREBU

90 1927. 2017. Škola narodnog zdravlja „Andrija Štampar“