DCNEO
Diabetes Cardiology
Nutrition Endo-Oncology

3rd Symposium on Diabetes, Cardiology, Nutrition and Endo-Oncology

Jointly held with

2nd Regional Symposium of Young Endocrinologists and Diabetologists

HYBRID EVENT

HOTEL GARDEN INN, ZAGREB
15. – 18.2.2024

www.dcneo.eu

SCIENTIFIC COMMITTEE

3rd Symposium on Diabetes, Cardiology, Nutrition and Endo-Oncology

Scientific & Organizing Committee

prof. Dario Rahelić, MD, PhD. – chair
prof. Antonio Ceriello, MD, PhD. – co-chair
prof. Zelija Velija Ašimi, MD, PhD.
prof. Sanja Klobučar, MD, PhD.
prof. Đuro Macut, MD, PhD.
prof. Tatjana Milenković, MD, PhD.

Organizing societies
Croatian Society for Diabetes and Metabolic Disorders, Croatian Medical Association
Vuk Vrhovac University Clinic for Diabetes, Endocrinology and Metabolic Diseases, Merkur University Hospital
Diabetes and Cardiovascular Disease (D&CVD) Study Group

SCIENTIFIC COMMITTEE

2nd Regional Symposium of Young Endocrinologists and Diabetologists

Scientific & Organizing Committee

prof. Zelija Velija Ašimi, MD, PhD.
prof. Azra Bureković, MD, PhD.
prof. Đuro Macut, MD, PhD.
prof. Tatjana Milenković, MD, PhD.
prof. Dario Rahelić, MD, PhD. – chair

Editor of Conference abstract book - prof. Dario Rahelić, MD, PhD.

Organizing societies

Association of endocrinologists and diabetologists in Bosnia and Herzegovina
Serbian Society for Reproductive Endocrinology
Scientific association of endocrinologists and diabetologists of Macedonia
Croatian Society for Diabetes and Metabolic Diseases

UDRUŽENJE/UDRUGA ENDOKRINOLOGA I DIJABETOLOGA U BOSNI I HERCEGOVINI
endo.ba

SRPSKO DRUŠTVO ZA REPRODUKTIVNU ENDOKRINOLOGIJU

Scientific Association of Endocrinologists and Diabetologists of Macedonia

HLZ DM DRUŠTVO ZA DIJABETES I BOLESTI METABOLIZMA

TECHNICAL ORGANIZER

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WELCOME LETTER

Dear friends and colleagues,

It is our honour and pleasure to welcome you, on behalf of Croatian Society for Diabetes and Metabolic Disorders, Croatian Medical Association, and Diabetes and Cardiovascular Disease Study Group to the 3rd Symposium on Diabetes, Cardiology, Nutrition and Endo-Oncology, held in Zagreb, 15-18 February 2024.

Holistic approach to patient health care is extremely important, especially in these challenging times. Therefore, this symposium will once again bring together top experts in the field of diabetology, endo-oncology, cardiology, and nutrition.

The programme will cover numerous important topics within diabetology, endo-oncology, cardiology, and nutrition with participants having a unique opportunity to listen to and interact with prominent experts and researchers from around Europe and gain new insights in patient health care in Croatia and beyond.

We look forward to welcoming you in Zagreb!

Prof. Dario Rahelić, MD, PhD, FACE, FACN, FRCP Edin.

2nd Regional Symposium of Young Endocrinologists and Diabetologists

PROGRAM

15.02.2024. Thursday

14:00 **Opening of the Symposium**

14:00 – 15:00 **Hypophysial diseases**
Chairpersons: T. Matić (Croatia), L. S. Kirigin Biloš (Croatia)
Invited speaker: Overview of pituitary lesions
– L.S. Kirigin Biloš (Croatia)
Case reports:
1. A case report of combined pituitary hormone deficiency caused by two different PROP1 gene mutations inherited from both parents – E. Pavlevska (North Macedonia)
2. Symptomatic diversity in Cushing's disease: A complex case report on diagnosis challenges – R. Marušić (Croatia)
3. Antipsychotic-induced hyperprolactinemia – T. Perković (Croatia)
4. Treatment of acromegaly: A case report – E. Schönberger (Croatia)
Discussion

15:00 – 16:45 **Thyroid gland diseases**
Chairpersons: T. Jukić (Croatia), K. Kljajić (Croatia)
Invited speaker: Thyroid gland disease overview – A. Piljac (Croatia)
Case reports:
1. A severe case of hyponatremia caused by hypothyroidism: A case report - N. Bozhinovska Dimova (North Macedonia)
2. Thyroid papillary carcinoma in the hot nodule – L. Romić (Croatia)
3. Extrathyroidal manifestations of Graves' disease – T. Janić (Serbia)
4. Pericardial effusion as a complication of hypothyroidism
– B. Šakić (Bosnia and Herzegovina)
5. Asymptomatic primary hyperparathyroidism - Importance of Individualized approach – Z. Šakić (Croatia)

15:45 – 16:00 **Coffee break**

6. Levothyroxine absorption test in a patient with persistently elevated thyroid stimulating hormone levels – J. Babić (Serbia)
7. Case report of parathyroid adenoma in a patient with Hashimoto's thyroiditis
– K. Cheshlaroska Markushoska (North Macedonia)

15.02.2024. Thursday

8. Dysthyroid orbitopathy after achieving euthyroidism – M. Martinović (Croatia)
9. Medullary thyroid carcinoma - case report – I. Mladenovska Stojkoska (North Macedonia)
10. Paradigm in the management of hyperparathyroidism – S. Malkočević (Bosnia and Herzegovina)
11. Hyperfunctioning thyroid nodule and thyroid papillary carcinoma – M. Dimitrovska (North Macedonia)

Discussion

16:45 – 17:30 **Gonadal diseases & PCOS**

Chairpersons: D. Herman Mahečić (Croatia), K. Kljajić (Croatia)

Invited speaker: The role of AMH in patients with PCOS – D. Herman Mahečić (Croatia)

Invited speaker: Approach to hyperandrogenism in postmenopausal women – A. Stevchevska (North Macedonia)

Case reports:

1. Ovarian Leydig cell tumor: Cause of virilisation in postmenopausal woman - A. Stevchevska (North Macedonia)
2. Complex patient with HAIR-AN syndrome and impaired quality of life – K. Krstić (Serbia)

Discussion

17:30 – 18:30 **Adrenal gland diseases**

Chairpersons: Z. Velija Ašimi (Bosnia and Herzegovina), A. Radoš Kaić (Croatia)

Invited speaker: Incidentaloma as a diagnostic challenge – A. Radoš Kaić (Croatia)

Case reports:

1. Rapidly growing adrenal gland tumor in a female patient with a history of colon cancer – B. Marković (Serbia)
2. Adrenal oncocytoma - Case report – K. D. Rudež (Croatia)
3. Subclinical Cushing syndrome – E. Nalbani Spahić (Bosnia and Herzegovina)
4. Case presentation - Primary hyperaldosteronism – P. Smeh (Croatia)
5. Bleeding in adrenal gland and pheochromocytoma – T. Petrović Nikolić (Serbia)
6. Case presentation - Type 2 polyglandular autoimmune syndrome complicated by leptospirosis – N. Radić (Serbia)

Discussion

2nd Regional Symposium of Young Endocrinologists and Diabetologists

PROGRAM

16.02.2024. Friday

09:00 – 11:00 **Diabetes & Obesity**

Chairpersons: T. Milenković (North Macedonia), Dario Rahelić (Croatia)

Invited speaker: Diabetes and obesity overview lecture
– M. Bakula (Croatia)

Invited speaker: Diabetes in childhood
– A. Feukić (Bosnia and Herzegovina)

Case reports:

1. Demographic, clinical, and laboratory characteristics of type 1 diabetes mellitus at the time of diagnosis
– A. Feukić (Bosnia and Herzegovina)
2. Metabolic syndrome and obstructive sleep apnea
– S. Šimić (Croatia)
3. Late diagnosis of latent autoimmune diabetes in adults – a case report – V. Ljimani (North Macedonia)
4. Type 2 diabetes duration is associated with enhanced inflammageing mediated by cytotoxic lymphocytes
– D. Gašparini (Croatia)
5. Management strategies for post-transplant diabetes mellitus after heart transplantation
– M. Toshevska Stefanovska (North Macedonia)
6. Honeymoon period in type 1 diabetes
– M. Šangulin Bašić (Croatia)
7. Challenges in the diagnosis and treatment of familial hypercholesterolemia – K. Steiner (Croatia)

Discussion

11:00 – 11:30 **Coffee break**

11:30 – 13:00 **Miscellaneous & Novelties in endocrinology and diabetes**

Chairpersons: Đ. Macut (Serbia), D. Rahelić (Croatia)

Invited speaker: Unraveling the impact of endocrine disruptors
– D. Ylli (Albania)

Invited speaker: Secondary osteoporosis
– B. Todorova (North Macedonia)

Case reports:

1. Case report of a patient with osteogenesis imperfecta
– B. Todorova (North Macedonia)
2. Glucagonoma syndrome – L. Radić (Serbia)
3. Persistent hyperparathyroidism – diagnostic and therapeutic dilemmas – M. Opalić Palibrk (Serbia)

PROGRAM

16.02.2024. Friday

4. Tumor-induced osteomalacia associated with tertiary hyperparathyroidism – Case Report – D. Živanović (Serbia)
5. Intrapancreatic accessory spleen: a case report – K. Kovačević (Croatia)
6. Recurrent insulinoma following surgical resection – Đ. Dronjak (Serbia)
7. Severe presentation of type 1 diabetes and autoimmune polyglandular syndrome – D. Ylli (Albania)
8. Quality of life and diabetes - L. Barišić (Croatia)

Discussion

13:00 – 14:00 **Educational workshop –** Presentation skills – J. Vora (United Kingdom)

14:00 **Lunch**

3rd Symposium on Diabetes, Cardiology, Nutrition and Endo-Oncology

PROGRAM

16.02.2024. Friday

16:00 – 17:30 **Session 1**
Chairpersons: V. Božikov (Croatia), S. Klobučar (Croatia)

16:00 – 16:20 One hour postprandial glycemia – A. Ceriello (Italy)
16:20 – 16:35 Diabetes and heart failure – D. Miličić (Croatia)
16:35 – 16:50 Targeting the core pathophysiology of MASLD/MASH: the role of immune cells – T. Turk Wensveen (Croatia)
16:50 – 17:10 Microbiota & Diabetes – A. Stoian (Romania)
17:10 – 17:25 Metabolic friendly diet – AM. Liberati Pršo (Croatia)
17:25 – 17:30 Discussion

17:30 – 18:15 **Novo Nordisk Satellite Symposium:**
Kardiometabolički učinci semaglutida
G. Mirošević, M. Deškin, N. Bićanić

18:15 – 19:00 **Eli Lilly Satellite Symposium:**
Incretins and Type 2 Diabetes
Moderator: S. Klobučar
GIP/GLP-1 receptor agonism - towards regaining the full incretin potential in T2D - M. Bakula
Mechanism of action of the novel GIP/GLP-1 receptor agonist tirzepatide– T. Bulum

19:00 – 19:30 **Medullar thyroid gland carcinoma** – Đ. Macut (Serbia)

19:30 **Opening ceremony**

3rd Symposium on Diabetes, Cardiology, Nutrition and Endo-Oncology

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17.02.2024. Saturday

08:00 – 09:00 **Session 2**
Chairpersons: Ž. Reiner (Croatia), K. Lalić (Serbia)

08:00 – 08:15 Pathophysiology of diabetic dyslipidemia – S. Ljubić (Croatia)
08:15 – 08:35 Familial hypercholesterolemia – K. Lalić (Serbia)
08:35 – 08:50 Screening for familial hypercholesterolemia in Croatia – I. Pećin (Croatia)
08:50 – 09:00 Discussion

09:00 – 10:30 **Session 3**
Chairpersons: D. Fabris Vitković (Croatia), T. Battelino (Slovenia)

09:00 – 09:20 Type 2 diabetes and CGMS– T. Battelino (Slovenia)
09:20 – 09:40 Is there a place for insulin pumps in type 2 diabetes – N. Lalić (Serbia)
09:40 – 10:00 SGLT-2 inhibitors – is there any place for another drug for the treatment of type 2 diabetes – J. Vora (United Kingdom)
10:00 – 10:15 Type 1 diabetes and cardiovascular disease – D. Jurišić Eržen (Croatia)
10:15 – 10:30 Discussion

10:30 – 11:00 **Medilab One Satellite Symposium:**

Kontinuirano mjerenje glukoze za osobe sa šećernom bolešću tipa 1 i tipa 2 – postoji li univerzalno rješenje?
D. Rahelić, D. Jurišić-Eržen, M. Radman

11:00 – 11:15 **Coffee Break**

11:15 – 12:00 **Boehringer Ingelheim Satellite Symposium:**

Challenging traditional approaches to the treatment of MCR disorders
Moderator: D. Rahelić

Challenging traditional approaches to the treatment of MCR disorders – intro
D. Rahelić

Connecting the dots: CKD in MCR continuum
K. Kljajić

Empagliflozin: Who and when?
S. Klobučar

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PROGRAM

17.02.2024. Saturday

12:00 - 13:00	**Session 4** **Chairpersons: A. Ylli (Albania), T. Milenković (North Macedonia)**
12:00 – 12:15	Prehabilitation of patients with cancer – M. Berković Cigrovski (Croatia)
12:15 – 12:30	Cushing syndrome – I. Bilić Ćurčić (Croatia)
12:30 – 12:45	Endocrinological side effects of immunotherapy of malignant diseases – S. Canecki Varžić (Croatia)
12:45 – 13:00	Discussion
13:00 – 13:30	**Abbott ANI Satellite Symposium:** **The vicious cycle of diabetes and skeletal muscle atrophy** I. Mikolašević
13:30 – 14:00	**Berlin Chemie Satellite Symposium:** **Subanaliza ispitivanja ENGAGE AF TIMI-48 – AF: bolesnici s AF-om i dijabetesom** S. Vučković Rebrina
14:00 – 15:00	**Lunch**
15:00 – 16:50	**Session 5** **Chairpersons: Z. Velija Ašimi (Bosnia and Herzegovina), T. Jukić (Croatia)**
15:00 – 15:15	MEN and case report – G. Mirošević, M. Strinović (Croatia)
15:15 – 15:35	Secondary hypertension – Z. Velija Ašimi (Bosnia and Herzegovina)
15:35 – 15:50	Malignant pheochromocytoma – T. Matić (Croatia)
15:50 – 16:05	Paraganglioma – M. Radman (Croatia)
16:05 – 16:20	Thyroid nodules – diagnostic challenges – K. Kljajić (Croatia)
16:20 – 16:35	Treatment options of differentiated thyroid cancer – T. Jukić (Croatia)
16:35 – 16:50	Discussion
16:50 – 18:15	**Session 6** **Chairpersons: M. Jandrić Balen (Croatia), S. Klobučar (Croatia)**
16:50 – 17:05	Type 1 diabetes and obesity – S. Klobučar (Croatia)
17:05 – 17:25	Novel treatments for obesity – T. Milenković (North Macedonia)
17:25 – 17:40	Is TIR a new indicator of good glycemic control – M. Grgurević (Croatia)
17:40 – 17:55	Diabetic cardiomyopathy: From mechanisms to clinical practice – T. Tičinović Kurir (Croatia)
17:55 – 18:15	Discussion

PROGRAM

18.02.2024. Sunday

09:00 – 11:00	**Session 7** **Chairpersons: T. Milenković (North Macedonia), D. Rahelić (Croatia)**
09:00 – 09:20	Current guidelines in the treatment of type 2 diabetes – F. Giorgino (Italy)
09:20 – 09:35	Analysis of new clinical trials in diabetes – M. Skelin (Croatia)
09:35 – 09:55	Novelties in the treatment of diabetes and chronic kidney disease – B. Jelaković (Croatia)
09:55 – 10:15	Novelties in diabetes type 2 treatment – B. Timar (Romania)
10:15 – 10:30	Weight variability as a cardiovascular risk factor – D. Rahelić (Croatia)
10:30 – 10:45	Discussion
10:45	**Closing remarks**

SPEAKERS

Prof. Zelija Velija Ašimi

Professor Zelija Velija Ašimi is a specialist in internal medicine and a subspecialist in endocrinology and diabetology. She is the president of the Association of endocrinologists and diabetologists in Bosnia and Herzegovina since 2016.

She is a member of the American College of Endocrinology (FACE) and a member of the Membership Committee of the European Society of Endocrinology (ESE 2020-2024).

She currently works as the director of the Polyclinic UniMed - SSST University in Sarajevo and as a full professor of internal medicine and endocrinology at the Faculty of Medicine in Sarajevo, SSST University. From 2013 to 2019, she worked as an associate professor at the Department of Internal Medicine - subject Endocrinology and Diabetology, Faculty of Medicine, University of Sarajevo. From 2005 to 2017, Professor Velija Ašimi worked at the Clinical Center of the University of Sarajevo as the head of the Diagnostic-Polyclinic Department of the Clinic for Endocrinology and Diabetes.

She is the author of many peer-reviewed books, university textbooks, peer-reviewed guides, and many scientific and professional works. In the field of endocrinology, she reviewed more than 40 scientific papers for journals such as Endocrine, Frontiers of Endocrinology, Journal of International Medical Research, Pathophysiology.

Professor Zelija Velija Asimi participated in numerous scientific projects and educations. She completed professional training in health management. She is a member of several professional and scientific societies, such as the European Society of Endocrinology (ESE), the American Association of Clinical Endocrinology (AACE), the European Association for the Study of Diabetes (EASD) and the International Diabetes Federation (IDF).

Tadej Battelino, M.D., Ph.D.

Professor Tadej Battelino, an accomplished endocrinologist, received his medical degree and aPhD in neonatal glucose metabolism from the University of Ljubljana. His further training included a clinical fellowship at Loyola University of Chicago and a post-doctoral fellowship at INSERM, Paris. He currently heads the Department of Pediatric and Adolescent Endocrinology at University Medical Centre, Ljubljana, and holds professorships at the University of Ljubljana. His research in diabetes and endocrinology has earned him numerous accolades, including:

- the Slovene national award (2014),
- Gold Medal from the University of Ljubljana (2017),
- ISPAD Achievement Award (2020), and
- the Presidential Medal from the Children with Diabetes society (2022).

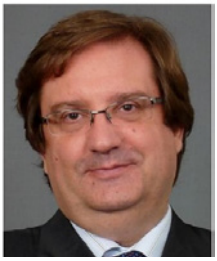
Battelino has served on several editorial boards, and is an active member of prominent endocrinology societies, including a presidential role at the 35th ISPAD Congress. He's affiliated with ADA and ESPE, and is an honorary member of SIEDP and EEPEE. Since December 2022, he has served as Regional Chair-Elect at IDF Europe.

Silvija Canecki-Varžić, M.D., Ph.D.

Assistant Professor Silvija Canecki-Varžić is an accomplished endocrinologist and diabetologist, with a 25-year career combining clinical work, academic contributions, and substantial research. A University of Zagreb graduate, she specialized in internal medicine at Clinical Hospital Osijek, focusing on endocrinology and diabetology. Currently, she heads the Clinic for Internal Diseases and Department for Endocrinology at University Hospital Center Osijek and serves as Assistant Professor at J. J. Strossmayer University. Her robust research portfolio spans diabetes, obesity, and endocrine disorders. She's mentored numerous postgraduate students and participated in multiple clinical trials, contributing to novel drug development. A frequent contributor to scientific literature and symposia, she's the president of the Croatian Society of Endocrinology and a board member of the Croatian Society of Diabetology and Metabolic Disorders, and serves on national councils for diabetes strategy.

Prof. Ines Bilić-Ćurčić

Ines Bilić-Ćurčić is an Associate Professor, Vice Dean for Postgraduate studies at the Faculty of Medicine in Osijek, and attending physician at University Hospital Osijek in the Department of Endocrinology. She graduated from the Faculty of Medicine in Osijek, the University of Zagreb in 2003 with an M.D. From the Postgraduate study in biomedicine, Faculty of Medicine, the University of Osijek with a Ph.D. in 2006. From 2003 to 2005 she was a postdoctoral fellow at the Department of Genetics and Developmental Biology, University of Connecticut Health Center, the USA acquiring the experience and skills necessary for research and lab work. Since 2005 she has also been working at the University of Osijek, Faculty of Medicine, in various positions ranging from associate Junior Assistant to part-time Associate Professor. In May 2021 she was appointed the Head of the Department of Pharmacology and in October 2021 she was appointed Vice Dean for Postgraduate studies. Currently, she is the principal investigator of several research projects: "The influence of replacement therapy for hypothyroidism and hyperthyroidism on bone metabolism"; „Molecular mechanisms of the renoprotective effect of empagliflozin and liraglutide in a cell culture model of human proximal tubule cells"; „Incidence of hypoglycemia after strength training and aerobic exercise in patients with type 1 diabetes" etc. She is a lecturer in Pharmacology courses for undergraduate medical and biomedical laboratory diagnostics students and Ph.D. students. Her field of interest is basic and clinical endocrinology, specifically bone and metabolic disorders and the prevention of complications. She actively publishes original research work and serves as a reviewer for several scientific journals and international research projects.



Prof. Antonio Ceriello

Professor Antonio Ceriello is Research Consultant at IRCCS MultiMedica, Milan, Italy and Adjunt Professor of Internal Medicine at the "Luigi Vanvitelli University" of Naples, Italy. From January 2010 until June 2020 he was Principal Investigator at the Institut d'Investigacions Biomèdiques August Pi i Sunyer (IDIBAPS), Barcelona, Spain. From March 2016 to December 2022 he was Head of Diabetes Department at IRCCS MultiMedica, Milan, Italy. From April 2006 to December 2009 he was Professor of Endocrinology at the University of Warwick, UK. From 1990 until March 2006 he was Chair of Endocrinology and Director of the School of Specialty in Geriatrics at the University of Udine, Italy. From 2004 to 2006 he also was Adjunct Professor of Internal Medicine at the Oklahoma City University, U.S.A.

Professor Ceriello has widely published in diabetes, with over 550 original papers and several book chapters. His current h-index is 122 for Google Scholar and 100 for SCOPUS. Prof Ceriello has been consultant of the National Institutes of Health, U.S.A. for the program of the research 2003-2005, related to cardiovascular disease and type 1 diabetes, and member of the writing committee of the American Heart Association of the guidelines on "Acute Hyperglycemia and Acute Coronary Syndromes". He has also chaired the International Diabetes Federation (IDF) committee for the development in 2008, and in the 2011 for the update of "Guideline for Management of Postmeal Glucose ". Currently, he is the Chairman of the "Diabetes and Cardiovascular Diseases (D&CVD)" a Reference Study Group of the European Association for the Study of Diabetes (EASD). He also served as Review of the 2012 "European Guidelines on Cardiovascular Disease Prevention in Clinical Practice" and for the 2013 "European Society of Cardiology (ESC) guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD ". He has also been a Member of the Board for the development of the "2019 European Society of Cardiology (ESC) guidelines on diabetes, pre-diabetes, and cardiovascular diseases developed in collaboration with the EASD "and of the 2022 ADA, ADCES, EASD, ISPAD, JDS, JDRF International Consensus on "Continuous Glucose Monitoring (CGM) Metrics for Clinical Trials". From 2009 to 2012 he has been member of the Board of the IDF Europe and Consultant of the EU Commission for the Framework "Diabetes as a model of chronic care management". He served as Referee of the European Commission for the 2017 grant program related to the HORIZON 2020 Program. From 2013 to 2015 he has been the President of the Associazione Medici Diabetologi (AMD), and from 2015 to 2017 President of the AMD Foundation. He also served as Associate Editor of "Diabetes Care" from 2003 to 2011 and Associate Editor of "Diabetic Medicine" from 2005 to 2016. From July 1st 2016 he has been appointed as Editor in Chief of "Diabetes Research and Clinical Practice", the official IDF journal. Currently he is also in the Editorial Board of "Cardiovascular Diabetology". Prof. Ceriello is the winner in the 1984 of the "Italian Annual Award for Young Researcher", in the 1990 of the "Italian National Award for Research on the Pathophysiology of Diabetic Complications", in the 1998 of the "National Award Italian Society of Diabetology", in the 2004 of the "Camillo Golgi Prize" of the EASD, in the 2017 of the "Hellmut Mehnert Award", during the 2017 IDF Meeting, in the 2022 of the "Aretaeus Lecture Award" from the Hellenic Society of Diabetology and in 2023 of the "Somogyi Award" from the Hungarian Diabetes Association.

Prof. Ceriello is Special Advisor to the Board of IDF Europe (Advocacy and Publications) for 2023-2024.

Prof. Ceriello has also been appointed by IDF as Co-Chairman for the development of the "2024 Guidelines for the management of type 2 diabetes in different settings" and as Chairman for the 2025 IDF World Congress. He has also co-chaired the IDF-ISN policy brief on diabetic nephropathy and representing the IDF in the "Global action for developing a research and action roadmap for fatty liver disease".

Daniela Fabris-Vitković, MD

I am a specialist in internal medicine, an endocrinologist, and a diabetologist. Since 2016, I have been Head of the Internal Medicine Service and Head of the Department of Endocrinology and Diabology at the Pula General Hospital. I am an executive committee member of the Croatian Endocrine Society and a member of the Croatian Society for Diabetes and Metabolic Disorders and the Croatian Society for Obesity of the Croatian Medical Association. I was an invited speaker at many Croatian conferences. I am an associate assistant in the field of clinical medical science at the Juraj Dobrila University of Pula School of Medicine.

Mladen Grgurević

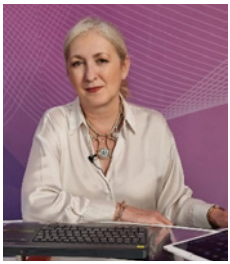
Mladen Grgurević completed his medical degree at the University of Zagreb in 2005. He is a specialist of internal medicine, endocrinologist and diabetologist.

He completed PhD degree focusing on depression and glycaemic control among people with diabetes in 2020. He is the author and co-author of several scientific and professional papers and conference abstracts in the field of diabetology and is also a member of the Croatian Society for Diabetes and Metabolic Diseases and the European Association for the Study of Diabetes (EASD).

He is working at the University Clinic Vuk Vrhovac, Merkur Clinical Hospital, Zagreb with a special interest in intensive insulin treatment, the use of insulin pumps and sensors for continuous glucose measurement (CSII, CGM, AHCL), from which he was in professional and clinical training at several foreign institution (General University Hospital In Prague, 3rd Internal Clinic, Prague, Czech Republic; Center for Diabetes and Metabolism – Fachklinik – Bad Heilbrunn, Germany).

Dr. Sanja Klobucar

Dr. Sanja Klobucar completed her medical studies in Rijeka, Croatia. She completed her training in internal medicine at the Clinical Hospital Centre Rijeka, Croatia, where she also completed a fellowship in endocrinology and diabetology. Dr. Klobucar is an associate professor of internal medicine and Head of the Diabetes and Obesity Outpatient Clinic at the Clinical Hospital Centre Rijeka, Croatia. She is currently Vice President of the Croatian Society for Diabetes and Metabolic Disorders and Vice President of the Croatian Society for Obesity. Her main interests are prevention and treatment of diabetes and obesity management. She was part of the multidisciplinary team involved in the first implantation of an electrical gastric stimulator in a patient with severe diabetic gastroparesis in Southeastern Europe. Dr. Klobucar received the Etzwiler International Scholar Award, Class of 2018, and has been a visiting physician at the Mayo Clinic in Rochester (USA), Cluj-Napoca University Hospital (Romania), and University Medical Centre Ljubljana (Slovenia).



Prof. Dr. Katarina Lalic

Prof. Dr. Katarina Lalic is a specialist in internal medicine, subspecialist endocrinologist. She graduated from the Faculty of Medicine of the University of Belgrade in 1987, and her doctoral dissertation in the field of endocrinology at the same faculty in 2002. Since 2018, he has been a full professor at the Department of Internal Medicine at the Faculty of Medicine in Belgrade. Since 2012, he has been the head of the Department for Lipid Disorders of the Clinic for Endocrinology, Diabetes and Metabolic Diseases UKCS. The dominant areas of research that Dr. Lalić deals with are disorders of lipid metabolism, diabetes, insulin resistance and cardiovascular diseases. She was an invited lecturer at numerous domestic and international congresses, and is a reviewer in several domestic and international scientific journals. So far, she has been the author and co-author of more than 300 publications, including more than 80 international scientific journals. Dr Lalić is a member of several professional organizations and associations, including EASD, ADA, EAS, ESC.

Nebojša M. Lalić, MD, PhD, FRCP

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Professor Lalic is very active in advocacy for the people with diabetes, not only through promotional activities but also through initiating the changes that improved the delivery of diabetes care. Also, he is leader of the nationwide program of diabetes education (more than 5000 participants/last 5 years). In addition, he is extensively involved in the updating of national and international, including IDF guidelines. Professor Lalic has been Chair of the national expert committee for diabetes from 2002.

From 2015 he has been member of the Board of the IDF Europe, 2019 he became Chair elect of IDF Europe, and now, from 2022, he serves as Chair of IDF European Region.

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His research interests are related to reproductive endocrinology with special focus on polycystic ovary syndrome (PCOS) and insulin resistance, as well to neuroendocrinology and neuroendocrine tumors. He is author or co-author of over 130 original papers published in peer-reviewed international journals, and the editor of two international monographs, on PCOS and non-classical congenital adrenal hyperplasia (NCAH) published by Karger and Frontiers.

Professor Macut is an Associate Editor of international journals Hormones and Endocrine.

Since 2016 is serving in different Committees of the European Society of Endocrinology (ESE). He was representative of the ESE Council of Affiliated Societies (ECAS) at the ESE Executive Committee (ex-officio, 2016-2020), and from 2020 is elected member of the ESE Executive Committee and ESE Treasurer. He was a member of the Program Organizing Committees of the 19th, 20th and 25th European Congress of Endocrinology (ECE) in Lisbon (2017), Barcelona (2018) and Istanbul (2023) as well forthcoming 26th ECE in Stockholm.
Dr Macut is president of the Serbian Society for Reproductive Endocrinology, founder and organizer of the International Symposium on Advances in PCOS and Women's Health since 2012, and Belgrade Masterclass in Clinical Endocrinology, Diabetes and Metabolism since 2019.

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Ass. prof. Dario Rahelic, MD, PhD, FACE, FACN, FRCP Edin.

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Francesco Giorgino is Professor of Endocrinology and Chairman of the Department of Precision and Regenerative Medicine and Ionian Area at the University of Bari Aldo Moro, Bari, Italy. He is also Chief of the Division of Endocrinology at the University Hospital Policlinico Consorziale in Bari. Professor Giorgino received his M.D. degree from the University of Bari Aldo Moro and his Ph.D. degree from the University of Naples Federico II, in Italy. After completing clinical training in endocrinology at the University of Catania, Italy, he worked at the Joslin Diabetes Center and Harvard Medical School in Boston, MA, USA, as a postdoctoral research fellow and visiting scientist (1990-1994).

Professor Giorgino has received scientific awards from various institutions, including the Juvenile Diabetes Research Foundation International (JDRF) Fellowship (New York, NY, USA), the Mary K. Iacocca Foundation Fellowship (Boston, MA, USA), the Glaxo-Wellcome Award from the European Association for the Study of Diabetes (EASD), the Aldo Pinchera and Cassano Awards from the Italian Society of Endocrinology, and the Alcmeone Award from the Italian Society of Diabetology. He has been the Italian Delegate in European Commission Cooperation in Science and Technology (COST) actions for diabetes, has been President of the Italian Society of Endocrinology (2019-2021), and is currently Senior Vice-President of the European Association for the Study of Diabetes.

He is or has been a member of the Editorial Boards for PLoS ONE, Journal of Endocrinology, Endocrinology, Journal of Endocrinological Investigation, Adipocyte, Acta Diabetologica, Cardiorenal Medicine, and Diabetes Metabolism Research and Reviews. He has published more than 300 original and review articles and has been an invited speaker at many national and international meetings. His research interests include the mechanisms of insulin resistance and beta-cell dysfunction in type 2 diabetes and the effects of diabetes drugs on pancreatic islets and the cardiovascular system. He has an H-index of 68 and 17,300 citations (Google Scholar).

Professor Jiten Vora, BA, MB.B.Chir, MD, MA, FRCP

Jiten Vora is a Consultant Physician/ Professor at the Liverpool University Hospitals and the University of Liverpool. Professor Vora has also been Chief Medical Advisor for Cardiovascular, Renal and Metabolic Diseases at AstraZeneca. He qualified at the University of Cambridge, before completing substantive training in diabetes and endocrinology at the University of Wales College of Medicine. He was also a Fulbright Senior Fellow at Oregon Health Sciences University, Portland, USA.

Professor Vora has research interests in the development, screening, and treatment of diabetic retinopathy, in renal hemodynamics and hypertension in Type 2 diabetes, in the prevention of renal diseases in diabetes, in the physiological aspects of treatment of Type 2 diabetes, and in mechanisms of osteoporosis. He has published extensively in the field of diabetes, and co-authored several textbooks concerning the management of diabetes.

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ABSTRACTS

Hypophyseal diseases

A case report of combined pituitary hormone deficiency caused by two different PROP1 gene mutations inherited from both parents

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We present a case of an 18-year-old boy on hormone substitution therapy due to primary hypopituitarism. At the age of 9, due to diplopia, the patient underwent an MRI of the pituitary gland with the finding of a 10 mm formation in the sella turcica resembling a Rathke's cyst. Hypothyroidism was diagnosed based on hormone analyses and administration of levothyroxine was started. The patient had short stature with a height of less than 3 SD below normal. Two tests for growth hormone deficiency were performed - catapressan and levodopa, the same in addition to absolute growth hormone deficiency. Additionally, due to initially low basal cortisol values and normal ACTH, both ACTH- and CRH tests were performed with results in support of reduced cortisol secretion. Multiple hormone deficiency was suspected and a TRH test was performed with an absolute lack of thyroid stimulating hormone. After obtaining such results, growth hormone and hydrocortisone were added to the patient's therapy regimen. Four years later, due to immeasurably low values of gonadal axis hormones, an LHRH test was conducted in the direction of hypogonadotropic hypogonadism. The patient was placed on human chorionic gonadotropin therapy. With all the results taken into account, the question of a possible genetic causality was raised. Genetic testing revealed that the patient is heterozygous for 2 pathogenic variants in the PROP1 gene: c.358C>T inherited from the mother and c.301_302del inherited from the father. Both pathogenic variants of this gene have been observed in patients with combined deficiency of pituitary hormones - type 2. The patient is currently on a regular dose of maintenance with growth hormone, levothyroxine, hydrocortisone and testosterone. The purpose of presenting this case is to raise awareness of the search for a genetic etiology for panhypopituitarism in cases of primary hypothyroidism combined with growth hormone deficiency.

Symptomatic diversity in Cushing's disease: A complex case report on diagnosis challenges

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Introduction: Cushing's disease is characterized by excessive cortisol production due to increased levels of adrenocorticotropic hormone (ACTH), primarily attributed to the presence of an adrenocorticotropic tumor in the pituitary gland. Prompt intervention is imperative, given that untreated Cushing's disease can precipitate severe complications such as cardiovascular issues and osteoporosis.

Case report: We present a 70-year-old patient who has known arterial hypertension and diabetes for a long time. At the age of 44, she underwent gastric resection for a gastrointestinal stromal tumor and a partial liver resection due to focal nodular hyperplasia. The patient sought medical attention for frequent headaches, leading to a CT scan that detected an expansive formation in the sella turcica. Subsequent MRI revealed a deformed sella measuring 26 mm in diameter and 18 mm transversely, displacing the sella and infundibulum upwards with moderate postcontrast opacification. Endocrinological examination confirmed partial hypopituitarism, specifically gonadotropic and thyrotropic insufficiency. Additionally, the overnight and low-dose dexamethasone suppression tests showed no suppression, and ACTH values of 11.7 pmol/L were recorded, indicating Cushing's disease. Given that the patient did not have any symptoms of hypercorticism, the intravenous dexamethasone suppression test was conducted, conclusively confirming the diagnosis of Cushing's disease. The patient underwent a transsphenoidal adenomectomy, and the pathophysiological diagnosis confirmed the presence of a corticotroph tumor.

Conclusion: Diagnosing Cushing's disease poses a significant challenge, especially when symptoms deviate from the typical presentation. Active exclusion of this diagnosis becomes crucial when a pituitary incidentaloma has been identified, especially in patients with concurrent comorbidities.

Antipsychotic-induced hyperprolactinemia

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Hyperprolactinemia is a common side effect in the treatment of antipsychotics and depends on the pharmacological profile of the antipsychotic, the dosage of the medication, as well as the gender and age of the patient. An increase in prolactin concentration can be observed even at lower doses within a few hours of starting treatment, and a tenfold increase in prolactin concentration is possible within three to nine weeks. After discontinuation of antipsychotic use, prolactin concentrations can normalize within three weeks. Clinically, hyperprolactinemia manifests as galactorrhea, amenorrhea, ovarian dysfunction, infertility, atrophy of the mucous membrane of the urethra and vagina, dyspareunia, acne, hirsutism, and sexual dysfunction.

A case is presented of a 48-year-old patient referred for endocrinological examination due to nocturnal awakenings accompanied by palpitations, sweating, and tremors. Among other complaints, she mentions fatigue and dizziness, as well as the absence of one menstrual cycle. She has not had any serious illnesses in the past; she was recently examined by a neurologist and a psychiatrist. She has been taking alprazolam, sertraline, and sulpiride (for the past month). Holter monitoring, continuous blood pressure monitoring, and Doppler ultrasound of carotid and vertebral arteries were performed, with no particular findings. Thyroid ultrasound described some criteria for diffuse thyroid disease with minor nodular lesions in the right lobe. Laboratory findings revealed hyperprolactinemia (prolactin 3902 mIU/L), dyslipidemia, and vitamin D deficiency. Sulpiride was discontinued from the therapy, and she was scheduled for further evaluation in two weeks. Repeat laboratory findings showed normal concentrations of prolactin, cortisol, and sex hormones, and the patient reported subjective improvement.

In conclusion, antipsychotics such as sulpiride are often associated with the side effects of hyperprolactinemia. Patients on antipsychotic therapy should be regularly monitored for potential effects on fertility and for the preservation of their mental health.

Keywords: hyperprolactinemia, side effect, antipsychotic, sulpiride

Liječenje akromegalije: prikaz slučaja

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U ovom prikazu opisan je slučaj 41-godišnjeg bolesnika koji desetak godina ima arterijsku hipertenziju i šećernu bolest tip 2 koja je dobro regulirana terapijom oralnim antidijabeticima. Unatrag pet godina primijetio je povećanje šaka i stopala kao i neke promjene u crtama lica zbog čega je upućen na pregled endokrinologa. Učinjena je inicijalna laboratorijska obrada kojom su zabilježene povišene vrijednosti prolaktina i inzulinu sličnog faktora rasta 1 (IGF-1) koji je iznosio 174,74 nmol/l te snižene vrijednosti testosterona. Hormon rasta (HR) bio je nesupresibilan u oralnom testu tolerancije glukoze (OGTT). MR-om hipofize prikazan je lijevi dio sele ispunjen ekspanzivnim tumorom hipofize, najvećeg promjera 2 cm te je učinjena transsfenoidalna resekcija tumora. Tri mjeseca postoperativno učinjena je hormonska reevaulacija – prate se povišene vrijednosti IGF-1 49,44 nmol/l, ali uz urednu supresiju HR-a, a zbog sniženih vrijednosti testosterona uveden je testosterondekanoat. Na kontrolnom MR-u hipofize nije bilo znakova rezidualnog ili rekurentnog tumora. Iako je u nekoliko navrata zabilježen povišen IGF-1, tek je devet mjeseci postoperativno na MR-u hipofize 3T vizualiziran rezidualni makroadenom 7x3 mm. Odlukom multidisciplinarnog tima, provedena je adjuvantna radioterapija Gama-nožem nakon koje su i dalje perzistirale povišene vrijednosti IGF-1. U nastavku liječenja u terapiju je uveden oktreotid LAR uz što se prate vrijednosti IGF-1 na gornjoj granici te je potrebno daljnje redovito praćenje radi odluke o eventualnom dodatnom uvođenju kabergolina. Akromegalija predstavlja izazov u liječenju s obzirom da trećina bolesnika nakon neurokirurškog liječenja ima rezidualni adenom, stoga su redovito praćenje bolesnika i izbor optimalne terapije ključni kako ne bi došlo do komplikacija bolesti.

Thyroid gland diseases

Thyroid gland disease overview

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Thyroid diseases are among the most common endocrinological diseases. In the general population, more than 10% of people suffer from some form of thyroid disease. They are more common in women and the elderly. Thyroid diseases can be classified based on different criteria such as etiology or pathophysiology. Thyroid diseases include hypothyroidism, hyperthyroidism, goiter, thyroiditis and thyroid cancer. Risk factors for the development of thyroid disease are gender, age, positive family history, the presence of other autoimmune diseases and radiation of the neck. The most common causes of hypothyroidism are autoimmune disease (Hashimoto's), iodine deficiency, inflammation of the thyroid gland, surgery, medications and damage to the pituitary gland. The main causes of hyperthyroidism are also autoimmune disease (Graves), thyroid nodules, thyroid inflammation and medications. Goiter is the result of a lack of iodine, today less often as a result of a lack of dietary intake (iodization of salt), more often as a result of an autoimmune disease. Thyroid inflammations are divided into acute, subacute and chronic. Acute ones are extremely rare, and arise when the thyroid and pharynx communicate (fistula or open ductus thyreoglossus). Subacute or granulomatous, de Quervain's thyroiditis is the most common cause for a painful thyroid, and the causative agents are various thyrotropic viruses. In chronic inflammation of the thyroid, we primarily think of Hashimoto's disease, but there is also extremely rare Riedle's thyroiditis, of unknown etiology, which is characterized by the replacement of thyroid parenchyma by fibrous tissue. Thyroid carcinomas manifest as thyroid nodules. Most often, they are without symptoms, although they can also present with non-specific symptoms such as difficulty swallowing, neck swelling or hoarseness. They are diagnosed by cytological puncture and confirmed by pathohistological analysis. The most common is papillary carcinoma (80%), then follicular carcinoma (10%), medullary carcinoma (5%), anaplastic (3%), others (1%, e.g. lymphoma, fibrosarcoma, metastases).

A severe case of hyponatremia caused by hypothyroidism: A case report

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Male patient, aged 36, with medical history of hypothyroidism induced myopathy, and consequent rhabdomyolysis and acute kidney failure, was hospitalized at the intensive care unit (ICU). Initially, the laboratory findings showed severe hypothyroidism, followed by severe hyponatremia and hyperkalemia.

The patient was drowsy, but alert. He complained of scrotal pain, and while the ultrasound was unremarkable, his testosterone levels were significantly low, as well. Substitution therapy with levothyroxine (L-T4) was immediately started, per protocol. The sodium levels were constantly lowering, despite the intensive administration of sodium chloride. In the midst of the patient's lowest sodium levels, he had an episode of headache, nausea, vomiting (elevated intracranial pressure), and hypothermia. Along the L-T4 therapy, fluid restriction treatment was initiated. Furthermore, it was discovered that the patient's serum osmolality was low, but his urine osmolality and urine electrolytes were all within the normal ranges - (euvolemic hypotonic hyponatremia).

As his fT4 levels started to improve, his overall clinical condition exceeded significantly, his testosterone levels started to improve, and the scrotal pain disappeared as well.

THYROID PAPILLARY CARCINOMA IN THE HOT NODULE

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ABSTRACT: Papillary carcinoma is the most common thyroid cancer in adults and children, and the diagnosis is made based on thyroid ultrasound and FNA. Ultrasound criteria for FNA according to ATA guidelines are solid and hypoechoic nodules that are ≥1 cm. They are highly suspicious for malignancy if they have additional features such as microcalcifications, irregular margins, taller-than-wide shape, rim calcifications, increased blood flow, and extrathyroidal extension. If the serum concentration of thyrotropin is suppressed, there is a high possibility that the nodule is autonomous and it is necessary to perform thyroid scintigraphy. By scintigraphy, autonomous nodes accumulate radiopharmaceuticals more strongly than the surrounding thyroid tissue (the so-called hot nodes). Hot nodes are mostly benign, however, research has shown that in rare cases there is still a possibility of malignancy. A scintigraphic hot nodule with a regular FNA finding can be treated with radioiodine ablation or surgery. The basis of treatment for papillary thyroid cancer is total thyroidectomy and 4 weeks after the operation, it is necessary to perform radioiodine ablation of the remaining thyroid tissue.
We present the case of a 60-year-old female patient referred by the general practitioner for the first examination of an endocrinologist due to a suppressed serum concentration of thyrotropin. The initial finding of TSH was 0.12 mIU/L with normal peripheral thyroid hormones. Thyroid ultrasound showed an associated, inhomogeneous nodule measuring 22x17x21 mm with macrocalcifications in the lower third of the right lobe, diffusely perfused with color Doppler. Thyroid hormone control was performed and the suppressed serum concentration of TSH was still visible, which now amounted to 0.06 mIU/L, with normal peripheral thyroid hormones still visible. Due to the symptoms of hyperthyreosis, thyrostatic therapy was introduced and thyroid scintigraphy was performed, which showed a scintigraphically hot nodule in the lower third of the right thyroid lobe. FNA of the mentioned node verified papillary proliferation of thyroid cells (Bethesda V) and repeated FNA with the addition of immunocytochemistry confirmed the diagnosis of papillary thyroid carcinoma. The patient was referred for an ENT examination to agree on a total thyroidectomy.

Keywords: papillary carcinoma, hot nodule, scintigraphy, hyperthyreosis, total thyroidectomy

Ekstratiroidne manifestcije Grejvsove bolesti

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Grejvsova bolest je autoimunska bolest koja, pored štitaste žlezde, može zahvatiti i druge organe i tkiva. U zavisnosti od intenziteta imunskog odgovora, pored hipertiroidizma, može se javiti orbitopatija, dermatopatija i akropatija. Dermatopatija je retka ekstratiroidna manifestacija, skoro uvek je povezana sa orbitopatijom (96%) i obično se javlja nakon očnih promena. Njena prevalenca je 0.5-4.3%, dok se u 13-15% javlja udružena sa teškom formom orbitopatije. Pacijentkinja 62 godine, hospitalizovana na Klinici za endokrinilogiju UKCS zbog distiroidne orbitopatije. Njena bolest prezentovala se 2010.g. najpre dermopatijom u vidu otoka i hiperemije potkolenica i stopala. Očne tegobe razvile su mesec dana kasnije, kada je i postavljena dijagnoza hipertireoze. Lečena je medikamentno, a zatim 2012.g. učinjena totalna tiroidektomija. Dermopatija je vremenom progredirala u retku formu-elefantijazu, dok je nalaz na očima od početka bolesti bio stacionaran do 2021.g. kada se registruje pogoršanje orbitopatije uz nagli pad vidne oštrine i poremećaj kolornog vida. Tokom hospitalizacije, zbog teške orbitopatije najpre lečena po protokolu za medikamentnu dekompresiju, aplikacijom metilprednisolona (MP) 3x1 gr, a zatim nastavljeno sa standardnim 12-nedeljnim protokolom (MP 6x500mg + 6x250mg). Postterapijski bez značajnijeg efekta (kratkotrajno delimično poboljšanje vizusa) zbog čega je lečenje nastavljeno primenom tocilizumaba. Tocilizumab je doveo do značajnog smanjenja aktivnosti i težine Grejvsove orbitopatije u ovom slučaju rezistentne na kortikosteroide. Pored opisanih povoljnih efekata na orbitopatiju, odlično se pokazao i u tretmanu distiroidne dermatopatije, za šta do sada nisu rađene studije. Kod naše pacijentkinje viđeno je značajno smanjenje edema potkolenica i stopala, razmekšanje kalcifikovanog potkožnog tkiva i kože i povećanje obima pokreta u zglobovima.

Pericardial effusion as a complication of hypothyroidism

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Hypothyroidism is an endocrine disorder characterized by low or absent thyroid hormones, which affects multiple organs and leads to various complications. The clinical picture of hypothyroidism can vary from asymptomatic patients with subclinical disorders to multiorgan failure. The most common symptoms of hypothyroidism are weight gain, constipation, sensitivity to cold, fatigue and dry skin. One of the rarer but more serious complications of hypothyroidism is pericardial effusion. This case report is about a patient who was treated for hypothyroidism with levothyroxine for 5 years, initially at a dose of 25 mcg, which was gradually increased to 100 mcg. She stopped using therapy on her own initiative because she felt well. Six months after the discontinuation of the therapy, she appears due to weakness, fatigue, chest pains that worsen when breathing.

An enlarged shadow of the heart is verified on the X-ray image, and in laboratory tests extremely high values of TSH >47.70 uIU/ml (ref 0.38-5.33), with low values of FT3 2.30 pmol/L (ref 3.80-6 .70) and FT4 2.10 pmol/L (ref 7.90-14.40). Echocardiography also diagnoses a pericardial effusion that leads to the collapse of the right atrium in systole. Replacement therapy with levothyroxine, glucocorticoids, non-steroidal anti-inflammatory drugs is prescribed, which improves the general condition of the patients and stabilizes the hormonal status. Because this complication of hypothyroidism can lead to hemodynamic instability and progress to life-threatening conditions such as cardiac tamponade, early diagnosis and treatment of pericardial effusion in hypothyroidism is essential.

Asimptomatski primarni hiperparatireoidizam - važnost individualiziranog pristupa

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Uvod: Primarni hiperparatireoidizam (PHPT) najčešća je osnovna etiologija hiperkalcemije, odgovarajući za otprilike 90% svih slučajeva. Ovaj poremećaj karakterizira pojačana funkcija doštitnih žlijezdi koja rezultira viškom lučenja paratireoidnog hormona (PTH) što dovodi do povišene serumske koncentracije kalcija putem njegove mobilizacije iz kostiju. Klasična prezentacija PHPT uključuje osteoporozu, nefrolitijazu, bolove u mišićima i psihičke poremećaje. Međutim, tijekom posljednjih nekoliko desetljeća, incidencija klasično simptomatske bolesti opada te se većina bolesnika s PHPT često slučajno identificira putem rutinskih laboratorijskih pretraga. Ovaj prikaz slučaja pružit će uvid u dijagnostičke i terapijske izazove povezane s PHPT kod asimptomatske 35-godišnje bolesnice. Prikaz slučaja: Bolesnica u dobi od 35 godina je inicijalno bila pod endokrinološkom kontrolom zbog oligomenoreje i sumnje na inzulinsku rezistenciju. U sklopu opširne obrade, na UZV vrata prikazana je hipoehogena, oštro ograničena, tvorba ispod donjeg pola desnog režnja štitnjače nakon čega su određene serumske koncentracije PTH i kalcija koje su pristigle povišene. PTH u aspiratu je bio negativan, a scintigrafski nalaz bez nakupljanja Tc-99 MIBI-a. Zbog visoke kliničke sumnje učinjen je PET-CT s kolinom kojim se potvrdila dijagnoza PHPT. Od ostale dijagnostičke obrade ističe se UZV abdomena kojim je potvrđena nefrolitijaza. Iako bez simptoma, bolesnica je podvrgnuta desnostranoj paratireoidektomiji zbog mlađe životne dobi i nefrolitijaze. Zaključak: Ovaj slučaj naglašava kompleksnost dijagnostike PHPT te važnost individualiziranog pristupa u upravljanju asimptomatskim slučajevima, ističući potencijalne prednosti pravovremene intervencije u očuvanju dugoročnog zdravlja.

Levotiroksin apsorpcioni test kod pacijentkinje sa perzistentno povišenim vrednostima tireostimulišućeg hormona

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Hipotireoza uzrokovana bolešću štitaste žlezde predstavlja smanjenu sekreciju tiroksina (T4) i trijodtironina (T3) što dovodi do kompezatorno povećanog lučenja tireostimulišućeg hormona (TSH). U većini pacijenata ovakvo stanje zahteva doživotnu terapiju, a cilj terapije je postizanje eutiroidnog stanja primenom sintetskog tiroksina (T4, levotiroksina). Adekvatna supstitucija se procenjuje merenjem koncentracije serumskih tiroidnih hormona i TSH. Ponekad se mogu registrovati perzistentno visoke vrednosti TSH što može biti posledica loše apsorpcije ili neadekvatnog uzimanja terapije. Osnovna metoda razlikovanja pseudomalaporpcije od malapsorpcije je test apsorpcije levotiroksina - LAT. Pacijentkinja starosti 49 godina, lečena je levotiroksinom zbog hroničnog autoimunskog tiroiditisa. Na našu Kliniku je primljena zbog perzistetno visokih vrednosti TSH (50…106.8 mIU/L) i niskih vrednosti fT3 i fT4 uprkos povećavanoj dozi levotiroksina do 175 mcg. Žalila se na pospanost i malaksalost. U našoj laboratoriji, analizom tiroidnog hormonskog statusa, registrovane su više vrednosti TSH (80.16 mIU/L) i niže vrednosti fT4 (5.5 pmol/L) uz pozitivna tiroid-specifična autoantitela (TPOAt 281 IU/mL, TgAt veća od 4000 IU/L). Urađen je test apsorpcije levotiroksinom, peroralnom primenom tableta levotiroksina u dozi od 1000 mcg. U LAT testu dobijene su vrednosti TSH 69.63; 61.93; 56.85; 57.63; 60.7; 63.79; 35.27 mIU/L, fT4 6.4; 7.9; 12.5; 25.8; 20.5; 15.9; 13.3 pmol/L, T4 40.6; 46.1; 62.4; 94.7; 187.2; 146.6; 112.4 nmol/L, koji je ukazao na urednu aporpciju. Na osnovu rezultata zaključeno je da razlog poremećaja tiroidnog hormonskog statusa nije malapsorpcija. Test asporpcije levotiroksinom je koristan za procenu i potvrdu dijagnoze pseudomalaposrpcije. Adekvatno informisanje pacijenata o upotrebi leka, redovno uzimanje terapije su ključni za rešavanje ovakvog specifičnog problema.

Case Report of Parathyroid Adenoma in a Patient with Hashimoto's Thyroiditis

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Introduction: Primary hyperparathyroidism results from increased production of parathyroid hormone. The most common cause of primary hyperparathyroidism is single parathyroid adenoma in 80 to 85% of cases. Case report: The patient is a 50-year-old female. She visits the endocrinology outpatient department at our general hospital for the first time, presenting a medical history of Hashimoto's thyroiditis. She is currently undergoing regular treatment with Levothyroxine tablets, with consistent monitoring and appropriate substitution for routine check-ups. Her medical history includes complaints of fatigue, weakness, and depression. These symptoms began a few years ago, despite prior psychiatric evaluation and antidepressant therapy, her condition did not improve. During an ultrasound examination of the thyroid gland, hypoechoic nodule was seen under the left thyroid lobe with dimensions 5.1 x 8.7 x 7.4 mm, on doppler ultrasound with diffuse blood flow, suspicious for parathyroid adenoma. Laboratory analyses displayed elevated parathyroid hormone and calcium levels: Parathyroid hormone: 10.65 pmol/L (reference range: 1.26-5.3), Calcium: 2.78 mmol/l, Ionized calcium: 1.46 mmol/l, Phosphorus: 0.8 mmol/l, TSH: 2.65 IU/ML, fT4: 17.2 pmol/l. Other laboratory analyses in reference values. The presence of an adenoma was confirmed through radionuclide scanning. Densitometry in addition to osteopenia. On an ultrasound examination of the abdomen, stones were seen in both kidneys. The patient was advised to increase fluid intake, and a retesting laboratory value of calcium was 2.58. Subsequently, the patient was referred for surgery. Conclusion: In the presence of nonspecific symptoms, it is essential to consider the possibility of hyperparathyroidism and to conduct appropriate laboratory screening.

DYSTHYROID ORBITOPATHY FOLLOWING ESTABLISHMENT OF EUTHYREOSIS

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Dysthyroid orbitopathy (also known as Graves ophtalmopathy or Graves orbitopathy) is an autoimmune disease of the orbit and retroorbital tissue that occurs in patients with Graves disease. Thyroid stimulating hormone receptors (TSHR) are, apart from the thyroid gland, present in adipocytes and fibroblasts. Anti-TSHR antibodies play an important role in the pathogenesis of dysthyroid orbitopathy. Activation of orbital fibroblast and TSHRs on adipocytes leads to fibroblast proliferation, adipogenesis, inflammation and accumulation of hydrophilic glycosaminoglycans (GAG), which ultimately increases extraocular muscle and orbital connective and adipose tissue. Around 25% of patients present with clinical features of Graves orbitopathy, with the most common ones being proptosis (exophthalmos), conjunctival inflammation, and periorbital edema. An ophthalmologic examination is essential for classifying disease severity and activity. If there are signs of moderate to severe disease, imaging of the orbit by computed tomography (CT) or magnetic resonance imaging (MRI) is necessary to evaluate the risk of optic nerve compression. Treatment depends on disease severity and activity, requiring a multidisciplinary approach.
This case report describes a 47-year-old female patient referred to the endocrinologist by her general practitioner due to suspected thyroid disease. The patient initially presented with palpitations, insomnia, recurrent wheals, and occasional diarrhea. The physical exam was without notable pathology. The results of the laboratory workup showed a TSH concentration < 0,01 mIU/L, fT4 47,8 pmol/L, fT3 20,8 pmol/L. Ultrasound imaging showed a mildly enlarged thyroid gland with increased color doppler perfusion. The patient was referred to Technetium-99m pertechnetate scintigraphy, which demonstrated an increased accumulation of the radiopharmacologic agent. The concentration of anti-TSHR antibodies was 48,3 IU/L. Following insight into the aforementioned results, the patient was prescribed thiamazol, propranolol and selenium. Two months following the first endocrinologic examination, the concentrations of peripheral thyroid hormones and thyrotropin were within reference intervals. However, the patient presented with signs of left-sided dysthyroid orbitopathy. She was referred to an ophtalmologic examination and further imaging workup, with the cerebral and orbital MRI results implicating dysthyroid orbitopathy. The patient was started on parenteral corticosteroid pulse therapy, which was administered to her at the Clinic for ocular diseases. Due to further disease activity progression of dysthyroid orbitopathy, total thyroidectomy was indicated, with iodine therapy deemed nonviable due to risk of ocular disease worsening. Despite achieving euthyreosis rather quickly, one should keep in mind that patients may develop dysthyroid orbitopathy up to several months following the achievement of a satisfactory hormonal status, although the disease itself is most often seen in tandem with hyperthyroidism (around 40% of cases).

Keywords: TSH receptor, dysthyroid orbitopathy, total thyroidectomy , anti-TSH receptor antibodies

Medullary Thyroid Carcinoma-Case Report

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Introduction: Medullary thyroid carcinoma accounts for 5-10% of all thyroid carcinomas and based of RET mutation analysis occurs in two forms: sporadic (85%) and familial (25%). Medullary thyroid carcinoma is aggressive, with rapid propagation in the surrounding lymph nodes and tissues. The prognosis is good, if the tumor is localized only in the thyroid gland at the time of diagnosis. Case report: A 50-year-old female came to our clinic for an examination due to facial redness, diarrhea and weight loss. The patient was on therapy with thiamazole 20 mg per day for thyrotoxicosis, diagnosed in another health institution 6 months ago. From laboratory finding, there was high levels of calcitonin-119.3 pg/ml. The ultrasound of thyroid gland was fine, except the finding in right lobe of inhomogeneous nodule measuring 8.7x5.9x7.8 mm with peripheral vascularization. We performed fine needle aspiration biopsy of the node in the right lobe. The cytological finding was benign hurtle cell adenoma in which the hurtle cells show atypia.The patient was sent for a right-sided lobectomy and the pathohistological finding was medullary carcinoma of the thyroid gland. The scan of the thyroid gland, CT scan of the neck, X-ray of the lungs were without any distal metastases of the disease. However, due to the nature of the tumor, the patient was sent for total thyroidectomy. Postoperative calcitonin and thyroglobulin levels were negative. Discussion: Calcitonin is an important serum biomarker for the diagnosis of medullary thyroid carcinoma as well as for prognosis and survival after surgery. Most often, patients come for an examination because of a lump in the neck area, but the symptoms caused by the systemic effects of calcitonin (flushing/diarrhea) should not be ignore, because it can lead to an early diagnosis of the disease. Conclusion: Routine analysis of serum calcitonin can help us for early diagnosis of medullary cancer when it is smaller than 1 cm, quick and adequate treatment that will ensure a good prognosis and cure of the disease.

Paradigma u menadžmentu hiperparatireoidizma

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Uvod: PHPT je važan uzrok hiperkalcijemije,najčešće uzrokaovane adenomom paratireoidne žlijezde.Klinička slika je heterogena i u razvijenim zdravstvenim sistemima hiperperkalcijemija može biti jedini slučajno identifikovan nalaz,a na drugim mjestima pacijenti imaju ćesto posljedice hiperkalcijemije poput kamenja u bubrezima,osteoporozu,psihičke poremećaje i anemiju.Liječenje je obično hirurško a prethode mu moderne tehnike snimanja koje hirurzima pomažu da lokalizuju adenom i intraoperativno ili kao u našem slučaju preoperativno uzimanje PTH,čime se potvrđuje izlječenje tijekom zahvata.Ciljevi: naš pacijent,star 64 godine bio je potpuno zdrav,bez hronične terapije osim infekcije Covid 19 prije hospitalizacije.Prvi puta je hospitaliziran zbog stanja šoka i simptoma i znakova teške hiperkalcijemije(na prijemu Ca u serumu >5 mmol/l; P: 0,5 mmol/l; PTH >1300 pg/ml) u EKG-u skraćen QT interval,širok T val, i koji je dva puta dijaliziran i propisani bifosfonati sa zadovoljavajućim kliničkim odgovorom.Evaluacijom slikovnim metodama (UZ i scntigrafija PTG-a,CT vrata)otkriven je nodus donje PTŽ,a čvor u gornje 2/3 lijevog riježnja je shvaćen kao tireoidni čvor.PHD ex tempore: Hyperplasio gll.parathyreoideae.Postoperativno je perzistirala hiperkalcijemija i povećan PTH (Ca :3,43 mmol/l , P: 0,7 mmol/l, PTH: 1176 pg/ml),a u sledećoj hospitalizaciji na ponovljenoj scintigrafiji opisani čvor zauzima gotovo cijeli lijevi riježanj štitaste žlijezde može odgovarati povećanom PTG.Urađena punkcija navedenog lijevog tireoidnog čvora čime je dobijen PTH u punktatu od 5000 pg/ml.Nakon operacije uočava se normalizacija serumske vrijednosti kalcija sa padom PTH za više od 50 % što je marker uspješnosti operativnog liječenja,a nalaz PHD govori u prilog adenoma pomenutog čvora. Zaključak: Citološka punkcija sa određivanjem PTH u sumnjivim čvorovima je zlatni standard u dijagnozi PHPT.

Ključne riječi: hiperparatireoza,kalcij,PTH,štitna žlijezda,čvor

Hyperfunctioning Thyroid Nodule and Thyroid Papillary Carcinoma

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Thyroid nodules are very common in everyday clinical practice. The majority of thyroid nodules are benign, while 10-15 % are estimated to be malignant. On radionuclide scans, malignant thyroid nodules nearly always appear as “cold” and are biochemically euthyroid. In this context, hyperfunctioning “hot” thyroid nodules are considered to be benign. Consequently, thyroid targeted guidelines recommend avoiding Fine Needle Aspiration Biopsy. However, rarely, hyperfunctioning thyroid nodules can harbor thyroid carcinoma, primarily papillary thyroid carcinoma. The exact prevalence is unknown, varying between 1-8%. Here we present a case of a 31-year-old female patient who was previously diagnosed with subclinical hyperthyroidism and referred to our clinic for further evaluation and management. Biochemical analysis revealed an almost undetectable TSH value and a normal value of fT4. Thyroid ultrasonography revealed a hypoechoic, solid nodule with irregular margins in the left thyroid lobe. Subsequent 99mTc radionuclide scintigraphy revealed a hyperfunctioning “hot” nodule in the lower portion of the left thyroid lobe with suppression of the extranodal thyroid parenchyma. The patient was treated surgically with left hemithyroidectomy. However, the histopathological results were consistent for papillary thyroid carcinoma. Totally thyroidectomy with left cervical lymph node dissection was then performed. Histopathological analysis after total thyroidectomy is currently undergoing and the patient is considered for Radioactive Iodine (RAI) adjuvant treatment. Although, hyperfunctioning thyroid nodules are most frequently benign, a papillary thyroid carcinoma cannot be always readily excluded. Physicians should maintain a sense of watchfulness and suspicious features of malignancy on a thyroid ultrasound should not be dismissed in this setting.

Gonadal diseases & PCOS

Ovarian Leydig Cell Tumor: Cause of Virilization in a Postmenopausal Woman

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Background: VOTs are a very rare ovarian tumor. They present <1% of all ovarian tumors and are rare cause of hyperandrogenism, less than 0.2% of cases described. Patients typically present with amenorrhea, except in menopausal women and rapidly worsening signs of virilization with or without mass effect. Leydig cell tumors are very rare type of VOTs -only 0.1% of ovarian neoplasms, but about 75% of cases are associated with androgen secretion, unilateral in 95% of cases with a higher frequency in postmenopausal women.
Case Report: 65-year-old menopausal woman was referred to our Endocrinology Clinic in 2021 because of progressive signs of virilization: 7-year history of hirsutism -mFG score of 27 at first consultation, with androgen alopecia and deepening of voice. The patient had very high levels of serum testosterone, normal level of dehydroepiandrosterone sulfate and suppressed levels of FSH, LH. Starting imaging technics: transvaginal ultrasound revealed- multiple small submucous myoma of the uterus, atrophic ovaria but without ovarian lesions and CT of abdomen and pelvis with contrast -revealed adenoma of the right suprarenal gland (19x17mm). In June 2021 a right suprarenalectomy was done, since this was the only finding. The HP of the tumor revealed suprarenal cortical adenoma and the levels of testosterone remained high, despite of removal of the adenoma. Given the previous radiological findings were equivocal, since ovarian catheterization for localization of androgen excess is unavailable in our country, 18F-fluorodeoxyglucose PET (18F-FDG-PET) was performed, which revealed an increased uptake in the right ovary topography (SUV max =8.8, D~26мм), suggesting this could be the source of excessive androgen production. Since the patient is menopausal a bilateral oophorectomy was done. Histological examination revealed a non-hilar Leydig cell tumor. After the surgery, the patient had stabilization of clinical parameters and her hormonal results totally normalized.
Conclusions: Leydig cell tumors are rare, and even when they are small, they can cause symptoms related to androgen excess. As a result, diagnosing them often is challenging. Surgery is the mainstay for the treatment of androgen-secreting tumors, and when successfully performed, usually leads to permanent cure. Although malignancy is always a concern, most VOTs show a benign behavior and -ovarian disease at presentation is uncommon.

Kompleksna pacijentkinja sa HAIR-AN sindromom i poremećajem kvaliteta života

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Uvod: HAIR-AN sindrom (hiperandrogenizam (HA), insulinska rezistencija (IR), Acanthosis nigricans (AN)) predstavlja specifičnu formu sindroma policističnih ovarijuma (PCOS). Učestalost javljanja je oko 5% svih žena sa hiperandrogenizmom.

Prikaz slučaja: Radi se o pacijentkinji koja od 18. godine života ima oligomenoreju i pojačanu maljavost na telu. U 27. godini života su dijagnostikovani hipertenzija i tip 2 dijabetes melitus. U 29. godini života je sprovedena dalja evaluacija na našem odeljenju. Pacijentkinja je bila gojazna (BMI 30.4 kg/m2), sa kliničkim znacima virilizacije (mFG skor oko 36, klitoromegalija) i laboratorijskom potvrdom hiperandrogenemije (testosteron 4.9 nmol/L, SHBG 17.4 nmol/L, FAI 28%, 17-OHP 8.0 nmol/L, androstenedion 3.7 ng/mL), progesteron je bio anovulatoran. U testu sa Synachtenom je postojao skok 17-OHP sa 4.4 na 7.9 nmol/L uz adekvatne vrednosti kortizola, bez odgovora ostalih androgena. Genetskim ispitivanjem je potvrđen normalan ženski kariotip i isključeno je postojanje KAH. Radiološki su opisani policistični izmenjeni ovarijumi, dok su nadbubrežne žlezde uredne prezentacije. Na osnovu celokupne kliničke slike je postavljena dijagnoza HAIR-AN sindroma. Najpre je započeto lečenje kombinovanom oralnom kontraceptivnom terapijom (ciproteron acetat/etinil-estradiol) na kojoj su uspotavljeni regularni MC, ali nije došlo do željene redukcije maljavosti. Potom uveden finasterid, što je praćeno ponovnim izostankom MC, zbog čega je terapija obustavljena. Istovremeno je primenjivana različita terapija u cilju bolje kontrole glikoregulacije, a najbolji efekat je postignut kombinovanom primenom semaglutida, bazalnog insulina i metfromina uz postizanje HbA1c 6.8%. Tokom praćenja su uspostavljeni regularni MC.

Zaključak: Ovaj slučaj opisuje ekstremni fenotip HAIR-AN sindroma i pruža pregled kliničkih karakteristika, manifestacija, dijagnoze i lečenja.

Adrenal gland diseases

Case Report: Rapidly growing adrenal gland tumor in a female patient with a history of colon cancer.

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The adrenal mass usually was discovered by ultrasound, and confirmed by radiologic examination such as computed tomography (CT) and magnetic resonance imaging. Physicians ask two questions: Is the change malignant and is it functional? Thus, adrenal masses include both benign and malignant pathologies, including adenoma, myelolipoma, cysts, hemorrhage, adrenocortical carcinoma (ACC), pheochromocytoma, metastasis, etc. The incidence of solitary adrenal metastasis from colorectal cancer (CRC) was reported 3.1 % to 14.4 %. In a 46-year-old woman with a history of colon cancer, during radiographic reviews, a right adrenal mass was discovered on CT scan, measuring 4.6 cm. Three months later, the size of the adrenal mass had increased up to 7 cm, measured by ultrasound. We performed morphological and functional tests, and a mass with a diameter of 12 cm with a necrotic field was confirmed by control CT scan. The testing showed a non-suppressible cortisol level (113 nmol/L) in the overnight suppression test, indicating autonomous glucocorticoid production without specific signs and symptoms of Cushing's syndrome, with high testosterone (4,5 nmol/) and DHEAS (16.50 µmol/) levels. Chromogranin A tested positive (118 ng/mL), and other tumor markers were negative. Following the surgery, specifically an adrenalectomy, the histopathological diagnosis confirmed ACC. Metastasis as the possible cause of the adrenal mass should always be considered, such as in the case of our patient, because the adrenal glands are frequent localisation of the metastases. We cannot rule out the possibility of primary carcinoma of the adrenals, and ACC was confirmed in this case report.

ONKOCITOM NADBUBREŽNE ŽLIJEZDE - PRIKAZ SLUČAJA

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Onkocitom, ili tumor onkocitnih stanica, je dobroćudni solidni tumor, obično lokaliziran u bubrezima, štitnjači ili žlijezdama slinovnicama. Rijetko se onkocitom može pronaći i na drugim mjestima, a posebice je rijedak onkocitom nadbubrežne žlijezde (NŽ), o kojem je do danas u literaturi opisano tek oko 200 slučajeva. Kada se otkriju, takvi su tumori obično nefunkcionalni i većinom benigni. Vrlo je teško dijagnozu onkocitoma NŽ postaviti na temelju radioloških karakteristika, jer tvorba obično ne pokazuje specifične značajke koje bi omogućile preoperativnu dijagnozu. S obzirom na povezanost ovih lezija s hipersekrecijom hormona i sumnju na njihovu malignost, terapija izbora je adrenalektomija.

U ovom prikazu slučaja opisujemo 23-godišnju pacijenticu kojoj je na sistematskom pregledu dijagnosticirana tvorba na lijevoj NŽ. Pacijentica je osim neredovitih menstrualnih ciklusa bila asimptomatska, obradom bez znakova hiperfunkcije NŽ. Magnetskom rezonancom opisana je tvorba dimenzija 25 x 22 mm koja se rubno imbibira kontrastom te je postavljena sumnja na adenom lijeve NŽ, no daljnjim ispitivanjima ipak je utvrđeno da se radi o solidnom tumoru. Iako je zbog inhomogene tvorbe pacijentici odmah preporučeno operativno liječenje, tada nije pristala na zahvat. Tijekom naredne tri godine pacijentica je praćena. Na kontroli u prosincu 2023. laboratorijski nalazi ukazali su na hiperandrogenemiju, a u međuvremenu su u potpunosti izostali menstrualni ciklusi. Na učinjenom CT-u otkrivena je ekspanzivna tvorba na lijevoj NŽ, dimenzija 55 x 35 x 50 mm, s pridruženom manjom lezijom na jetri od 4 mm. Učinjen je i MR koji je prema kojem opisana tvorba morfološki odgovara feokromocitomu. Pacijentica je čitavo vrijeme bila normotenzivna, bez znakova hiperkortizolizma i hiperandrogenemije. Zbog veličine tumora, u svibnju 2023. izvedena je laparoskopska lijevostrana adrenalektomija, a patohistološki je opisan onkocitni tumor kore NŽ. Postoperativno su vrijednosti androgena bile uredne te se normalizirao menstruacijski ciklus, što ukazuje na uspješno liječenje.

Subclinical Cushing syndrome

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Subclinical Cushing syndrome Case report: Case report of a 58-year-old female patient. who appears for an endocrinologist examination after 10 years. In 2012, the patient underwent a left adrenalectomy due to a tumorous change in the left adrenal gland (suspected meta change due to the detection of extremely elevated values of Ca 19-9 - 6410). During the surgical procedure performed by the urologist, abdominal exploration and partial resection of the stomach - Bilroth I . Now she complains of pain in the left lumbar area and insomnia. A tumor mass with a diameter of 2.8x4cm is verified on a CT scan of the adrenal gland. Elevated serum cortisol values are detected in the hormonal status. An MRI of the pituitary gland is performed, which does not reveal any pathological changes.

Due to the re-detected high values of Ca 19-9, a proximal and distal endoscopy was performed at the Gastroenterology Clinic, which did not reveal any pathological changes. On the control CT of the adrenal gland, the dimensions of the adenoma of the right adrenal gland are 58x38x28mm, after which the patient receives a recommendation for surgery from the urologist. Before the op. procedure, the patient is hospitalized at the Clinic for Endocrinology, where a long and short dexamethasone test is performed, but there was no suppression of ACTH and cortisol secretion.

Values of other hormones were in the reference range and the patient underwent a right adrenalectomy.

PRIKAZ SLUČAJA – PRIMARNI HIPERALDOSTERONIZAM

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2019. godine, tada 42. godišnji pacijent, javlja se u nefrološku ambulantu radi neregulirane arterijske hipertenzije koja je poznata unatrag deset godina. Unatoč antihipertenzivnoj terapiji prate se nezadovoljavajuće vrijednosti krvnog tlaka, osobito povišene dijastoličke vrijednosti uz granično sniženi kalij (K 3,8 – 3,6 mmol/L) u serumu.

Radi sumnje na primarni hiperaldosteronizam i povišenog omjera renin/aldosteron (>30) upućen je u endokrinološku ambulantu. Učinjenim testom opterećenja fiziološkom otopinom izostala je supresija aldosterona (aldosteron 886 pmol/L) dok su ostali nalazi pristigli uredni. Na MSCT-u abdomena po protokolu za nadbubrežne žlijezde opiše se nodozno uvećanje lijeve nadbubrežne žlijezde (20x15x16 mm) koje se imbibira kontrastom u prilog adenomu.

Pacijent je upućen u KBC Zagreb – Zavod za Endokrinologiju te je učinjenom kateterizacijom nadbubrežnih vena dokazana unilateralna bolest uzrokovana adenomom lijeve nadbubrežne žlijezde. Potom je sprovedena i lijevostrana adrenalektomija, a nakon završne reevaluacije prati se remisija bolesti.

Bleeding in adrenal gland and pheochromocytoma

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Introduction: Pheochromocytoma is a rare neuroendocrine tumor that arises from chromaffin tissue in the medulla of the adrenal gland or extra-adrenal paraganglia,characterized by excessive secretion of catecholamines. Case report: The 69-year old man was admitted due to a bleeding tumor of the right adrenal gland and retroperitoneal hematoma most likely caused by the use of DOAC (rivaroxaban). Comorbidities: T2DM,atrial fibrillation,coronary artery stenosis,hypertension. The patient on admission is pale,tachycardic,hypotensive with pain in the right hemiabdomen. On CT scan right subhepatic and in the right prerenal space, retroperitoneal hematoma with a diameter of 95x97mm with different bleeding times. In the right adrenal gland,an oval formation of about 60 mm is distinguished, from which active venous extravasation is distinguished. With previous adequate preparation,catecholamines and metanephrines that indicated pheochromocytoma,glucocorticoid and mineralocorticoid excess was excluded. Cardiovascular evaluation diagnosed a significant narrowing of the right ACI up to 75%. The multidisciplinary team agreed that a right adrenalectomy should be performed first.Preoperatively, the patient was treated with phenoxybenzamine.After adequate preoperative preparation,the patient was operated.PH pheochromocytoma adrenal paraganglioma. In the further postoperative course,after stabilization of the general condition,an endovascular procedure of the right carotid artery was performed and a stent was placed. Discussion:The most common neoplasm resulting in spontaneous adrenal hemorrhage is pheochromocytoma, accounting for nearly 50% of cases. Rupture of an adrenal pheochromocytoma is extremely rare and can be lethal, with a mortality rate of approximately 32%. Conclusion: We present a successfully completed challenging case of pheochromocytoma in a patient who had numerous severe cardiovascular comorbidities.

Poliglandularni autoimuni sindrom tip 2 komplikovan leptospirozom

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Poliglandularni autoimuni sindrom tip 2 (Šmitov sindrom) je najčešći oblik autoimunog poliglandularnog sindroma. Šmitov sindrom se definiše prisustvom 2 ili više endokrinopatije i najčešće uključuje adrenalnu insuficijenciju, Grejvsovu bolest ili autoimuni hipotireoidizam i/ili DM tip 1, kao i druge autoimune bolesti (vitiligo, celijakiju, pernicioznu anemiju, mijasteniju gravis).

Prikaz slučaja: Pacijent starosti 31 godine lečen na Klinici za nefrologiju zbog akutne bubrežne insuficijencije preveden je na Kliniku za endokrinologiju zbog teške hipotireoze i suspektnog hipokorticizma. Anamnestički pacijent navodi slabost u mišićima donjih ekstremiteta, zamaranje, usporenost i tamniju prebojenost kože koji traju 6 meseci unazad. U fizikalnom pregledu kod pacijenta je prisutna tamnija prebojenost kože i sluznica. U laboratorijskim analizama hiponatermija uz hiperkalemiju, povišene vrednosti transaminaza, kreatin kinaze i kreatinina, zbog čega je testiran na HANTA virus i Leptospiru. Tokom hospitalizacije na Klinici za nefrologiju utvrđeno postojanje teške hipotireoze (TSH 299, fT4 0.5) i hipokorticizma (kortizol 104.5) kada je započeta supstituciona terapija – parenteralna kortikosterodina terapija i levotiroksin. Radi nastavka lečenja pacijent preveden na našu Kliniku. Po pristizanju pozitivnih IgM antitela na Leptospiru po indikaciji infektologa uvedena je i antibiotska terapija. Kod pacijenta prisutna anti TPO i anti TG antitela, kao i pozitivna anti adrenalna antitela. Ostale imunološke analize su pristigle uredne, kao i uredan nalaz CT abdomena. Na primenjenu terapiju kod pacijenta dolazi do subjektivnog poboljšanja, kao i normalizacije azotnih materija, elektrolita, transaminaza i kreatin kinaze.

Zaključak: Šmitov sindrom se može pogrešno dijagnostikovati zbog ranih simptoma sličnih spektru drugih bolesti, zbog čega je bitno da se na njega misli i pravovremeno postavi dijagnoza.

Demografske, kliničke i laboratorijske karakteristike diabetes mellitusa tip 1 u vrijeme postavljanja dijagnoze

Azra Feukić

Sažetak:
U retrospektivnoj studiji provedenoj na Odjeljenju endokrinologije, bolesti metabolizma i medicinske genetike JZU UKC Tuzla, za period od 1.1.2015. do 31.12.2021. godine, ispitane su demografske, kliničke i laboratorijske karakteristike 109 pacijenata, oba pola, uzrasta 0-14 godina, koji su liječeni kao novootkriveni pacijenti sa dijabetesom melitusom tip 1 (T1DM).

Rezultati:
Incidenca T1DM na Tuzlanskom kantonu u navedenom periodu iznosila je 19,8 na 100.000 djece na godinu. U odnosu na dob pacijenti su podjeljeni u tri dobne skupine, gdje je najviše pripadalo dobnoj skupini od 10 do 14 godina 42 (38,5%), potom od 5 do 9,9 godina 41 (37,5%), a najmanje u dobnoj skupini od 0 do 4,9 godine 26 (24%) pacijenata. Iz gradske sredine je poticalo 55 ispitanika (50,45%), ruralne 54 (49,55%). Najčešći simptomi koji su doveli do postavljanja dijagnoze bili su poliurija (94,4%), polidipsija (94,4%), nikturija (88,9%) i gubitak na tjelesnoj masi (76,13%). Prosječna dob otkrivanja bolesti bila je 8 godina. Prosječno vrijeme trajanja simptoma prije otkrivanja bolesti bilo je 20 dana. Učestalost dijabetične ketoacidoze (DKA) iznosila je 42%. Učestalost DKA kod dječaka je iznosila 37%, kod djevojčica 44%. Blagi oblik DKA je imalo 27 (62%), umjerenu 5 (11%) a tešku DKA je imalo 12 (27%) pacijenata. Najveći broj djece u stanju DKA se otkrije u 10. godini života. Prisutnost pozitivnih autoantitijela na gušteraču zabilježena je kod 88,8% novootkrivenih pacijenata. Najčešće su bila pozitivna GAD antitijela (43,07%), IA2 (26,41%) te AIA (28,07%). Najčešća komorbidna autoimuna stanja sa T1DM su bila celijačna bolest (7,3%) i autoimuna bolest štitnjače (5,6%). Deficit vitamina D na otkrivanju T1DM registrovan je u 67,6% pacijenata.

Zaključak:
Prosječna incidenca T1DM na Tuzlanskom kantonu je udvostručena u odnosu na petnaestogodišnji period te utrostručena u odnosu na dvadesetpetogodišnji period. Udio bolesnika koji se otkrivaju u stanju DKA još uvijek je visok i iznosi 42%. Potrebne su dalje mjere za bolju prosvjećenost roditelja i zdravstvenog osoblja o postojanju T1DM, posebno u cilju ranog prepoznavanja simptoma bolesti.

Ključne riječi: diabetes mellitus tip 1; demografske; kliničke; laboratorijske karakteristike

Metabolic Syndrome and Obstructive Sleep Apnea

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Obstructive sleep apnea (OSA) is a common sleep disorder characterized by apnea that leads to intermittent hypoxia and sleep disturbances. OSA is most often found in obese, middle-aged men, and as the prevalence of obesity increases, so does the prevalence of OSA. OSA is most often presented by snoring, excessive daytime sleepiness, fatigue and headache. The relationship between OSA and the metabolic syndrome is hypothesized to be bidirectional. It has been shown that chronic intermittent hypoxia and inadequate sleep in OSA, regardless of body mass, are associated with the development of insulin resistance as well as pancreatic beta cell dysfunction, which leads to the development of type 2 diabetes. The above is also associated with other components of the metabolic syndrome: arterial hypertension and dyslipidemia. Also, the severity of OSA is related to the degree of insulin resistance. It is assumed that the above is caused by increased sympathetic activity, oxidative stress, low-grade systemic inflammation and increased expression of SREBP (sterol regulatory element binding protein) and decreased lipase activity. The above mentioned causes reduced insulin sensitivity, reduced insulin secretion and increased synthesis of LDL, VLDL cholesterol and triglycerides with a decrease in HDL cholesterol concentration. On the other hand, obesity is known to worsen OSA, and recently the role of other components of the metabolic syndrome in OSA has been investigated. Hyperglycemia and glucovariability, insulin and leptin resistance may play a role in worsening OSA primarily by acting on the carotid bodies as the main peripheral chemoreceptor for blood gases. However, there is still much uncertainty about the bidirectional relationship between OSA and the metabolic syndrome, and further research is needed to clarify this relationship.

Key words: obstructive sleep apnea, metabolic syndrome, insulin resistance, type 2 diabetes

Late diagnosis of latent autoimmune diabetes in adults – a case report

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Latent autoimmune diabetes in adults (LADA) is a type of autoimmune diabetes that begins in adulthood. It is characterized by a less intensive autoimmune process and a broad clinical phenotype compared to classical type 1 diabetes mellitus , sharing features with both T2DM and T1DM. We report a case of a 68-year-old woman previously diagnosed with type 2 diabetes and started on oral antidiabetic regimen with Metformin and Vildagliptin. Despite adherence to oral therapy the patient had poorly regulated Hba1C. Her medical history was notable for primary hypothyroidism. There was no known family history of diabetes. During physical examination regulary build with BMI of 21.7. Her glycated hemoglobin was 9.5%. Laboratory workup revealed random blood glucose level of 15mmol/l, normal basal C-peptide (0.55nmol/l), normal renal function and glicosuria. Islet cell antibodies, zinc transporter 8 antibodies and glutamic acid decarboxylase antibodies were positive, and the LADA diagnosis was confirmed. A therapeutic regimen with glargine basal insulin once daily and insulin aspart before meals was initiated. At follow-up three and nine months later, the patient maintained excellent regulation, and his hemoglobin A1C had improved to 7.5% and 5.4%, respectively. This case highlights the importance of being aware of this condition, especially in patients previously diagnosed with type 2 diabetes who remain uncontrolled with diet and oral hypoglycemic agents. Thus, since the autoimmune process in LADA seems to be slower than in classical T1DM, there is a wider window for new therapeutic interventions that may slow down β-cell failure.

Type 2 diabetes duration is associated with enhanced inflammageing mediated by cytotoxic lymphocytes

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Chronic systemic low-grade inflammation is an underappreciated symptom of type 2 diabetes (T2D). The inflammatory cascade is believed to be a causative factor in developing several comorbidities associated with T2D, such as atherosclerosis, diabetic kidney disease, and fatty liver disease. However, the impact of T2D on the inflammatory state of the immune system is incompletely characterised. The aim of this study is to investigate whether T2D is associated with a pro-inflammatory profile within the anti-viral arm of the immune system. Blood collection and anthropometric measurements were performed in outpatients with type 2 diabetes (n=49), and age- and gender-matched control subjects (n=30). The phenotype, proliferation capacity and cytokine production by cytotoxic lymphocytes were analyzed using multiparametric flow cytometry. Mean glycated haemoglobin A1c level was 8.4±1.1% and 5.4±0.4% in the Diabetes and Control group, respectively. Significantly increased production of tumour necrosis factor by CD8 T cells and Granzyme B by NK cells and γδ T cells was observed in patients with diabetes in comparison to the control group. The hyperresponsiveness of cytotoxic blood lymphocytes did not correlate with glycaemia or body mass index but was associated with older age and longer diabetes duration. In summary, cytotoxic immune cells change their functional profile in the context of diabetes and may, therefore, contribute to the development and worsening of inflammation-driven diabetic complications. Further research is necessary to explore the potential benefits of diabetes medications in reverting hyperresponsiveness of the antiviral arm of the immune system in individuals with type 2 diabetes.

Management strategies for post-transplant diabetes mellitus after heart transplantation

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Post-transplant diabetes mellitus (PTDM) is a well-recognized complication of heart transplantation and is associated with increased rates of serious infection, graft-related complications such as graft rejection and reduced long-term survival compared to nondiabetic recipients. The diabetogenic effects of the immunosuppressive agents have contributed to increased rates of PTDM. We present a case of a 53-year-old male patient received a heart transplant in October 2023 because of heart failure. His medical history included heart failure since 2016 and prediabetes since 2014. After transplantation the patient was treated with heart transplant immunosuppressive regimen. In addition to these, he also received maintenance therapy with prednisolone. Following solid-organ transplantation, there is a high incidence of "stress hyperglycemia" in the immediate post-transplant period. His DM was well controlled with aggressive management of hyperglycemia for the duration of hospitalization, with a continuous infusion insulin regimen with short acting insulin, to maintain BG below 11 mmol/L during the intensive care unit stay. Before transplantation, prediabetes was managed with Metformin only and for heart failure Empagliflozin 10mg . After transplantation insulin-glargine was initially started. In addition, during the first month after transplantation, he received short-acting insulin. Four months after his transplantation and when prednisolone had been tapered to 5 mg daily, his current glucose-lowering treatment consists of Metformin, insulin glargine and SGLT 2 inhibitors (Empagliflozin 25mg). There is currently very little published clinical data to guide the clinician regarding the risks and benefits of individual agents in the post-transplant setting. In the immediate posttransplant period, insulin therapy is the only safe agent in the context of increased risk of lactic acidosis and single or multiorgan failure. The limited clinical experience with newer classes such as incretins and SGLT2 inhibitors suggests that they may have a favourable risk/benefit ratio.

HONEYMOON PERIOD IN TYPE 1 DIABETES

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Šećerna bolest tipa 1 kronična je bolest koja nastaje autoimuno posredovanom destrukcijom beta stanica gušterače što posljedično dovodi do inzulinopenije i hiperglikemije. U trenu postavljanja dijagnoze velik dio beta stanica više nije funkcionalan, no nakon 2-3 mjeseca 90% bolesnika ulazi u fazu parcijalne remisije kada su potrebe za inzulinom manje za 50%. Kod manje od 10% bolesnika dolazi do potpune remisije s urednim glikemijama, bez potrebe za uzimanjem inzulina. Ova faza šećerne bolesti tipa 1 naziva se medeni mjesec (engl. honeymoon) i može potrajati od nekoliko mjeseci do godina. Tjelovježba, suplementacija vitaminom D, imunološki i brojni drugi čimbenici utječu na trajanje ove faze.

Prikaz slučaja:
Bolesnik u dobi od 19 godina pregledan je putem hitne ambulante zbog anamneze o pojačanom žeđanju i gubitku osam kilograma unazad mjesec dana. Učinjenom obradom izmjerene su povišene vrijednosti glukoze u plazmi (17 mmol/L) i glikiranog hemoglobina (15,3%) te je uvedena intenzivirana inzulinska terapija. Daljnjom obradom verificirana su pozitivna GAD, ICA i IA-2 autoantitijela uz granične vrijednosti C peptida te je dijagnosticirana šećerna bolest tipa 1. Bolesniku je postavljen uređaj za kontinuirano mjerenje koncentracije glukoze u međustaničnoj tekućini (FGMS, engl. Flash glucose monitoring system). Prema izvješću FGMS uređaja šećerna bolest je za dva mjeseca zadovoljavajuće regulirana uz postupno smanjenje doza inzulina. Na posljednjoj kontroli, vrijeme u ciljnom rasponu (TIR, engl. time in range) bilo je 78% uz napomenu da bolesnik uopće nije aplicirao inzulin. Preporučeno je pridržavanje dijabetičke dijete, redovita tjelesna aktivnost, uzimanje nadomjesne terapije vitamina D uz redovito praćenje koncentracije glukoze u plazmi i ponovno uvođenja inzulina po izlasku iz faze medenog mjeseca.

Ključne riječi: šećerna bolest tipa 1, honeymoon, medeni mjesec, remisija

Izazovi u dijagnostici i liječenju porodične hiperkolesterolemije

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Prikaz slučaja: Predstavljamo slučaj bolesnice u dobi od 69 godina koja se prvi puta u endokrinološku ambulantnu KBC Osijek javlja radi dislipidemije. Riječ je o bolesnici koja od djetinjstva zna za dislipidemiju te joj je majka preminula u mlađoj životnoj dobi uslijed infarkta miokarda, a sestra također boluje od dislipidemije. Uvidom u raniju medicinsku dokumentaciju vidimo kako se liječi radi angine pectoris, kardiomiopatije te arterijske hipertenzije. U dobi od 41 godine, preboljela je akutni infarkt miokarda te je učinjen CABG. 2010.g. operirala je aortalnu valvulu te je 2016.g. operirana radi stenoze abdominalne aorte. Po dolasku u našu ambulantu prilaže vrijednosti kolesterola 15,8 te LDL-k 11,7 mmol/L uz redovnu primjenu atorvastatin tbl 1x80mg te ezetimib tbl 1x10mg. Učinjenom obradom verificira se stenoza obje ACI te ACE te je nakon toga razvila ICV. Obzirom na DCLNS koji upućuje na porodičnu hiperkolesterolemiju, započne se s liječenjem PCSK9 inhibitorom uz dosadašnju terapiju. Po uvođenju terapije prati se poboljšanje lipidnoga profila, no i dalje perzistira značajno povišena vrijednost LDL-k što upućuje na homozigotni oblike iste stoga je savjetovano liječenje LDL aferezom za koji se bolesnica ne odlučuje te probir svih bližih krvnih srodnika. Zaključak: Porodična hiperkolesterolemija znatno je češća bolest no što se ranije smatralo, s prevalencijom bolesti 1:250 osoba. Kako bi se smanjio rizik od razvitka opsežne aterosklerotske bolesti te preuranjenih kardiovaskularnih bolesti potrebna je rana dijagnoza bolesti kao i liječenja iste.

Miscellaneous & Novelties in endocrinology and diabetes

Unraveling the Impact of Endocrine Disruptors

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Endocrine disruptors (ED) are chemicals that may mimic, block, or interfere with the endocrine system, leading to adverse effects on hormonal regulation and physiological functions. Commonly encountered EDs include industrial chemicals, pesticides, plasticizers and other products present in the environment.

Phthalates, bisphenol A (BPA), polychlorinated biphenyls (PCBs), and organochlorine pesticides are among the well-studied EDs. Operating through complex mechanisms EDs can disrupt hormone synthesis, secretion, transport, receptor binding, and metabolic pathways, often at low doses. It has been suggested that ED exposure may contribute to the rising incidence of reproductive abnormalities, obesity, diabetes, and certain cancers.

Vulnerable populations such as fetuses, infants, and children are particularly susceptible due to their rapid development and sensitivity to hormonal changes. Furthermore, transgenerational effects expose the potential for EDs to impact future generations.

Addressing the challenges posed by EDs requires interdisciplinary research, regulatory policies, and public awareness campaigns. Long-term surveillance studies and global collaborations are needed to assess the full extent of EDs' impacts and implement effective strategies for prevention and intervention.
A better understanding of ED effects will call for regulatory measures and public health interventions aimed at minimizing exposure and mitigating potential adverse outcomes.

CASE REPORT IN A PATIENT WITH OSTEOGENESIS IMPERFECTA

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Background: Osteogenesis imperfecta is a genetic disease manifested by increased bone fragility, low bone mass and other manifestations of connective tissue. Case presentation: A 22-year-old female patient . Diagnosed with nanosomy at the age of 5, MRI scan confirmed the diagnosis of empty sella syndrome with ectopic neurohypophysis. Due to thyroxine deficiency, she was put on levothyroxine. The GnRH activity at the age of 13 was low, therefore puberty was induced with combined oral contraceptives (ethynyl estradiol/drospirenone). The first sign of OI (curvature of the legs) was noticed at the age of 12. She has blue sclerae, a triangular face. Several doses of growth hormone were given due to hypopituitarism.In the postpubertal period, the patient marks multiple fractures in the upper and lower extremities. Positive family history-cousin, nephews of cousin with osteogenesis imperfecta. The DEXA scan revealed low bone density, and the genetic testing confirmed the diagnosis of type I OI. The patient was started on treatment with Ibandronic acid and supplements containing calcium, vitamin K and vitamin D3. She responded adequately to the therapy and, at the age of 27, wanted to achieve pregnancy. The patient was started on GnRH replacement therapy and in-vitro fertilization was performed. She delivered a healthy female newborn via cesarean section on the 39th gestational week. Conclusions: OI is a diagnostic challenge and can often be masked by other conditions. Prompt evaluation of multiple fractures is essential for establishing the correct causative agent. Multidisciplinary approach is the cornerstone of patient management.

Glukagonoma sindrom (Glucagonoma syndrome)

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Uvod: Glukagonoma sindrom karakteriše prisustvo gukagon-produkujućeg neuroendokrinog tumora pankreasa, hiperglukagonemije i karakterističnih kožnih pomena pod nazivom nekrolitički migratorni eritem (NME).

Prikaz slučaja: Pacijentkinja se u svojoj 79. godini života javila lekaru zbog pojave crvenila i erozija na koži tela. Biopsijom promena na koži dijagnostikovan je acrodermatitis enteropathica i u terapiju je uvedena suplementacija preparatima cinka, bez postizanja povoljnog terapijskog efekta. U daljem toku je sprovedeno gastroenterološko ispitivanje zbog anemijskog sindroma, patološkog hepatograma i gubitka u telesnoj težini. Radiološki su verifikovane multiple fokalne promene u jetri karakteristika sekundarnih depozita, kao i dve fokalne promene u telu i repu pankreasa karakteristika neuroendokrinog tumora (NET). Po prijemu na naše odeljenje je pacijentkinja bila astenične konstitucije, blede kože sa slivenim eritematoznim plažama sa erozijama i ekskorijacijama na šakama, ekstenzornim stranama podlaktica, laktovima, ramenima, bočnim stranama trupa, sakralnoj regiji, gluteusima, perianalno, zadnjoj strani natkolenica i na potkolenicama. U laboratorijskim analizama su verifikovane normocitna anemija, hipoalbuminemija, hipokalijemija i hipofosfatemija. Vrednosti hromogranina A su bile nespecifično povišene. Nalaz Octreoscan-a je bio pozitivan u jetri i pankreasu. Biopsijom jetre je dokazano da se radi o metastazi umereno diferentovanog glukagon sekretujućeg NET-a (Ki-67 indeks 3%). Učinjene su distalna pankreatektomija sa ekscizijom tumora vrata pankreasa i atipična resekcija jetre, čime je potvrđena prethodno postavljena dijagnoza metastatskog glukagonoma sa većim proliferativnim indeksom nego inicijalno (9.5%). Postoperativno perzistiraju sekundarni depoziti u jetri. U terapiju je uveden dugodelujući analog somatostatina, čime je postignuto kliničko i laboratorijsko poboljšanje, uz višegodišnje održavanje morfološki i funkcionalno stabilne bolesti.

Zaključak: Prikazali smo pacijentkinju sa metastatskim glukagonomom i kliničkim manifestacijama glukagonoma sindroma, kao i primenjene dijagnostičke i terapijske modalitete.

Perzistentni hiperparatiroidizam – dijagnostičke i terapijske dileme

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Uvod: Perzistentni hiperparatiroidizam je stanje koje se karakteriše hiperkalcemijom nakon paratiroidektomije ili ponovnim javljanjem hiperkalcemije u prvih 6 meseci nakon operacije.

Prikaz slučaja: Pacijentkinja je operisana u 57. godini života kada su učinjeni levostrana nefrektomija, adrenalektomija i ekstirpacija tumora zbog onkocitnog karcinom kore nadbubrežne žlezde sa značajnim metastatskim potencijalom. Postoperativne vizualizacije su bile bez znakova rest/recidiva i diseminacije bolesti, međutim planirano adjuvatno lečenje mitotanom je odloženo zbog potvrde primarnog hiperparatiroidizma (PHPT) sa hiperkalcemijom >3mmol/L (PTH 120-160 ng/L), bubrežnom slabošću (CKD3), kalkulozom solitarnog bubrega i osteoporozom. S ozbirom da je preoperativna MIBI scintigrafija bila negativna učinjena je subtotalna paratiroidektomija, a patohistološki nalaz je potvrdio hiperplaziju četiri paratiroidne žlezde. Postoperativno perzistira PHPT sa hiperkalcemijom > 3mmol/L uprkos učestaloj primeni zolendronične kiseline zbog čega su u dopuni nalaza urađeni MIBI-SPECT/CT, ciljani MSCT vrata i grudnog koša i ponavljani UZ pregledi kojima nije vizualizovana ektopična PT žlezda. Marta 2023. godine je urađen 18F-Holinski PET/CT koji potvrđuje ektopičnu PT žlezdu u nivou prvog sternokostalnog spoja sa desne strane veličine 6mm. Pacijentkinja je operisana drugi put kada je učinjena VATS eksploracija medijastinuma i timektomija, ali PT žlezda nije pronađena. Konačno, godinu i po dana od inicijalne dijagnoze je uspešno operisana treći put kada je učinjena sternotomija i ekstirpacija ektopične PT žlezde i patohistološki je potvrđen adenom. Nakon treće operacije je lečena i parenteralnom supstitucijom kalcijuma zbog razvoja sindroma gladnih kostiju.

Zaključak: Ovaj slučaj naglašava izazove u dijagnostici i lečenju perzistentnog hiperparatiroidizma, ističući potrebu za pažljivim praćenjem, ponovljenim ispiftivanjima i multidisciplinarnim pristupom.

Tumorom indukovana osteomalacija udružena sa tercijarnim hiperparatiroidizmom – prikaz slučaja

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Tumorom indukovana osteomalacija je redak paraneoplastični sindrom gde obično benigni mezenhimalni tumor sekretuje u velikoj količini fibroblastni faktor rasta 23 (FGF-23) dovodeći do nespecifičnih simptoma u vidu bolova u kostima i malaksalosti. Patognomičan, a često previđen laboratorijski rezultat je hipofosfatemija. Ovaj prikaz slučaja bavi se pacijentom kod koga je dijagnoza tumorom indukovane osteomalacije postavljena pre oko deset godina na osnovu visokih vrednosti FGF-23 i pozitivnog nalaza Ocreoscan-a koji je ukazao na pojačanu fiksaciju radionuklida u donjem nivou leve potkolenice. Potom je pacijentu operisan mezenhimalni tumor potkolenice koji je i bio uzrok paraneoplastičnog sindroma, uz postoperativnu terapiju sa 1,25 OH vitaminom D u dozi od 1 mcg dnevno. Na kontrolama pacijent je bio bez recidiva oboljenja (znatni pad FGF-23, potpuna korekcija hipofosfatemije) i sa smanjenim intezitetom simptoma sve do ove godine kada pacijent ponovo počinje da oseća iste tegobe uz palpabilnu tumefakciju na mestu operacije. Radigrafijom potkolenice postavlja se sumnja na recidiv oboljenja, uz serumski fosfat i odnos maksimalne tubularne reapsorpcije fosfata u odnosu na glomerulsku filtraciju u rangu potvrde recidiva oboljenja. Međutim kod pacijenta se registruje i hiperkalcemija uz veoma visoke vrednosti paratiroidnog hormona. Scintigrafija paraštitastih žlezda potvrđuje hiperaktivnu paraštitastu žlezdu u kaudalnom polu desnog tireoidnog režnja. S obzirom da je su kod pacijenta godinama unazad registrovane blago povišene vrednosti parathormona uz normalne vrednosti kalcijuma, postavljena je dijagnoza tercijarnog hiperparatireoidizma. U planu je operativno lečenje hiperparatiroidizma, uz kontrolni Octreoscan radi dalje evaluacije i lečenja recidiva tumorom indukovane osteomalacije.

Intrapancreatic accessory spleen: a case report

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A 60-year-old male patient who suffered from type 2 diabetes, was diagnosed with a hypoechoic, homogeneous, well-defined mass in the tail of the pancreas, which measured 25 mm, while he had his routine sonography examination of the abdomen. The physical exam was unremarkable. Laboratory findings of serum amylase, lipase, carcinoembryonic antigen, and carbohydrate antigen 19-9 were within the reference range. He denied all symptoms of a functioning pancreatic neuroendocrine tumor. Our patient was further referred for computed tomography (CT). On CT lesion was highly suggestive of an intrapancreatic accessory spleen (IPAS). The diagnosis of IPAS was confirmed with magnetic resonance imaging. Owing to comorbidities, our patient refused further evaluation of the tumor or surgery. After 8 years from the diagnosis of IPAS, the patient was stable. In patients who are poor candidates for surgery, characteristic location and imaging features may be specific enough to diagnose IPAS with great certainty. Tumors such as IPAS were very rarely discovered before the era of modern radiology. Now it is more important to make a correct differential diagnosis from other potentially malignant mimickers, as IPAS are detected more frequently than before. Being aware of this condition would help correctly diagnose IPAS and thus prevent unnecessary surgery.

Keywords: accessory spleen, pancreas, tumor, computed tomography, magnetic resonance imaging

Recidiv insulinoma nakon hiruške resekcije

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Insulinom je neuroendokrini tumor pankreasa koji dovodi do hipoglikemija. Incidenca je 4/1000000 godišnje. 90% insulinoma je benigno, oko 5% se javlja u sklopu tipa 1 multiple endokrine neoplazije. Više od 99% se nalazi u pankreasnim ostrvcima i malog je prečnika. Dijagnoza se postavlja na osnovu hormonskih ispitivanja i radioloških procedura (neinvazivnih i invazivnih). Lečenje je hiruško. Rizik od recidiva insulinoma nakon hiruške resekcije je veći kod pacijenata sa MEN1. Pacijentkinja, 27 godina, hospitalizovana je drugi put na Klinici aprila 2021. godine zbog ponavljanih epizoda hipoglikemija. Prva hospitalizacija jula 2016. tokom koje je na osnovu MSCT abdomena i funkcionalnih testova postavljena dijagnoza organskog hiperinsulinemijskog hipoglikemijskog sindroma porekla insulinoma. Avgusta 2016. - enukleacija tumora pankreasa. PH : dobro diferentovani tumor("NET-G1"), ali zbog povišene proliferativne aktivnosti tumora - (pro) insulin-producing NET-G2. Genetska analiza za MEN1 je bila negativna. U novoj hospitalizaciji 72h test gladovanja je prekinut 3. dana pri vrednostima glikemije 1,4mmol/l uz visok I/G indeks 0,833. Patološki indeksi su mereni još nekoliko puta tokom testa. UZ abdomena, MR abdomena, endoskopska ultrasonografija pankreasa - uredni. PET/CT snimanje celog tela(18FDG): b.o. Semplovanjem hepatične vene nakon stimulacije Ca-glukonatom arterija pankreasa dobijeni su nalazi povisene sekrecije insulina i c-peptida iz a. gastroduodenalis i a. hepatica. Intraoperativno se inspekcijom i palpacijom ne verifikuje tumorska promena u glavi pankreasa. Intraoperativnim ultrazvukom verifikovana promena promera oko 8mm. PH nalaz: dobro diferentovani NET-G2 s produkcijom (pro)insulina. Kod pacijentkinje je hormonski potvrđen recidiv insulinoma. Sve dostupne radiološke metode su bile negativne osim semplovanja hepatične vene nakon stimulacije arterija pankreasa Ca-glukonatom. Nakon enukleacije insulinoma pacijentkinja je postupkom IVF ostvarila trudnoću.

Severe presentation of Type 1 diabetes and autoimmune polyglandular syndrome

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Abstract:
Background: Polyglandular autoimmune syndrome type 2 (PAS-II) is a rare condition characterized by organ-specific damage due to lymphocytic infiltration, often presenting as primary adrenal insufficiency (Addison's disease), autoimmune thyroid disease, and type 1 diabetes mellitus (T1DM).

Case presentation:
We report the case of a 22-year-old patient presenting PAS II with simultaneous occurrence of type 1 diabetes, adrenal insufficiency, and severe hypothyroidism. The patient presented with abdominal cramps, hyperglycemia (450 mg/dl), and metabolic acidosis. Intravenous insulin and fluid replacement were initiated however in the next hours hypoglycemia and hemodynamic instability followed and the patient was transferred to the ICU. Laboratory findings revealed electrolyte imbalances (hyponatremia with hyperkaliemia) and adrenal insufficiency was suspected and later confirmed with cortisol levels of 10.2 ng/ml (n.v 28 – 140 ng/ml) and ACTH 106,9 ng/ml (n.v 7 – 30) pg/ml. Severe hypothyroidism with TSH of 250 mUI/L and FT4 below the normal range was also diagnosed. Treatment with hydrocortisone and levothyroxine was promptly started facing therapeutic challenges in managing PAS-2 patients with concurrent endocrine disorders. The patient's condition stabilized after intensive care management.

Discussion:
Simultaneous occurrence of T1DM, adrenal insufficiency, and severe hypothyroidism is rare. Hypoglycemia in T1DM can obscure adrenal insufficiency, complicating diagnosis. Managing these concurrent endocrine disorders involves cautious administration of glucocorticoid therapy alongside thyroid hormone replacement to prevent adrenal crisis exacerbation.

Conclusion:
Managing patients with PAS-2 and concurrent endocrine disorders poses diagnostic and therapeutic challenges. Early recognition and optimized treatment are crucial for improving patient outcomes.atient outcomes.

QUALITY OF LIFE AND DIABETES

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There are various ways in which the concept "quality of life" is defined in the literature. One comprehensive definition describes quality of life as our experience of life, considering objective circumstances in which we live and the situations we face. Our perception of the world around us is shaped by our personality traits and past experiences.

The quality of life of individuals with type 2 diabetes is influenced by the complications of the disease and comorbidities, the level of stress in managing diabetes, social support, and many other factors, including age, gender, socioeconomic status, and duration of the disease.

A study on the quality of life of individuals with type 2 diabetes and chronic complications was conducted at the University Clinic Vuk Vrhovac, University Hospital Merkur, in which, for the first time in Croatia, partners of affected individuals' quality of life was included as a variable. Partners of the affected individuals rated the quality of life lowest in the social functioning domain; caring for the affected individual disrupts their social and family life, and they report physical and mental exhaustion. Overall, individuals with type 2 diabetes, regardless of the presence of complications, are least satisfied with their physical functioning. Of all the domains studied, the group of patients with diabetic retinopathy rated their quality of life lowest in the social functioning domain.

For the treatment of diabetes, the patient's active involvement in self-care is crucial, which is possible with psychological support that makes it easier to accept the disease and cope with it. It is necessary to provide support and education to relatives of patients, especially those patients whose self-care is not sufficient for self-care of the disease. A multidisciplinary approach should become a priority in future interventions to empower patients to achieve optimal disease control, recognize the importance of their role in treatment, and do everything possible to delay the development of chronic complications.

Keywords: quality of life, type 2 diabetes, social support, education, self-care of the disease

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- **LIZIN** - pomaže u sprječavanju stvaranja glikiranih proteina [5-7]
- **ARGININ** - pomaže poboljšati osjetljivost na inzulin [8-12]

*Arginin, koji ima ulogu u osjetljivosti na inzulin. Lizin, pomaže sprječavanje glikacije proteina. HMB, pomaže zdravlje mišića.
ARG - arginin, LYS - lizin, HMB - ß-hidroksi-ß-metilbutirat

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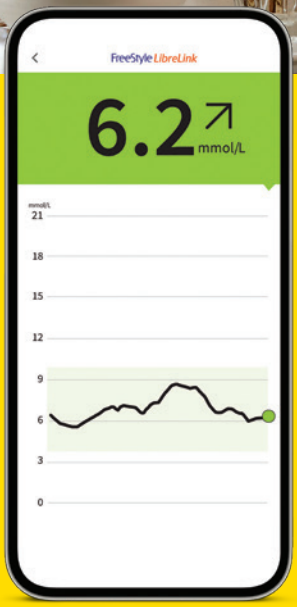

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