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Abstracts from the Congress of the Central European Diabetes Association (CEDA), June 8–10, 2023 in Bucharest (Romania)

This year's CEDA Congress was organised by Prof. Anca Pantea Stoian in Bucharest. The highly successful congress was attended by more than 450 participants. More than 100 speakers from Europe discussed science, technology and interaction in order to build strong partnerships in diabetology at the Central European level. We continued our tradition to give awards for the best oral and poster presentaions. All accepted abstracts are summarised below.

Oral Presentations (OP)

OP 1

Towards precision diabetes medicine based on individualized subtyping

Ioana Păunică, Simona Ștefan, Doina Andrada Mihai, Anca Pantea Stoian, Cristian Serafinceanu – Bucharest, Romania

Background: Coronary heart disease (CHD) is a major cause of morbidity and mortality among patients with diabetes. Dyslipidemia is a well-established risk factor for CHD. High levels of low-density lipoprotein cholesterol (LDL-C) and low levels of high-density lipoprotein cholesterol (HDL-C) are strongly associated with an increased risk of CHD. Apolipoprotein A1 (apoA1) and Apolipoprotein B (apoB) are essential components of lipoprotein particles and have been shown to play a crucial role in lipid metabolism. The apoB/apoA1 ratio has been proposed as a potential biomarker for CHD risk, with several studies reporting that it may better predict CHD risk than traditional lipid measures. However, the clinical utility of measuring apoA1 and apoB, as well as the apoB/apoA1 ratio, in CHD risk assessment in patients with diabetes remains unclear.

Aims: The present study endeavours to examine the potential connections between apoA1, apoB, and the apoB/apoA1 ratio with coronary heart disease risk in a cohort of patients diagnosed with diabetes. Additionally, this investigation aims to investigate whether any association exists between apoA1 and apoB with anthropometric and body composition parameters. Finally, the study also compares the differences in apoA1, apoB, and the apoB/apoA1 ratio between patients with diabetes and individuals without the disease.

Patients and methods: This cross-sectional study recruited 76 hospitalised patients, so far, with previously diagnosed type 2 diabetes mellitus at the Paulescu Institute between May 2022 and September 2022. The inclusion criteria included individuals aged between 20 and 79 years with type 2 diabetes mellitus but without a history of atherosclerotic cardiovascular disease (ASCVD). Anthropometric measurements, laboratory parameters (including ApoA1 and ApoB), and body composition assessments were conducted. Additionally, the UK Prospective Diabetes Study (UKPDS) and ASCVD risk calculators were employed to determine CVD and CHD risk scores. Finally, we performed statistical analyses using SPSS, using the Spearman rank correlation analysis to evaluate the covariation between variables.

The study was approved by the Ethics Committee of the Carol Davila University of Medicine and Pharmacy, Bucharest and was conducted by the Declaration of Helsinki. All patients provided written informed consent before participation.

Results: Main diabetes duration in the group was eight years (±6.9), and the mean HbA_{1c} was 7.8 % (±1.4). Elevated ApoB and ApoB/ApoA1 values were detected even in patients with normal range LDL-C. Furthermore, the non-HDL/HDL ratio positively correlated with ApoB (p = 0.00) and ApoB/ApoA1 ratio (p <0.01). Of note, a significant positive correlation was observed between ApoB and ApoB/ApoA1 ratio with CHD risk (p = 0.01 and <0.01, respectively). Moreover, ApoB/ApoA1 ratio was positively associated with fatal CHD risk (p = 0.00).

Conclusion: Our study highlights the importance of measuring ApoB and ApoA1 values to calculate the ratio. Patients with normal LDL-C can have elevated ApoB or ApoB/ApoA1 ratio. Our findings suggest that the ApoB/ApoA1 ratio positively correlates with CHD risk, particularly fatal CHD risk, in patients with type 2 diabetes. These results emphasise the potential utility of ApoB and ApoA1, as well as the ApoB/ApoA1 ratio, in CHD risk assessment in this population.

OP 2

Once-weekly subcutaneous semaglutide use in GLP-1 naïve patients with type 2 diabetes in North Macedonia: real-world data from the MIRAGE study

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Background: Safety and efficacy of once weekly (OW) subcutaneous (s.c.) semaglutide in T2D patients has been established in phase 3 clinical trials. In North Macedonia, no real-world evidence studies were conducted so far to assess the use of once weekly (OW) semaglutide in routine clinical practice.

Aims: To investigate glycaemic control and changes in specific clinical outcomes among GLP-1 naïve T2D adult patients who initiated OW semaglutide in local clinical practice.

Patients and methods: MIRAGE was an approximately 30-week, multicentre, single-arm, retrospective, non-interventional study assessing the glycaemic control and other parameters in GLP-1 naïve adult T2D patients who initiated OW semaglutide in routine clinical practice in North Macedonia. Adult patients with T2D initiated with OW semaglutide at least 30 ± 4 weeks prior to data collection with baseline HbA_{1c} and at least one HbA_{1c} after baseline were enrolled. Primary endpoint was change in HbA_{1c} from baseline to end of study (EOS; ~30 weeks). Other endpoints included changes in body weight (BW), waist circumference (WC), fasting plasma glucose (FPG), lipid parameters and blood pressure.

Results: 314 patients were enrolled in the study with mean baseline HbA_{1c} of 9.0 %, FPG –11 mmol/L and BMI-36.3 kg/m². At 30 weeks the estimated mean change in HbA_{1c}, BW and FPG was –2.2 %-point (95 % CI [–2.32, –2.08]; p <0.0001); –9.0 kg (95 % CI [-10.16, –7.81]; p <0.0001) and –4.1 mmol/L (95 % CI [–4.29; –3.90]; p <0.0001), respectively.

Conclusion: MIRAGE study provided valuable insights into how OW semaglutide performs in routine clinical practice in adult patients with T2D in North Macedonia. Although this is a single arm study, data demonstrated a clinically relevant and statistically significant reduction in HbA_{1c} (%), FPG and body weight in GLP-1 naïve adult patients who initiated OW semaglutide treatment and clinically meaningful improvement in other cardiometabolic parameters.

OP 3

A patatin-like phospholipase domain-containing 3 gene variant is more prevalent with declining kidney function in people with recent-onset diabetes

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Background: Recent studies identified distinct endotypes of diabetes with differences in metabolic features and risk for diabetes-related complications. Of note, persons allocated to the severe insulin resistant diabetes (SIRD) endotype show increased prevalence of non-alcoholic fatty liver disease (NAFLD) and chronic kidney disease (CKD). The rs738409 single-nucleotide polymorphism (SNP) in the patatin-like phospholipase domain containing 3 (PNPLA3) gene associates with increased risk of NAFLD progression yet its association with CKD remains controversial.

Aims: The present study examined whether the rs738409 SNP differently associates with NAFLD, adipose tissue insulin resistance and CKD in endotypes of recent-onset diabetes.

Patients and Methods: Participants with recently diagnosed diabetes (n = 707) from the prospective German Diabetes Study (GDS) underwent k-means clustering, genotyping, magnetic resonance spectroscopy to measure hepatocellular lipid content (HCL) and laboratory analyses including calculation of glomerular filtration rates (eGFR) and estimates of adipose tissue insulin resistance.

Results: SIRD are more frequently carriers of the G-allele in the rs738409 SNP and had the lowest eGFR and highest HCL compared to severe insulin deficient, moderate obesity-related, moderate age-related and severe autoimmune diabetes endotypes (all p <0.05). SNP carriers in the SIRD cluster also had greater adipose tissue insulin resistance than non-carriers. HCL was negatively associated with eGFR (r=-0.287, p <0.01) across all groups. Further stratification by PNPLA3 G-allele carrier status did not reveal any association between HCL and eGFR in any of the diabetes endotypes. However, with declining eGFR the proportion of G-allele carriers increased from 44 % for eGFR >60 ml/min to 52 % for eGFR <60 ml/min (p <0.05).

Conclusion: Persons with SIRD, more frequently carriers of the rs738409 variant, are at the highest risk for CKD and NAFLD. However, independently of diabetes endotype, the rs738409 variant might be involved in the progression of CKD.

Poster Presentations (P)

P 1

The analysis of potential predictors for acute pancreatitis development in patients with diabetic ketoacidosis

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Background: Diabetes ketoacidosis (DKA) is a life-threatening acute complication of diabetes. Acute pancreatitis (AP) is a critical condition that has been infrequently reported in patients with DKA. The overlap of their symptoms may potentially mask the respective diagnoses and contribute to bad treatment outcome.

Aim: Our aim was to analyse potential risk factors in developing AP in patients with DKA

Patients and methods: A retrospective observational study was conducted, including 120 patients with DKA. Diagnosis of DKA was made according to the American Diabetes Association (ADA) criteria. Acute pancreatitis was diagnosed using the Atlanta criteria. Patients with known causative factors such as choledocholithiasis or chronic alcohol use were excluded from the study. According to the presence of AP, patients were divided into group A (DKA+AP+, N = 19) and group B (DKA+AP-, N = 101). Demographic and clinical data was obtained.

Results: AP was diagnosed in 19 patients with DKA (16 %). Group A had higher FPG (28.5 ± 4.2mmol/l vs 22.3 ± 3.5mmol/l, $p < 0.05$), HbA_{1c} (14.5 ± 1.2 % vs 11.0 ± 1.5 %, $p < 0.05$), Tgc (24.2 ± 5.1mmol/l vs 4.5 ± 1.6mmol/l, $p < 0.001$), TC (12.5 ± 3.1mmol/l vs 7.9 ± 2.2mmol/l, $p < 0.05$), and amylase (175.4 ± 21.5U/L vs 90.2 ± 11.4U/L, $p < 0.05$) levels, as well as lower HDL-c (0.6 ± 0.2mmol/l vs 0.9 ± 0.2mmol/l, $p < 0.05$), pH (7.1 ± 0.7 vs 7.25 ± 0.9, $p < 0.001$) and bicarbonates (8.5 ± 1.3 vs 12.4 ± 3.5, $p < 0.001$) levels, compared to group B. Multivariable regression analysis showed Tgc (OR 13.5, $p < 0.05$) and pH (OR 5.6, $p < 0.05$) as independently

associated with AP development. The ROC curve showed that areas under the curve for the level of Tgc >15.5mmol/ and pH <7.15 were 0.93 (p <0.001) and 0.91 (p <0.05), respectively.

Conclusion: Our results imply that severe hypertriglyceridemia (>15.5mmol/L) and severe DKA (with pH <7.15) might be the potential predictors of development of AP in patients with DKA.

Key words: acute pancreatitis, diabetes ketoacidosis, hypertriglyceridemia

P 2

Non-alcoholic fatty liver disease in Type 2 Diabetes Mellitus – An observational study

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Background: Non-alcoholic fatty liver disease (NAFLD) has become the leading cause of liver disease worldwide, and its trend is maintained given the high prevalence of metabolic syndrome conditions (obesity, type 2 diabetes mellitus (T2DM), hypertension, dyslipidemia, etc.). The diagnosis is challenging because of the need for a practical, inexpensive, and widely available tool in the clinic. Therefore, a non-invasive test was proposed to evaluate steatosis, such as the Fatty Liver Index (FLI) score. Fibrosis-4 Index (FIB-4), AST to Platelet Ratio Index (APRI), and FORNS index are commonly used to assess fibrosis scores.

Aim of the Study: This study aims to evaluate the relationship between the severity of NAFLD evaluated with non-invasive markers for fibrosis (FIB-4, APRI, and FORNS index) and the use of anti-diabetic medications in clinical practice.

Material and Methods: Between 1st January 2022 and 16th April 2023, we evaluated 74 patients with T2DM hospitalized at The National Institute of Diabetes, Nutrition, and Metabolic Diseases „N. Paulescu" Bucharest. After obtaining the informed consent, clinical and paraclinical data were collected. In addition, we included 40 patients with NAFLD and analyzed them.

Results and Discussions: The group's characteristics were: 51.1 % male, with a mean age of 58.44 ± 11.88 years, with a mean duration of diabetes of 9.79 ± 10.13 years, 39.18 % of whom had hepatic steatosis on abdominal echography.

We obtained a statistically significant difference between those without hepatic steatosis versus those with steatosis in terms of age (56.64 vs 60.95 years), mean durations of T2DM (12.7 vs 14.3 years) and body mass index (BMI) (30 kg/m^2 vs 32.72 kg/m^2).

Among those evaluated, only 1.9 % had an FLI score of fewer than 30 points, while 77.77 % scored more de 60 points. Regarding the fibrosis non-invasive tests, 3.7 % of the patients had an APRI score above the cut-off as well as for the FORNS index, and 22 % obtained more than 1.3 for FIB-4. Therefore, patients with values above the cut-off should be referred to speciated hepatological centres.

We subdivided the patients by the FLI score into three groups (>60, 60 – 30; <30) according to the risk of the development of NAFLD. Among those at high risk (>60), 62.96 % were treated with metformin, 22.22 % had Glucagon-like peptide-1 Receptor Agonists (GLP-1RA), 11.11 % Sodium-glucose Cotransporter-2 inhibitor (SGLT2-i) and only 3.7 % had Dipeptidyl peptidase 4 (DPP-4) inhibitors. A statistically significant association was observed between a higher FLI score (>60) and the administration of metformin. Among the second and third groups, a small proportion of patients (3.7 %) had metformin in their treatment.

Additionally, 44 % of those patients had basal-bolus insulin therapy, in comparison to 14.8 % from the second group (FLI = 30 – 60) and 3.7 % from the third group (FLI<30).

Conclusion: The non-invasive tests remain an easy-to-use tool for evaluating patients at high risk for the progression of NAFLD, especially in a tertiary centre. Regarding anti-diabetic medication, metformin remains a frequent-use option for those patients with FLI score more than 60, despite the potential benefits of GLP1 RA and SGLT2-i on NAFLD.

Keywords: Non-alcoholic fatty liver disease, type 2 Diabetes Mellitus, non-invasive marker, anti-diabetic medication.

P 3

Effect of semaglutide on subclinical atherosclerosis and cardiometabolic compensation: a real-world study in patients with type 2 diabetes

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Background: Semaglutide is the most recently approved agent among glucagon-like peptide-1 receptor agonists (GLP-1RA). Several trials have suggested the protective effect on cardiovascular (CV) risk of injectable semaglutide by reducing major adverse cardiovascular events in type 2 diabetes-treated patients versus placebo. Although several hypotheses have been proposed to explain CV benefits, with preclinical evidence supporting an effect on atherosclerosis, the protective mechanisms of semaglutide have been scarcely investigated in clinical practice.

Methods: A retrospective observational study was conducted among 40 consecutive type 2 diabetes patients treated with injectable semaglutide. The primary aims were to assess the carotid intima-media thickness (cIMT) and hemoglobin A1c (HbA_{1c}) levels. Secondary aims were the evaluation of anthropometric, glycemic, hepatic parameters and plasma lipids, along with the assessment of triglycerides (TG)/HDL ratio, hepatic steatosis and fibrosis markers, and triglyceride glucose index.

Results: Injectable semaglutide significantly reduced HbA_{1c} and cIMT. An improvement in all traditional CV risk factors and TG/HDL ratio was reported in the overall population. Correlation analyses showed that hepatic steatosis and fibrosis indices and the anthropometric, glycemic, hepatic parameters, and plasma lipids were unrelated to the variations in cIMT and HbA_{1c}.

Conclusions: Our findings support the effect of injectable semaglutide on atherosclerosis as a key CV protective mechanism. Moreover, considering the favorable effects on atherogenic lipoproteins and hepatic steatosis indices, our

results suggest the pleiotropic effect of semaglutide beyond glycemic control.

Keywords: Semaglutide; Carotid intima-media thickness; Cardiovascular risk; Type 2 diabetes.

P 4

How Effective are Anti-diabetic Therapies in Controlling Glycemic Levels and Body Composition in Type 2 Diabetes Mellitus Patients?

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Background: Type 2 Diabetes Mellitus (T2D) is a prevalent chronic metabolic disorder characterised by insulin resistance and hyperglycemia. This condition can lead to various complications, including cardiovascular disease, neuropathy, and kidney damage. The primary objective of T2D treatment is to maintain glycemic control and prevent the onset or progression of these complications. Metformin, known for its efficacy, safety, and affordability, is commonly used as a first-line treatment. However, some patients require additional antidiabetic drugs for optimal control.

Aims: The study aimed to compare and evaluate the effectiveness of different antidiabetic therapies in managing T2D. Focusing on clinical outcomes like glycemic control, body composition, blood pressure, lipid profile, and renal function over a year, the study intended to provide comprehensive insights into the relative efficacy, safety, benefits, and drawbacks of various therapies.

Patients and Methods: This prospective study started in September 2020 at the Ambulatory of the Paulescu Institute in Bucharest, Romania. It involved 167 patients, aged 20–79, with T2D. Participants were categorised into six groups based on their antidiabetic treatment regimen: metformin monotherapy, sulfonylureas, SGLT-2 inhibitors, incretins, basal insulin, and a basal-bolus insulin regimen.

Results: The metformin monotherapy group constituted 35 % of the total patients, sulfonylureas 7 %, SGLT-2 inhibitors 11 %, incretins 11 %, basal insulin treatment 20 %, and basal-bolus insulin regimen 15 %. The patients treated solely with metformin had the shortest mean diabetes duration (4.6 years), while the longest was noted in the basal-bolus insulin regimen group (10.4 years). The metformin group also exhibited the lowest mean BMI (27.3 kg/m²), and the basal-bolus insulin group had the highest (32.9 kg/m²). The incretin group had the highest mean fat percentage (39.3 %). Regarding glycemic control, the metformin group had the lowest mean HbA_{1c} (6.7 %), whereas the highest was found in the basal-bolus insulin group (9.2 %).

Conclusion: These findings underscore the importance of tailoring antidiabetic treatment to individual patient characteristics and clinical situations. Providers should consider various factors, such as glycemic control, BMI, fat percentage, and diabetes duration when selecting appropriate therapy. Such a personalised approach could improve patient outcomes and mitigate complications associated with T2D.

P 5

Left ventricular layer-specific deformation in uncomplicated patients with diabetes mellitus and acute hyperglycemic episodes

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Background: Acute hyperglycemic episodes, defined as blood glucose levels at hospital admission measured to be ≥ 11.1 mmol/l, are linked to lower glucose uptake and it is an important risk factor for cardiovascular event in patients with diabetes mellitus.

Aim: Our aim was to analyse the effects and reversibility of acute hyperglycemia on layer-specific left ventriculi deformation in uncomplicated diabetic patients (without cardiovascular disease).

Patients and methods: This follow-up study included asymptomatic, normotensive patients with uncomplicated diabetes mellitus with acute hyperglycemia (Group A, n = 67), patients with diabetes mellitus but with optimal metabolic control (HbA_{1c} <7 %) (Group B, n = 20) and healthy controls (Group C, n = 20). All study subjects underwent laboratory analyses and complete two-dimensional speckle tracking echocardiography examination (2D-STE). 2D-STE was repeated in group A at the time euglycemia was achieved (second examination after 72 hours of i. v. continuous insulin treatment) and 3 months from onset of acute hyperglycemia (third examination).

Results: There was a statistically significant difference in glycemic control which was noted from initial to third examination. From upon hospital admission to the second examination blood glucose level drops dramatically. Then from the initial to the third examination blood glucose level slightly increases. Post hoc analysis showed statistically significant decrement in glycaemia level from first measurement to 3 months. HbA_{1c} level decrease significantly after 3 months. Between group C and patients with acute hyperglycemia upon hospital admission, as well as between another groups, there was statistical significant difference in 2D-STE radial strain on middle levels. In group A at second and third examination radial strain remained lower.

Conclusion: Acute hyperglycemia significantly affect left ventricular mechanics assessed by 2D-STE. Acute hyperglycemia show negative effect on left ventricular deformation in uncomplicated patients with diabetes mellitus by lower radial strain which was not reversible across all control examination.

P 6

Metformin associated lactic acidosis (MALA)

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Background: Metformin is the most frequent drug use to treat diabetes is well tolerated. Metformin associated lactic acidosis (MALA) is a rare well-known serious side effect of biguanides.

Case Presentation: In a last 10 years two cases are present in our hospital with MALA. The first case is a 56-year-old female, who was admitted in our hospital with acute confusional state, extreme fatigue, nausea, vomiting and anuria. She was in treatment with indomethacin for leg pains for more than one week. She was in treatment for high blood pressure

and diabetes with Lercanidipine, Irbersartan and Metformine 2550 g/day.

The second patient, 73 years old. She had performed an abdominal CT Scan with contrast and had used for a week diclofenac for abdominal pain. She had also type 2 diabetes in treatment with Metormin 2000 g/day and high blood pressure in treatment with valsartan.

Laboratory datas: Arterial Blood Gases showed severe lactic acidosis. pH = 6.9; lactate 21 mmol/L; potassium = 6.5 mmol/l (3.7 – 5.5), creatinine = 9.6 mg/dl (0.6 – 1.2) and blood urea nitrogen = 130 mg/dl (18 – 35).

They had been diagnosed with NSAID- induced acute injury and metformin-associated lactic acidosis (MALA) and were admitted to the intensive care unit and treated with intravenous fluid, diuretics, sodium bicarbonate and insulin to manage profound metabolic acidosis. The urgent hemodialysis session was done.

Since the first case continue to be with altered mental status and acidosis state an additional session of continue renal replacement therapy to remove metformin as done.

In both cases a progressive recovery was observed and patients were discharged from the intensive care unit on the fourth and fifth day.

Conclusion: Both cases had NSAID-induced acute kidney injury and MALA. Although rare condition, lactic acidosis should be considered in patients with acute kidney failure in treatment with metformin.

P 7

Impact of Liraglutide 3.0 mg for Weight Management among Women with Obstetrics and Gynaecology-Related Complications "OG-RC"

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Background: The global prevalence of obesity has nearly tripled during the last four decades, posing a major public health challenge worldwide. In 2016, around 39 % of adults aged 18 years and over were overweight, with a higher prevalence among women than men. Obesity is associated with several health risk conditions that disproportionately affect women's health, including reproductive and gynecologic disorders such as polycystic ovarian syndrome (PCOS), infertility, and pregnancy complications. Despite the high prevalence of obesity among women with obstetrics and gynecology-related complications (OG-RC), there is a big delay from gynecologist perspective in dealing with patients from weight loss perspective. Several studies have investigated the efficacy and safety of liraglutide 3.0 mg for weight management in women with OG-RC, with promising results. These studies suggested that liraglutide 3.0 mg can lead to significant weight loss, improved metabolic parameters, and potentially improved reproductive outcomes in women with PCOS and infertility.

Aim: This study aimed to evaluate the clinical impact of liraglutide 3.0 mg in improving female patients' weight and assessing its impact on improvements in their OG-RC.

Method: This is a retrospective study of participants took Liraglutide 3.0 m for ≥3 months' duration in the OB/GYN clinic at Dr Sulaiman Alhabib (Habib Medical Group) in Riyadh, Kingdom of Saudi Arabia (KSA). The primary endpoint was to assess the mean average weight loss among female patients using liraglutide 3.0 mg. The secondary endpoints include clinical improvement in OG-RC.

Results: At the end of the study, 31 patients met the inclusion criteria. The average weight loss was 7.9 kg or 8.7 % of the initial body weight. The BMI dropped by –3.1 kg/m^2. Most patients have lost more than 5 % of their initial body weight, while around half of the patients have lost >10 % of their initial body weight. The OG-RC have significantly improved during the clinical intervention period, 73.6 % of patients complaining from PCOS symptoms have improved, and two-thirds of the patients have an overall improvement in getting pregnant, while most patients have also tolerated the liraglutide 3.0 mg usage.

Conclusion: Liraglutide 3.0mg daily has shown significant clinical effectiveness towards weight loss among women visiting OB/GYN clinics with a clinical improvement in their OG-RC

Keywords: Women's health, PCOS, obesity, Liraglutide, IVF, weight loss

P 8

Mody – from a diabetologist's and a geneticist's perspective

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Background: Maturity Onset Diabetes of the Young (MODY) is a rare form of diabetes that is inherited in an autosomal dominant pattern and it is caused by mutations in genes that regulate insulin secretion and glucose metabolism. Due to its rarity and overlap with other types of diabetes, MODY is often misdiagnosed. Most cases of Mody are determined by mutations at the level of 4 genes HNF1A, GCK, HNF4A and HNF1B. This report presents 2 classic cases of MODY type 2 associated with mutations in the glucokinase (GCK) gene.

Case Report: In this report we present the cases of a mother and daughter who were both diagnosed with MODY. The mother, aged 42, was diagnosed with MODY at the age of 41, and her daughter, aged 16, was diagnosed at the age of 15. Initially, the daughter was misdiagnosed as type 1 diabetes and was recommended a low dose of basal insulin analogue which she did not administer. She was then misdiagnosed with type 2 diabetes and prescribed metformin. Values for fasting blood glucose were over 126 mg/dl, HbA_{1c} was between 6,1 % and 6,5 % and assays for specific autoimmunity (GAD, IA2, ZnTr8, ICA Antibodies) were negative. The presence of chronic complications specific to diabetes was not detected. There was a positive family history of diabetes (maternal grandmother and nine of her siblings). The maternal grandmother's test results for MODY were negative.

Conclusions: Recent advancements in genetic testing have made it more accessible to diagnose MODY and provide appropriate genetic counseling and treatment options for affected individuals and their family members. Mild, persistent, asymptomatic fasting hyperglycemia, familial aggregation are some of the features that should suspect GCK-MODY diabetes.

P 9

Underutilization of statin therapy in patients with diabetes mellitus, an alarming truth

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Background: Patients with diabetes mellitus (DM) have a higher cardiovascular risk and a higher incidence of cardiovascular disease, more so in the case of those patients that have a longer duration of the disease. Therefore, aside from proper glycaemic control, achieving lipid control through high intensity statin treatment is an integral part in the management of these patients, to reduce mortality through cardiovascular diseases.

Aims: The aims of this study were to evaluate the degree of statin use and if proper lipid control was achieved, in a population of patients with diabetes mellitus with a disease duration of longer than 10 years.

Patients and methods: In this cross-sectional, non-interventional study, we enrolled 74 patients with more than 10 years of DM, admitted for a routine check-up, in the Diabetes Clinic of County Emergency Hospital "Pius Brinzeu" in Timisoara, Romania, between January 2019 and July 2019. Data regarding the patient age, lipid profile, cardiovascular risk level and statin treatment were collected from patient medical records.

Results: Of the 74 patients in the study, 53 had T2DM and 21 had T1DM. Only 8 patients presented high cardiovascular risk, the other 66 had very high cardiovascular risk. Only 13 of the patients achieved adequate LDL cholesterol levels. Only 12 patients took high intensity statin therapy. What is troubling is that is that 45 % of the patients (n=33) did not take a statin. Even more alarming is the fact that only 3 of the 21 patients with T1DM reached target LDL levels and lack of statin therapy was more common in this group as 71 % (n=15) did not take statins.

Conclusion: The lack of adequate statin therapy is an alarming truth that must be addressed in the management of patients with DM.

P 10

The benefits of total body fat loss on liver fibrosis and steatosis after dapagliflozin in patients with type 2 diabetes

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Background: By inhibiting the sodium-glucose-2 co-transporter, glycosuria is triggered, a process by which an improvement in glycemic control and weight is obtained independently of pancreatic beta-cell function.

Aim: The objective of this study was to analyze the effect of dapagliflozin treatment on adipose tissue and liver function in patients with type 2 diabetes (T2DM).

Patients and methods: The study prospectively enrolled 80 adult patients with uncontrolled T2DM (HbA_{1c} >7 %). The subjects received treatment from their attending physician with 10 mg daily dapagliflozin in different therapeutic regimens. All patients performed complex investigations to evaluate the distribution of adiposity (cardiac ultrasound, computer tomography, liver elastography), routine lab analysis, and anthropometric measurements at baseline and 24-week follow-up. The final analysis included 53 subjects who successfully finalized the study protocol. The body fat (BF) percentage was estimated using the CUN-BAE formula. The threshold values for grading fibrosis were F2 ≥7 kPa, F3 ≥9.5 kPa, and F4 ≥12 kPa [1], respectively for grading steatosis: S1 ≥232.5 dB/m, S2 ≥235 dB/m, S3 ≥290 dB/m [2].

Results: The main study outcome was a total weight loss of 5 %, respectively, and 1.5 % BF. The study subjects presented moderate (12 %) to severe (88 %) liver steatosis at baseline. In dynamics, the mean fatty infiltration improved significantly from 363.6 ± 31.7 dB/m to 316.1 ± 52 dB/m in women, p = 0.001, and from 346.4 ± 54.3 dB/m to 315.6 ± 54.1 dB/m, in men, p = 0.02. Also, 49 % of the subjects initially presented at least significant liver fibrosis (F2-F4). Patients with severe liver fibrosis showed a 15.4 % stiffness decrease with marginal significance. The best outcome was observed in patients with >1.5 % BF reduction with a median of 2.3 kPa liver stiffness improvement (p = 0.02).

Conclusions: A reduction of >1.5 % BF significantly improves fatty infiltration and liver stiffness in T2DM patients under dapagliflozin treatment.

References:
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P 11

The impact of the COVID pandemic on patients with diabetes

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Introduction: The coronavirus pandemic represents the defining global health crisis of our times. The SARS COV2 infection had a negative impact on patients with diabetes, who had already been proven to be twice, even thrice as prone to infections compared to the general population.

Objective: The objective of the present study was to analyze the impact of the COVID pandemic on patients with diabetes.

Material and method: We conducted a non-interventional, longitudinal study that enrolled 139 patients. 44 (32 %) had type 1 diabetes mellitus (T1DM) and 95 (68 %) had type 2 diabetes mellitus (T2DM). Data regarding gender, age, area of provenance, type and duration of diabetes, weight, BMI, fasting blood glucose, and HbA_{1c} was collected from their charts corresponding to the interval between August 2019 and December 2022.

Results: For patients with T1DM, the average age was 50 years, and the median duration of the disease was 15 years. No significant differences were observed regarding the median glycemic values before and after the pandemic (160 mg/dl vs 191 mg/dl), the increase in HbA_{1c} was 0.4, from 8.52 % to 8.96 % (p = 0.07).

For patients with T2DM, the average age was 67 years, and the median

duration of the disease was 17 years. Unlike patients with T1DM, there were significant differences regarding the median glycemic values before and after the pandemic (155 mg/dl vs 214 mg/dl, p <0.0001), as well as the HbA_{1c} values (8.45 % vs 9.24 %, p = 0.0001). No significant differences were observed regarding weight and BMI neither in patients with T1DM: average body weight 74 kg vs 74.6 kg (p = 0.4), median BMI 26.7 kg /m² vs 25.7 kg/m² (p = 0.3), nor in patients with T2DM: 90 kg vs 90.5 kg, p = 0.3, median BMI 31.7 kg/m² vs 31.8 kg/m², p = 0.26).

Conclusions: The differences observed between patients with T1DM and T2DM in terms of basal glycemic values and HbA_{1c} came most likely as a consequence of the facilitation of the digital management of the disease, favored by the younger age of those with T1DM, as opposed to patients with T2DM, as they have managed to better and more easily access and use technology (internet, e-mail, telemedicine).

P 12

The assessment of steatofibrosis in patients with type 2 diabetes, correlations with components of the metabolic syndrome

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Background: Worldwide, 1 in 4 adults have NASH. In the countries of the European Union, a prevalence of approximately 20 % is recorded, expecting a prevalence of 40 % for the year 2030. NASH is associated with type 2 diabetes (T2DM), being in a close correlation with the components of the metabolic syndrome (MS).

Aims: The main aim was to investigate the prevalence of NASH in patients with T2DM, as well as to establish possible correlations between the degree of steatosis and fibrosis and with other components of MS.

Patients and Methods: This study included 130 patients with T2DM hospitalized in the Clinic of Diabetes, Nutrition and Metabolic Diseases of SCJUT between January and March 2023. The average age was 61,5 years and the average duration of the disease 12 years. A series of parameters were followed: BMI, glycemic control, lipid profile, renal profile, hepatic function and inflammatory syndrome. All the patients were investigated with Fibroscan Expert 630 device, based on which we determined the degree of steatosis and the degree of fibrosis.

Results: In the studied group, NASH was present in 99 patients with DM type 2 (76.15 %): absent S0 = 23.84 %, mild S1 = 18.46 %, moderate S2 = 23.84 % and severe S3 = 33.84 %. The prevalence of NASH was higher in females (77.77 %) than in males (74.13 %). Hepatic fibrosis was present in 11 patients (35.48 %) among those with moderate hepatic steatosis and in 18 patients (40.90 %) among those with severe hepatic steatosis. Direct correlations were observed between the fat load of the liver and some metabolic parameters.

Conclusions: A direct proportional relationship was observed between the presence of steatosis and liver fibrosis; the fibrosis being present in a significantly higher number of patients with moderate/severe hepatic steatosis. Close correlations were also highlighted between the presence of NASH and weight status, lipid parameters, or the degree of glycemic control.

P 13

The challenge of achieving lipid targets in Type 2 Diabetes Mellitus patients with high cardiovascular risk and established atherosclerotic cardiovascular disease

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Background: Patients with Type 2 Diabetes Mellitus (T2DM) are at high cardiovascular risk, with atherosclerotic cardiovascular events being the leading mortality cause in this category of patients. International guidelines recommend tight lipid targets in order to control atherosclerotic cardiovascular disease (ASCVD) in patients with T2DM.

Aim of the study: To evaluate the proportion in which lipid targets (LDL cholesterol, non-HDL cholesterol, serum triglycerides) are attained in a real-world T2DM patient cohort and what associations can be made.

Material and Method: We conducted a cross-sectional study, in which we included data from patients with T2DM admitted to a third-care centre for Diabetes Mellitus from January 2020 to April 2023. Patients with recent onset of the disease (less than six months) were excluded.

Results: From 1570 T2DM patients with complete data, 85 % were very high-risk, and 55.7 % had documented ASCVD. A proportion of 5 % of patients had triglycerides >400 mg/dl, therefore only non-HDL was calculated. 31.1 % of patients reached the LDL target, and 29.5 % reached the non-HDL target. Subgroup analysis showed that patients who obtained LDL and non-HDL targets had a higher age (p = 0.0001), longer duration of DM (p = 0.0001), were non-smokers (p = 0.047 for LDL target and p = 0.05 for non-HDL target) and had a lower A1c (p = 0.004 for LDL-target and p = 0.001 for non-HDL target). Also, significantly more insulin-treated patients did not reach the non-HDL target (p = 0.05). Comparative data are shown in Table 1. No significant differences were obtained for gender, body mass index, systolic blood pressure, and settlement and of patients with confirmed ASCVD, better achievement of LDL targets had patients with a history of stroke (33.5 %) vs myocardial infarction (29.1 %) vs lower extremity arterial disease (22.4 %).

Discussions: Patients with higher age and duration of diabetes seemed to reach more cholesterol targets, which can be explained by better compliance with lifestyle and treatment recommendations. Other markers for an overall reduced adherence were the associations between uncontrolled dyslipidemia and poor glycemic control, respectively active smoking,

Conclusions: Despite available treatment options, only a third of patients reached cholesterol targets and half the triglycerides targets. Dyslipidemia is often associated with other modifiable risk factors such as smoking, obesity, hypertension, and glycemic imbalance. More awareness should be raised on treatment goals in order to achieve control of all risk factors earlier as possible.

Key-words: LDL-cholesterol, non-HDL cholesterol, targets, type 2 diabetes mellitus, cardiovascular risk

P 14

Quality of life in the course of one-year advance hybrid closed-loop system use in adults with type 1 diabetes previously naive to advance diabetes technology – a milestone in treatment of diabetes

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Aim: To evaluate the effect of a one-year use of an advanced hybrid closed-loop (AHCL) system on the quality of life, level of anxiety and level of self-efficacy in adults with type 1 diabetes (T1D) previously treated with multiple daily injections (MDI) and naive to advanced diabetes technology

Methods: 18 participants of a previously published three-month randomized trial (10 men, age 40.9 ± 7.6 years) who were switched directly from MDI/BMG to AHCL, completed 12 months of MiniMed 780G™system use (a three-month randomized trial followed by a nine-month follow-up phase). At month six of the study patients were switched from sensor GS3 (Continuous Glucose Monitoring) system, powered by Guardian™ Sensor 3) to GS4. Quality of life was assessed using the Polish validated version of the 'QoL-Q Diabetes' questionnaire. The level of anxiety was evaluated with the use of the State-Trait Anxiety Inventory (STAI). Self-efficacy was assessed with General Self-Efficacy Scale- (GSES). Results were obtained at baseline and at the end of the study.

Results: Significant increase in QoL was reported in the global score (p = 0.02) and in as many as 11 out of 23 analyzed areas of life: Being physically active (p = 0,02); Feeling well (p = 0.00); Feeling in control of my body (p = 0,00); Looking good (p = 0.00); Working (p = 0.00); Sleeping (p = 0.01); Eating as I would like (p = 0.00); Looking after or being useful to others (p = 0.02); Being active with pets / animals (p = 0.00); Being spontaneous (p = 0.02); Doing "normal" things (p = 0.02). Both state (p = 0.04) and trait (p = 0.02) anxiety decreased while the general self-efficacy significantly increased (p = 0.03). No participant decided to stop the use of the pump.

Conclusion: Adults patients with T1DM previously treated with MDI and naïve to modern technologies after transition to AHCL system after 12 of treatment experience significant improvement in their psychological well-being.

Key words: Quality of life, Advanced Hybrid Closed-Loop System, Diabetes Type

P 15

Effect of semaglutide versus other GLP-1RAs on glycemia and other cardio-metabolic risk factors among subjects with type 2 diabetes mellitus: a systematic review and meta-analysis of head-to-head, phase 3, randomized controlled trials

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Introduction: Glucagon-like peptide-1 receptor agonists (GLP-1RAs) have emerged as a cornerstone treatment for type 2 diabetes mellitus (T2DM). The aim of the present meta-analysis was to assess whether semaglutide exerts greater effects on glycemia and other cardio-metabolic risk factors compared to other GLP-1RAs.

Methods: PubMed and Cochrane Library databases, along with grey literature sources, were searched form inception to 8th February 2023, in order to retrieve head-to-head, phase 3 randomized controlled trials (RCTs) assessing the effect of semaglutide versus other GLP-1RAs on glycemia and other cardio-metabolic risk factors in T2DM.

Results: We finally pooled data from 5 RCTs. Semaglutide compared to other GLP-1RAs provided a significantly greater reduction in HbA_{1c} levels by 0.44 %, in fasting plasma glucose by 0.48 mmol/l, in body weight by 2.53 kilograms and in body mass index by 0.91 kg/m^2. Subjects receiving semaglutide experienced significantly greater odds for achieving target and optimal HbA_{1c}, along with significantly greater odds for weight loss greater than 5 % and 10 %. However, subjects randomized to semaglutide also experienced significantly greater odds for gastrointestinal adverse events and treatment discontinuation.

Conclusion: Semaglutide is more effective than rest GLP-1RAs, in terms of improvement in glycemia and other cardio-metabolic risk factors, among individuals with T2DM.

Keywords: Semaglutide, glucagon-like peptide-1 receptor agonist, type 2 diabetes, glycemia, risk factor

P 16

Six-month periodic fasting does not affect somatosensory nerve function in type 2 diabetes patients

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Background: Diabetic sensorimotor polyneuropathy (DSPN) is the most common complication of diabetes. Current strategies for preventing DSPN are limited.

Aim: We aimed to examine the effects of periodic fasting on diabetic somatosensory nerve function in patients with type 2 diabetes.

Patients and methods: Somatosensory nerve function was assessed in 31 patients with type 2 diabetes (HbA_{1c} 7.8 ± 1.3 % [61.4 ± 14.3 mmol/mol]) before and after a six-month diet, either with a fastingmimicking diet (FMD) (n=14) or a control Mediterranean diet (M-Diet) (n=17). Outcome measures included clinical neuropathy disability score, neuropathy symptoms score, nerve conduction velocity and quantitative sensory testing (QST). 13 participants underwent diffusion-weighted high-resolution magnetic resonance neurography (MRN) of the right leg before and after the diet intervention.

Results: Baseline values of clinical neuropathy scores were comparable with values after the diet intervention between study groups. Motor NCV of tibial nerve in the M-Diet group

decreased by 12 % after six months (p = 0.04), whereas this was not the case in the FMD group (p = 0.39). Compound motor action potential (CMAP) of tibial nerve did not change in M-Diet group (p = 0.8) and increased in the FMD group by 18 % (p = 0.02). In QST the M-diet-group showed a decrease by 45 % in heat pain threshold (p = 0.02), whereas no such change was observed in the FMD group (p = 0.50). Longitudinal MRN analysis showed stable fascicular nerve lesions irrespective of the degree of structural pathology upon initial presentation.

Conclusions: Our study shows that six-month periodic fasting was safe and had no detrimental effects on somatosensory nerve function in type 2 diabetes patients.

P 17

Artificial Intelligence and ChatGPT in Diabetes Management: Improving Patient Outcomes and Reducing Complications

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Background: Diabetes is a chronic disease that affects over 400 million people worldwide. Current diabetes management involves frequent blood glucose monitoring, medication administration, and lifestyle optimization. However, these approaches have limitations, including the burden of self-monitoring and the high cost of medical care.

Aims: The aim of this study is to explore the potential of artificial intelligence (AI) and ChatGPT in diabetes management and their influence on patient outcomes.

Methods: A comprehensive review of the literature was conducted to identify relevant studies and reports related to AI, ChatGPT, and diabetes management. A total of 75 studies were included in the analysis, based on their relevance to the research question and the quality of their methodology.

Results: The results of this study suggest that AI and ChatGPT have the potential to improve diabetes management by providing personalized and accessible information to patients, enhancing communication between patients and healthcare providers, and improving patient outcomes. For example, a recent study found that an AI-based diabetes management system achieved better glycemic control and reduced the risk of hypoglycemia in patients with type 1 diabetes by 34 % compared to standard care. Another study showed that an AI-powered ChatGPT system improved diabetes self-management skills and reduced diabetes-related distress in patients with type 2 diabetes by 25 %. Moreover, AI can assist healthcare providers in identifying high-risk patients and tailoring treatment plans accordingly.

Conclusion: Based on the review of 75 relevant studies, AI and ChatGPT have the potential to revolutionize diabetes management by providing personalized and accessible information to patients, enhancing communication between patients and healthcare providers, and improving patient outcomes. However, there are still challenges to implementing AI and ChatGPT, including the need for further research, ensuring patient privacy and data security, and addressing potential biases in AI algorithms.

P 18

Anxiety in hospitalized patients with and without diabetes

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Background: The connection between diabetes mellitus (DM) and anxiety is demonstrated. Anxiety in people with DM is associated with increased risk of complications, reduced quality of life, and increased disability.

Aim: Assessing the frequency and severity of anxiety in hospitalized patients with and without DM.

Patients and methods: The descriptive study includes 250 patients (83 with DM type 1 (DM1), 117 with DM type 2 (DM2) and 50 without DM), hospitalized in IMSP SCR "Timofei Moșneaga", Chisinau, Republic of Moldova between August-December 2022. Hamilton, HADS and STAI scales were used for evaluation.

Results: Among those 200 patients with DM, according to the Hamilton scale anxiety is present in 91 % (of which 39.5 % is severe (21.5 % DM1 and 18 % DM2), 34 % moderate (12 % DM1 and 22 % DM2) and 17.5 % mild (6 % DM1 and 11 % DM2)) and absent in 9 % (1.5 % DM1 and 7.5 % DM2); and according to the HADS scale, anxiety is present in 63.5 % (27.5 % DM1 and 36 % DM2), extreme in 19.5 % (11 % DM1 and 8.5 % DM2) and absent in 17 % (2.5 % DM1 and 14.5 % DM2). In patients without DM, according to the HADS scale, anxiety was present in only 24 %, extreme in 2 % and absent in 74 % patients. According to the STAI questionnaire, 21 % patients with DM do not have anxiety; 13 % have anxiety as a trait and 66 % have anxiety as a state.

Conclusion: Anxiety in patients with diabetes is more common, usually moderate or severe, and is quantified as a state. Anxiety is more severe in patients with type 1 diabetes.

P 19

Complications of sequenced bariatric interventions – a clinical case

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We aim to present the case of a 57-year-old female patient referred to our clinic because of severe alteration of quality of life, generalized edema and diarrhea. The patient has type 2 diabetes, multiple bariatric procedures (sleeve gastrectomy in 2010 and Roux-en-Y gastric bypass in 2021), cirrhosis and malnutrition. Her story starts in 2010 when, because of increased weight (140 kg, BMI= 45,19 kg/m^2), she decides to perform sleeve gastrectomy followed by intense weight loss, down to 80 kg. After some years, due to a neurological condition impacting her ability for physical exercise, she experienced weight gain up to 127 kg and in 2020, after random blood tests, she was diagnosed with type 2 diabetes. To control blood sugar and to promote weight loss she received dulaglutide. Since weight loss was not significant, in 2021, she decided to undergo the second bariatric procedure. In the first few months after the intervention, she experienced multiple episodes

of vomiting and diarrhea and in June 2022, she presented severe abdominal pain. A diagnostic laparoscopy revealed a subphrenic abscess due to a gastro-ileal anastomosis fistula. After treatment, the patient was referred to our clinic where, by multiple investigations including Fibroscan and quantitative determination of vitamin B12 and folic acid, she was diagnosed with malnutrition cirrhosis caused by malnutrition related to bariatric surgery. At that time, she reached 70 kg, HbA_{1c} was 3,8 %, therefore dulaglutide was discontinued. In April 2023 the patient returns because of altered general status, accusing inability to walk unassisted, increased fatigue, edema and diarrhea. Tests showed that she had protein caloric malnutrition. We decided to measure pancreatic elastase in the stool which presented low values showing that she now suffers from pancreatic insufficiency, so we decided to initiate pancreatic enzymes treatment with improvement of her quality of life and symptoms.

P 20

Dysmetabolism-related early peripheral sensory dysfunction and its relationship to the development of diabetic peripheral neuropathy

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Aim: The aim of this study was to investigate the association of early peripheral sensory dysfunction (EPSD) determined by quantitative sensory testing (QST) with different factors related to dysmetabolism (indexes of insulin resistance-IR, Metabolic Syndrome-MetS) in individuals with and without type 2 diabetes (T2DM) without peripheral neuropathy (PN), and the impact of those factors on PN development.

Patients and methods: 225 individuals (108 and 117 with and without T2DM, respectively) without PN based on clinical and electrophysiological criteria were analyzed. Comparative analysis was conducted between those identified as "healthy" and those with EPSD (neuropathic sensory phenotype, either thermal hyperalgesia, mechanical hyperalgesia or sensory loss) based on QST. 196 were followed-up over a mean of 2.64 years.

Results: In participants without T2DM, in addition to male gender, height, higher fat and lower lean mass, higher IR (HOMA-R: OR 1.70, $p = 0.009$, McAuley index OR: 0.62, $p = 0.008$), were independently associated with EPSD. In patients with T2DM, MetS (OR 18.32, $p < 0.001$) and skin advanced glycation end-products (AGEs, OR 5.66, $p = 0.003$) were independent predictors of EPSD. In longitudinal analysis, T2DM (HR 3.32 vs. no DM, $p < 0.001$), EPSD (aHR 1.88 vs. healthy, $p = 0.049$ adjusted for DM and sex), higher IR and AGEs predicted PN development. Among the EPSD-associated sensory phenotypes, "sensory loss" was most strongly associated with PN development (aHR 4.35, $p = 0.011$).

Conclusion: This study demonstrates the utility of a standardized QST-based approach in identifying early sensory deficits in individuals with and without T2DM. These are associated with a dysmetabolic status signified by IR markers, MetS and higher AGEs which in turn are shown to influence PN development.

P 21

Insulin autoimmune syndrome – more frequent than we are aware of?

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Hirata's disease or insulin autoimmune syndrome is a rare condition with a prevalence of around 200 cases worldwide that occurs especially in Asian population. It is characterized by spontaneous hypoglycemic episodes in the presence of high titers of insulin autoantibodies (IAA). We aim to present the case of a Caucasian 61 year old female patient referred to our clinic because she experienced symptomatic hypoglicemic episodes during the last weeks, with blood glucose levels between 44 and 68 mg/dl. She was admitted for investigations. The oral glucose tolerance test (OGTT) showed an initial increase of blood glucose, up to 243 mg/dl, after 90 minutes, followed by a sudden decrease, reaching the value of 41 mg/dl after 200 minutes, when the test was stopped due to marked symptoms. We measured serum insulin and C peptide levels during the OGTT and observed an insulin to glycemia ratio with a value suggestive for organic hypoglycemia and a discrepancy between the serum level of C peptide (near normal) and of insulin (markedly increased). In the attempt to find the cause of this organic hypoglycemia, we saw no images suggestive for insulinoma on abdminal ultrasound and CT scan, we found no evidence of liver disease and no endocrine dysfunction. The measurement of IAA showed a high titer, confirming the diagnosis of Hirata's disease. Due to the rarity of this disease, there are no guidelines for management, but the literature suggests using corticotherapy. We decided to administer prednison, with a starting dose of 0.5 mg/kg bw/day followed by a stepwise decrease. The outcome was favorable, two months after stopping corticotherapy, the patient experienced a major improvement in quality of life, with no more fasting and only rare, mild postprandial hypoglycemic episodes.

P 22

Implementing PCSK9-i treatment in real-world scenarios – brief experience from a single center

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Introduction: Proprotein convertase subtilisin/kexin type 9 inhibitors (PCSK9i) are recommended for both secondary prevention, in patients with atherosclerotic cardiovascular disease, and primary prevention, in individuals with familial hypercholesterolemia (FH) and another significant risk factor, according to current recommendations. They may be considered in patients without FH, but at very high cardiovascular risk.

Aims: This retrospective study evaluated the efficacy of PCSK9 inhibitors in modifying lipid profiles in type 2 diabetes patients during the first six months of treatment.

Material and method: We retrospectively assessed electronic patient records for patients who received PCSK9 inhibi-

tors (alirocumab or evolocumab) with maximum-statin dosage and ezetimibe, between October 2021 and June 2022 in a diabetes outpatient clinic.

Results: PCSK9i were prescribed to a total of 19 patients , with a mean age of 62,68 (± 6.96) years (74 % male), of whom 17 had documented cardiovascular events and 2 had only cardiovascular risk factors. The mean duration of diabetes was 8,32 (± 6.16) years. Over the course of six months, lipid values changed considerably. The mean LDL-C was lowered from 84.00 to 34,75 mg/dl(58.48 % reduction) and the mean TC from 149,77 to 93,17 mg/dl (38.46 % reduction). TG decreased from 237,40 to 132,33 mg/dl (36.09 %). In terms of percent of patients reaching the LDL-C target of less than 55 mg/dl as per guidelines recommendations, 52.63 % attained this target. The average LDL-col value decreased by more than 50 percent in the first month of treatment.

Conclusion: PCSK9 inhibitors decreased LDL cholesterol and improved other lipid markers in patients with type 2 diabetes. These effects were visible as early as one month after treatment and lasted for throughout the entire six-month follow-up period. PCSK9 inhibitors are an effective treatment option for patients with type 2 diabetes who need to lower their lipoprotein levels to reduce their cardiovascular risk.

P 23

Sleep apnea syndrome in patients with and without diabetes type 2

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Background: The association of sleep apnea syndrome (SAS) in patients with diabetes mellitus type 2 (DMT2) worsens the evolution of diabetes by increasing cardiovascular disease morbidity and mortality.

Aims: Appreciation of risk for sleep apnea syndrome and degree of day time sleepiness in patients with and without diabetes mellitus type 2.

Patients and methods: The descriptive study includes 210 patients: 150 with DMT2 and 60 without DMT2, hospitalized in the „Timofei Mosneaga" Clinical Hospital, Republic of Moldova, in autumn 2022. The STOP-BANG and EPWORTH questionnaires were used.

Results: According to the STOP-BANG questionnaire, in DMT2 patients 56,6 % (23,3 % women and 33,3 % men) have a high risk for SAS; 31,3 % (18 % women and 13,3 % men) have an intermediate risk and 12,1 % (8,7 % women and 3,4 % men) have a low risk. In patients without DMT2, according to the STOP-BANG questionnaire: 26,6 % (10 % women and 16,6 % men) have a high risk for SAS; 38,4 % (11,7 % women and 26,7 % men) have an intermediate risk and 35 % (28,3 % women and 6,7 % men) have a low risk. According to the EPWORTH questionnaire 72 % (35,4 % women and 36,7 % men) of DMT2 patients have daytime sleepiness; 2,6 % (2 % women and 0,6 % men) severe daytime sleepines and 25,4 % (12,7 % women and 12,7 % men) absent daytime sleepiness. In patients without DMT2, according to the EPWORTH questionnaire, 68 % (33,3 % women and 35 % men) have daytime sleepiness, 32 % (16,7 % women and 15 % men) absent daytime sleepiness.

Conclusion: Most patients with diabetes have high and intermediate risk for SAS; and those without diabetes – intermediate and low. The risk for SAS is higher in men. Daytime sleepiness was present in both patients with and without diabetes.

P 24

Evaluation of psyho-emotional state, eating behaviour and self-care at home of patients with diabetes mellitus

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Background: The constant increase in the prevalence of diabetes globally has led to an elevated need for measurement tools in research, as well as for optimal individualized management. Validated medical questionnaires represent an efficient, frequently used and fast method in various fields of activity.

Aims: We aimed to establish any connections between eating patterns, psycho-affective states, and diabetes patients self-care at come.

Patients and methods: This is a retrospective observational non-interventional study enrolling 70 subjects in Diabetes Department from Timișoara, Romania between July 2022 and September 2022. The inclusion criteria were: subjects aged between 18 and 85 years with type 1 and type 2 diabetes mellitus, which were included in National Diabetes Programme. The patients were investigated using anthropometric parameters, biochemical determinations and completing the following validated questionnaires: The Summary Diabetes Self Care Activities Questionnaire and NEO-Five Factory Inventory which included the 5 types of personality: neuroticism, extraversion, openness, agreeableness and conscientiousness.

Results: The median age was 65.3 ± 10.3 years, the mean body mass index 31.48 kg/m^2 and the HbA_{1c} mean was 8.28 %. According to NEO FFI examination, a significant percentage is attributed to conscientiousness, and among the 5 personality types, openness was excluded. Using the Spearman coefficient, significant correlations ($p < 0.05$) were observed between agreeableness and neck circumference ($p = 0.033$), respectively SDSCA ($p = 0.022$) and between conscientiousness and the LDLc level ($p = 0.025$). Kruskal Wallis Test did not identify a correlation between the 4 personality categories and diabetes self-care.

Conclusion: The relationship between personality types, self care at home and dietary patterns in diabetic patients was not found to be statistically significant.

P 25

Very high risk Type 2 Diabetes Mellitus patients in a tertiary-care center: a comparative analysis

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Background: Atherosclerotic cardiovascular disease (ASCVD) is the leading cause of morbidity and mortality for individuals with diabetes mellitus (DM) and represents an important economic burden. Current guidelines recommend cardiovascular risk stratification and appropriate treatment.

Aim of the study: To analyze the profile of patients with Type 2 DM (T2DM) at very high cardiovascular risk emphasizing on the metabolic control achievement, presence of comorbidities and use of antidiabetic drugs in real life practice.

Material and Method: In this cross-sectional study, we included consecutively admitted patients with T2DM from one Department of a third-care center for Diabetes Mellitus during 2021-2023. Patients considered very high risk according to 2019 ESC Guidelines on Diabetes, Pre-Diabetes and Cardiovascular Diseases (having either documented ASCVD or risk factors which fulfill the criteria) were selected and then divided into two groups based on the presence of ASCVD. Clinical and biological profiles were compared.

Results: From 960 T2DM patients with complete data, 754 (78.53 %) were very high risk of which 414 (55.2 %) had documented ASCVD. Patients characteristics, biologic profile, comorbidities and the use of antidiabetic drugs were analyzed between the two groups and are synthetized in Table 1. Patients with ASCVD had lower A1c hemoglobin ($p<0.001$), LDL-cholesterol ($p<0.0001$), triglycerides ($p=0.02$), and were fewer active smokers ($p=0.03$). However, they had a higher age ($p<0.0001$) and associated more microvascular complications such as diabetic neuropathy ($p=0.02$) and renal impairment (lower eGFR- $p<0.001$, higher levels of albuminuria $p=0.02$). Heart failure was more frequent in the ASCVD group as well ($p<0.0001$). 31.9 % of patients benefited from cardioprotective antidiabetic drugs in the ASCVD group vs 20.3 % in the non-ASCVD group.

Conclusions: Patients with ASCVD associated more comorbidities, although these are independent conditions that contribute to inclusion in the very high risk category. Despite being far from targets, better lipid control was obtained for patients with ASCVD, as well as lower A1C hemoglobin levels which may be partly due to a raised awareness. Only a small percentage of patients benefited from cardioprotective molecules, although both categories were very high risk, and it should be emphasized that these antidiabetic classes should be used early in the DM evolution in order to prevent both micro and macro-vascular complications. Furthermore, SGLT-2 inhibitors prescription remains limited even given the high values of albuminuria.

Parameter	ASCVD group	non-ASCVD group	Statistical Significance (p)
N(%)	414 (55.2%)	• 340(44.8%)	
Male Gender (%)	70	52	—
Mean Age (years)	68.5±9.1	62.3±9.9	<0.0001
Insulin-treated type 2 DM(%)	61.7	77.4	—
DM mean duration (years)	15.7	9.4	—
Active smokers (%)	10.7	22.7	0.03
Mean BMI (kg/m2)	30.5±5.2	30.9±5.5	—
eGFR (ml/min/m2)	72.0±30.1	82.4±31.5	<0.001
ACR (mg/g creatinine)	456.2	200.1	0.02
LDL-cholesterol (mg/dl)	79.7±42.1	98.8±50.4	<0.0001
Triglycerides (mg/dl)	180.4	213.8	0.02
A1c hemoglobin (%)	9.1±2.4	9.8±2.3	<0.0001
High Blood Pressure	91.0	83.8	—
Myocardial Infarction(%)	21.2	—	—
Ischemic Stroke (%)	27.3	—	—
Lower extremities artery disease (%)	52.1	—	—
Heart Failure (%)	18.7	6.2	<0.0001
Diabetic peripheral neuropathy(%)	75.4	64.7	—
Diabetic retinopathy (%)	22.2	14	—
GLP1-Ra	18.5	16.9	—
iSGLT2	9.7	4.1	—
Sulfonylureas	7.8	7.1	
DPP-4 inhibitors	5.9	8.9	

Abbreviations: Diabetes Mellitus (DM), sodium-glucose cotransporter 2 inhibitor (iSGLT2), glucagon-like peptide 1 receptor agonist (GLP1-Ra), albumin to creatinine ratio(ACR)

P 25, Table 1: Study population characteristics

Key-words: type 2 diabetes mellitus, cardiovascular risk, atherosclerotic cardiovascular disease, cardioprotective medication, nefroprotective medication

P 26

Impact of laparoscopic sleeve gastrectomy on metabolic homeostasis and nutritional deficiencies: long-term follow-up

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Background: Obesity is recognized as a major health problem with continuously increasing prevalence. Bariatric surgery, beyond the weight loss, is considered as a "metabolic procedure" due to the effects it has on metabolic homeostasis.

Aims: We aimed to describe long-term clinical outcomes of laparoscopic sleeve gastrectomy (LSG) in terms of weight loss, metabolic homeostasis and nutritional deficiencies.

Patients and methods: A longitudinal, prospective, cohort study enrolling 60 patients (41.7 ± 12.5 years, 16.7 % males, body mass index 44.6 ± 9.9 kg/m^2) undergoing LSG was performed on a 5 years follow-up period. Ponderal therapeutic success, metabolic parameters, post-load hypoglycemia and nutritional status of vitamins and proteins, were assessed at baseline and at 1-, 3-, 12- and 60-months post-surgery.

Results: Our study indicated an early increase of insulin sensitivity index and metabolic clearance rate of glucose associated with decrease of estimated second phase of insulin secretion. Fasting glyce-

mia and HbA_{1c} improved significantly from the first month postoperatively, remaining stable thereafter.

The percentage of subjects with hypertriglyceridemia as well as in those with hypoHDL-cholesterolemia or hyperuricemia decreased significantly after the first year, remaining stable thereafter. The levels of LDL-cholesterol and total cholesterol decreased in the first year after LSG, but without statistical significance.

LSG induce high risk for cyanocobalamin and 25-OH-vitamin D deficiency and also high risk of hypoglycemia at 2-hour during OGTT at 1 year after bariatric surgery.

Conclusion: The results of this study proved the beneficial effects of LSG in terms of weight loss, improvement of metabolic profile noticeable early postoperative, but with the risk of hypoglycemia and nutritional deficiencies.

P 27

Association between serum uric acid with diabetes and liver steatosis

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Background: Diabetes respresent one of the most serious and common chronic diseases of our times. The global prevalence of diabetes had reached pandemic proportions, IDF reporting a prevalence of 9 % (463 million adults). The prevalence of hyperuricemia is approximately 20 % worldwide. Hyperuricemia in type 2 diabetes mellitus (T2DM) is associated with the progression of diabetes and markers of cardiovascular disease (CVD) and is also a significant risk factor for coronary artery disease. Nonalcoholic fatty liver disease (NAFLD) affects more than 25 % of the global population, being the most common cause of chronic liver disease and has an associated morbidity and mortality through liver-specific causes, but more importantly through adverse cardiovascular outcomes.

Aims: We investigated the association between hyperuricemia and NAFLD in subjects with diabetes and the association between serum uric acid (UA) and glycated hemoglobin (HbA_{1c}).

Patients and methods: The study included a number of 108 patients, with T2DM. For all patients included in the study: HbA_{1c} and serum value of uric acid were determined, and also all patients were evaluated for the presence of NAFLD by performing an abdominal ultrasound.

Results: In our study group 59 (54.6 %) patients were females and 49 (45.3 %) men. The average age of the group was 62 ± 10.78 years. The prevalence of hyperuricemia among our patients was 18.7 % (20 patients) and that of NAFLD was 56.4 % (61 patients). UA was positively correlated with HbA_{1c} level ($p = 0.039$) and with NAFLD ($p = 0.042$). We also observed a positive correlation between UA and boddy mass index ($p = 0.014$) and triglyceride level ($p = 0.045$).

Conclusions: Hyperuricemia was relatively common among T2DM patients and we also noticed an association with NAFLD. There is a need to raise awareness of lifestyle modification, healthy behavior and early diagnosis of hyperuricemia in type 2 diabetic patients and in patients with NAFLD.

P 28

Vitamin B12 deficiency in Diabetes Mellitus type 2 patients during treatment with Metformin

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Background: Metformin is the first line of treatment in Diabetes Mellitus type 2, but now it is reported that about 6-30 % of patients who are under treatment with metformin can have a vitamin B12 deficiency.

Aims: The aim of our study is to describe the prevalence of vitamin B12 deficiency in adults with DM type 2 who were under treatment with metformin compared to patients without diabetes.

Patients and Methods: The study included 150 patients aged 16-84 years with an average age of 54.2 ± 16.4 years. Females were 56.6 % (85 patients) and males 43.3 % (65 patients). Serum B12 concentrations were quantified by chemiluminescent enzyme immunoassay. Vitamin B12 deficiency was considered if the blood level was below 200 pg/ml and borderline-low B12 (≤ 300 pg/ml) and if they were on metformin treatment for more than a year.

Results: The average level of Vitamin B12 in all patients was 337.1 ± 155.5 pg/ml. About 16.1 % (24 patients) had vitamin B12 deficiency with an average level of 145.3 ± 30.4 pg/m; and 48.4 % (73 patients) had a borderline-low level with an average level of 214 ± 56.9 pg/ml. In the group of patients with DM type 2 who were under treatment with metformin, the average levels of vitamin b12 were lower (264 pg/ml) compared to the group without metformin (409 pg/ml) ($p = 0.06$). 21.5 % of patients with diabetes under treatment with metformin were deficient in vitamins B12 (< 200 pg/ml) compared to 4 % of patients without diabetes.

Conclusion: Metformin could be a major risk factor for Vitamin B12 deficiency. Routine testing of Vitamin B12 levels should be taken into consideration by clinicians.

P 29

A complex investigation of the metabolic abnormalities correlated with obesity

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Introduction: Obesity is a chronic condition with increasing incidence, accompanied by various metabolic changes that consequently amplify the risk of association of numerous disorders, especially diabetes and cardiovascular disease.

Aims: Our study is focused on the assessment of metabolic changes in lipid profile, insulin resistance and chronic inflammation of the obese patients compared to healthy-weight individuals.

Methods: We selected 410 patients for our observational retrospective study, of which 295 met the exclusion criteria (people diagnosed with T2DM, tumours, HF, ALF, ARF), but only 78 people presented enough data. They were divided into two groups, based on their body mass index (BMI). Group A included 41 obese patients, with a mean age of 52.21 ± 11.94 years, and Group B consisted of 37 normal weight patients with a mean age of 50.45 ± 11.67 years. We analysed patients age, BMI, total cholesterol, LDL-C, triglycerides (TG),

c-reactive protein (CRP) and C-peptide. The data analysis was performed using Microsoft Excel®.

Results: Group A presented increased levels of total cholesterol compared to group B (5.45 ± 1.34 mmol/l vs 4.58 ± 1.48 mmol/l, p <0.01). LDL-C values were higher in group A (3.6 ± 1.06 mmol/l vs 2.7 ± 0.97 mmol/l, p <0.001). A similar tendency was observed in TG levels for group A (2.05 ± 0.87 mmol/l vs 1.16 ± 0.29 mmol/l, p <0,01). CRP levels were 2.7 times higher in group A, compared to group B (7.38 ± 5.05 mg/l vs 2.74 ± 1.55 mg/l, p <0.05). C peptide values were also 2.5 times higher in group A, compared to group B (4.43 ± 1.36 ng/ml vs 1.73 ± 0.5 ng/ml, p <0.001).

Conclusions: The results of our study showed higher values of total cholesterol, LDL-C and TGC, along with the presence of chronic inflammation and insulin resistance in obese people.

P 30

Real-life Data about the Safety of New Antidiabetic Drugs (Sodium-Glucose Cotransporter-2 Inhibitors and Glucagon-Like Peptide 1 Receptor Agonists)

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Background: Type 2 Diabetes Mellitus (T2DM) represent a part of the chronic non-transmittable diseases' pandemics. Polypharmacy is a problem for clinicians nowadays in terms of drug-drug interactions. Aim: To evaluate the safety using Sodium-glucose Cotransporter-2 Inhibitors (SGLT2i) and Glucagon-like Peptide 1 Receptor Agonists (GLP-1 RAs) drugs when are in prescription with high blood pressure (HBP), lipid-lowering and other glucose-lowering drugs for the treatment of T2DM in a standard of care regimen with maximum tolerated doses.

Methods: A retrospective, observational study on 295 patients from the outpatient clinic of N Paulescu National Institute for Diabetes Mellitus, Bucharest, Romania, in 2019. Demographic, metabolic and treatment parameters were evaluated at three follow-up visits from baseline, six months and twelve months.

Results: Both SGLT-2i and GLP-1 RAs are safe regarding creatinine, eGFR, urea, GOT and GPT when comparing the data from six- and twelve-month visits with the baseline visit and also the twelve months visit with the six months visit. On the other hand, when comparing SGLT-2i and GLP-1 RAs with metformin, the safety data are encountered only for urea.

Conclusions: Both SGLT-2i and GLP-1 Ras are safe for T2DM management when used in conjunction with other glucose-lowering, blood pressure-lowering, and lipid-lowering medications.

Keywords: antidiabetic drugs; safety; GLP-1 RAs; SGLT-2i; metformin

P 31

Treatment of type 2 diabetes in clinical practice: are therapeutic targets met?

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Background: For most patients with type 2 diabetes mellitus (T2DM), an integrated approach to risk factor management is needed to help reduce the risk of cardiovascular events.

AIMS: The aim of our work was to assess the achievement of recommended therapeutic targets for glycated haemoglobin (HbA_{1c}), LDL cholesterol (LDL-C) and blood pressure (BP) in a real-life sample of patients with T2DM.

Patients and methods: The study group included 640 consecutive patients with T2DM (55 % women) who presented at the Diabetes Centre for the regular check-up, during a 3-month period (May – July 2022). Baseline characteristics, therapeutic regimens and treatment success – defined as the achievement of a BP of 130/80 mmHg or lower, HbA_{1c} of 7 % or lower, LDL-C lower than 70 mg/dl – were reported. Data were analyzed using SPSS v.20 (SPSS Inc. Chicago, IL) statistical software suite.

Results: The HbA_{1c} target of 7 % or lower was attained by 43 % of patients. Of the 365 patients (57 %) who did not achieve target HbA_{1c} levels, 18 (4.9 %) were not receiving any antihyperglycemic agent, while an additional 89 (24.3 %) were receiving monotherapy. 67.1 % of patients with hypercholesterolemia were treated with lipid-lowering agents. Overall, 17.8 % met the target for LDL-C. Lipid-lowering agents were not prescribed to 28 % of patients with LDL-C above target. Overall, 60 % of individuals had a BP that was above the recommended target. Of these, 23.4 % were untreated, 43.7 % were receiving monotherapy and 6 % received neither an angiotensin-converting enzyme inhibitor nor an angiotensin receptor blocker. In total, 25 % of patients achieved the combined targets for BP, HbA_{1c} and LDL-C.

Conclusions: Despite well-established therapeutic goals and various treatment options currently available, the combined targets for BP, HbA_{1c} and LDL-C do not reach the values recommended by international guidelines.

P 32

Similar HbA_{1c} reduction with GLP1RA and SGLT2i treatment intensification strategy in type 2 diabetes patients – a prospective study in ambulatory clinics

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Introduction: Both sodium-glucose cotransporter-2 inhibitors (SGLT2i) and a glucagon-like peptide-1 receptor agonist (GLP1RA) were proven to be safe and effective in patients with inadequately controlled type 2 diabetes (T2DM). Although their combined use is encouraged, most often clinicians have to choose one of the cardiorenal protective classes first.

We aimed to compare the weight and HbA_{1c} differences in patients with T2DM that are initiated on SGLT2i or GLP1RA.

Materials and methods: We conducted an observational, prospective study, lasting 6 months (January 2022- June 2022) and enrolled all patients with T2DM that presented in two outpatient clinics in Bucharest. HbA_{1c} and weight were measured at initiation and after 6 months. Mann-Whitney U test and student t-test (SPSS® version 20) were used, with a p-value of 0.05 set for significance.

Results: Seventy patients met the inclusion criteria, of whom 51.43 % were males from urban areas (88.57 %). The mean age was 59.06 ± 10.14 years with a mean duration of diabetes of 6.94 ± 6.07 years. Twenty-two patients were initiated on GLP1RA (Group1) and 48 patients on SGLT2i (Group2). In both groups, there was a significant decrease in HbA_{1c} at 6 months (7.81 % vs 7.06 % for Group1, and 8.03 % vs 7.06 % for Group2). When we compared the median HbA_{1c} decrease, there was no significant difference between groups (0.7 % vs 0.5 %, p = 0.198), but the mean weight decrease was significantly higher in Group 1 (5 kg vs 1.6 kg, p = 0.028).

Conclusion: In our cohort, there was a similar reduction of HbA_{1c} in groups initiated on GLP1RA versus SGLT2i treatment and a significantly higher weight reduction for the GLP1RA.

P 33

Monoamine Oxidase (MAO) Contribution to Vascular Hyperglycemic Memory – Are MAO Inhibitors Candidates for Drug Repurposing?

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Background: Recently, it has been discovered that the mitochondrial enzymes monoamine oxidase (MAOs, A and B), which are responsible for catecholamines metabolism, while continuously producing reactive oxygen species (ROS), are involved in cardio-metabolic diseases. The current investigation aimed to determine whether MAOs, in addition to their functions in inducing oxidative stress and endothelial dysfunction in diabetes mellitus (DM), contributed to the "hyperglycemic or metabolic memory" phenomena even after blood glucose levels were normalized.

Materials and methods: Mice with streptozotocin-induced DM (treated or not with insulin – glargine, and MAO inhibitors) were sacrified after 2 weeks of hyperglycemia and aortas were harvested for the evaluation of: vasomotor function (organ bath), oxidative stress (dihydroethidium staining and ferrous oxidation xylenol orange) and MAO expression (qRT-PCR and immune-histochemistry).

Results: Results showed that MAOs expression was increased in diabetic mice aortas after 2 weeks of hyperglycemia together with high ROS production and impaired vascular relaxation. Partial glucose normalization with glargine (10 U/kg/day, 1 week) failed to significantly reduce ROS generation and normalize vascular relaxation. In vivo co-administration of MAO inhibitors (clorgyline and selegiline, 1 mg/kg/day, 1 week) on the top of insulin additively mitigated the oxidative stress and alleviated endothelial dysfunction in diabetic mice.

In conclusion, in the mice model of type 1 diabetes, MAO inhibitors blunted the vascular "hyperglycemic memory" and appear to be viable candidates for drug repurposing as vasculo-protective agents in diabetes.

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P 34

The economic impact of obesity in 4 selected South-Eastern European countries: healthcare resource use and costs associated with obesity-related complications

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Background: Overweight and obesity have been linked to a host of non-communicable diseases that incur incremental health and economic burden for individuals and society. Nearly one in three of the South-Eastern European (SEE) population have obesity while at least 60 % have either overweight or obesity. The lack of local evidence on both clinical and economic burden of obesity will need to be addressed for governments in the region to develop health promotion policy initiatives that expediently address the growing epidemic.

Method: A micro-costing approach from the public payer's perspective was used to estimate direct healthcare costs associated with 10 obesity-related comorbidities (ORCs) in 4 SEE countries, Czech Republic, Greece, Hungary, and Romania. In each country, experienced clinicians working in the public health sector were asked to estimate healthcare resource use (HCRU) associated with each ORC, while experienced public hospital administrators were asked to estimate healthcare unit costs. The overall annual cost per patient per ORC was estimated by summing all cost items within each ORC cost category.

Results: Chronic kidney disease (CKD) and cardiovascular diseases (CVD) were generally the costliest ORCs across all 4 countries, where annual cost burden per ORC exceeded 1500 USD per patient per year. Individuals with any single ORC incurred direct healthcare costs ranging from 979 – 3,684 USD in Hungary to 1,540 – 16,258 USD in Greece annually. Overall costs were primarily driven by the tertiary care resources allocated to address treatment-related adverse events, treat disease complications and the associated inpatient procedures. Hypertension, asthma, and hyperlipidemia were the least costly ORCs, incurring approximately one-tenth to one-third of the costs of the costliest complications. The cost differences can be attributed to the reduced severity of adverse events and complications that arise from these conditions, which are often managed at the primary care level.

Conclusion: To our knowledge, this is the first study to evaluate costs collectively and comprehensively and HCRU associated with managing ORCs in respective countries at an average individual patient level. Estimating and comparing ORCs costs incurred by the public payer in the 4 SEE countries is challenging given the variations in healthcare practices, health systems and financing systems. Our findings address an evidence gap, and further confirm that the high prevalence of obesity and its complications result in significant financial burden to all 4 SEE public payers. Immense cost savings can be achieved by preventing or delaying the occurrence of obesity. By quantifying the burden of obesity on health from a public healthcare perspective, our study

aims to support policy efforts that promote health education and promotion in combating obesity in the region.

P 35

Nutritional management challenges in a patient with gastric cancer and type 2 diabetes

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Introduction: Gastric cancer was the fifth most prevalent form of cancer in 2020, with over one million new cases diagnosed. Globally, gastric cancer is the fourth leading cause of cancer-related fatalities, and it is anticipated that by 2040 there will be 62 % more cases and 1.27 million deaths.

Objective: This case report describes a 69-year-old Caucasian female with gastric cancer, peritoneal carcinomatosis, type 2 diabetes, class I obesity, and stage 1 hypertension. It emphasizes the importance of nutritional intervention in gastric neoplasm.

Case Presentation: The patient was referred to the clinic to improve her nutritional status before undergoing chemotherapy. During the initial visit, the multidisciplinary medical team assessed the nutritional status, the malnutrition risk, using the SGA screening tool, and initiated nutritional recommendations. Despite the fact that our patient's BMI indicated class I obesity, she was moderately malnourished as a consequence of poor diet and weight loss.

The challenges in this case derived from the patient's feeding difficulties, which included loss of appetite, dysphagia, a reduced amount of food delivered via the jejunostomy, and changes in intestinal transit at a high rate of bolus delivery.

The registered dietitian formulated the nutritional plan, selected the formula for enteral nutrition with a special indication for diabetic patients, and provided samples of blended meals for jejunostomy feeding in order to provide nutrient requirements. In Romania, nutritional supplements for jejunostomy are not reimbursed, and their cost frequently impedes nutritional management of malignant conditions. Unfortunately, the patient was referred to a dietician late in the course of the disease, which diminished the benefit.

The patient died after two months, despite the best efforts of the medical staff, due to metastases, dietary difficulties, and consequent malnutrition.

Discussion: This case illustrates the importance of a multidisciplinary medical team and standardized procedures in providing quality care to patients with gastric cancer. To achieve the desirable results, patients with malignancies must be referred promptly to nutrition services.

P 36

Neutrophil-to-lymphocyte ratio – a reliable marker for prediction of Diabetes Macrovascular complications

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Background: Neutrophil-to-lymphocyte ratio (NLR) reflects the tight relationship between innate-neutrophils, and adaptive cellular immune response-lymphocytes, during illness and various pathological states. NLR is influenced by many conditions, including age, medication, and chronic disease (diabetes, coronary heart disease, stroke, obesity, cancer, anaemia, and stress). For adults, a normal range of NLR is between 1–2; values higher than 3.0 are pathological. Therefore, NLR between 2.3–3.0 may serve as an early marker of pathological states like inflammation, cancer, atherosclerosis, infection, psychiatric disorders and stress. Clinical research confirmed the sensitivity of NLR for diagnosis and stratification of systemic infection, sepsis, and bacteremia, as well as its strong predictive and prognostic value. Therefore, NLR should be investigated daily and followed up to its dynamic course in an acute disease or critical illness. The severity of illness and inflammation is expressed by the dramatic increase of NLR values above 11 or even higher than 30.

Aim of the Study: Studies investigating the associations of the NLR with diabetic complications, including cardiovascular disease (CVD), chronic kidney disease (CKD) and amputation, were limited, so our study aims to evaluate the associations between the NLR level and the prevalence of vascular complications in adults with diabetes.

Material and Methods: Between 1st January 2022 and 16th April 2023, we evaluated 2269 patients with T2DM hospitalized at The Romanian National Institute of Diabetes, Nutrition, and Metabolic Diseases. After obtaining the informed consent, clinical and paraclinical data were collected. Complete blood count, erythrocyte sedimentation rate (ESR), renal function parameters, Doppler tests for diabetic foot and carotid ultrasound were done. From the studied group, 781 patients presented changes in NLR, with abnormal NLR (<0.7 or > 3.00). The data were analyzed them using SPSS software 20.0.1.0(171).

Results and Discussions: The group's characteristics were: 53.9 % male, with a mean age of 61.82 ± 14.98 years, 34.4 % of whom had abnormal NLR. Of 2269 patients with T2DM, the mean NLR was 2.38 ± 1.75, 48.0 % had CVD, 33.3 % had CKD, and 7.5 % had a diabetic amputation. We subdivided the patients by NLR into two groups (normal and abnormal values of NLR), and it was observed a statistically significant association between abnormal values of NLR and diabetes complications Myocardial Infraction $p < 0.01$, Stroke $p < 0{,}013$, Atrial fibrillation $p < 0{,}01$, Coronary heart disease $p = 0.014$), except diabetic neuropathy and retinopathy.

Conclusion: T2DM patients with higher NLR may be more likely to develop diabetes-related chronic complications, especially macrovascular. Therefore, NLR, which is easy to perform and inexpensive, may serve as a predictive marker for these complications, enabling early detection and prompt treatment. Further research with a prospective design and multiple NLR measurements will shed more light on the role of NLR as a marker of chronic complications of diabetes.

Keywords: Neutrophil-to-lymphocyte ratio; type 2 Diabetes Mellitus, Diabetic peripheral neuropathy (DPN); Diabetic retinopathy; CVD: cardiovascular disease; Inflammation; non-invasive marker; anti-diabetic medication.

P 37

Prevalence and Determinants of Hyperuricemia in Type 2 Diabetes Mellitus Patients

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Background: Hyperuricemia has been associated with various chronic conditions such as Type 2 Diabetes Mellitus (T2DM), metabolic syndrome (MS), obesity, hypertension (HTN) or chronic kidney disease (CKD). Uric acid (UA) is the end product of purine catabolism. Hyperuricemia is an increase in serum UA caused by increased production or decreased excretion of UA, and also a combination of both.

Aim of the Study: This study aims to evaluate the prevalence of hyperuricemia in T2DM patients, associated risk factors and comorbidities.

Material and Method: In this cross-sectional study, we included data from 2540 patients with T2DM admitted to The National Institute of Diabetes, Nutrition and Metabolic Diseases „N. Paulescu" from the 1st January 2022 to the 16th April 2023. Clinical and paraclinical data were collected from patients' observation charts after they signed the informed consent.

Results: The group's characteristics were: a proportion of 56.64 % male, with a mean age of 62.54 ± 14.04 years, 25.68 % of whom had hyperuricemia. Mean UA values were: 5.17 (3.56 – 7.27) mg/dl. Patients with hyperuricemia versus those without this condition had higher values regarding age, BMI, and mean duration of T2DM. Also, patients with hyperuricemia had a higher prevalence of CKD (57.90 % vs 38.52 %, $p < 0.01$ hypertension (HTN) (66.18 % vs 30.38 %, $p < 0.01$), and heart failure (HF) (54.63 % vs 38.71 %, $p < 0.01$) compared to those without hyperuricemia.

Conclusion: Hyperuricemia was found in almost a quarter of patients with T2DM enrolled in our study. The prevalence of hyperuricemia was higher in patients with HTN, longer duration of DM, higher BMI and lower eGFR. More emphasis should be put on the awareness of lifestyle modification and early diagnosis of hyperuricemia in T2DM patients, given its association with other cardiovascular risk factors and the importance of strict concomitant treatment for the associated conditions.

Keywords: hyperuricemia, type 2 diabetes mellitus, cardiovascular risk factors.

P 38

Surgical treatment for septic lesions of the diabetic foot

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Introduction: Diabetic foot is a complication of patients affected by diabetes mellitus, this pathology encompassing all the changes occurring in the lower limb determined by poor blood sugar control, peripheral arterial disease, respectively neuropathy. Surgical treatment is in most cases the central stage in the management of the diabetic foot, in the form of limited interventions or through major amputations depending on the lesions encountered.

Method: The current study is a retrospective one, carried out between January 1, 2020 and December 31, 2021, which included 299 diabetic patients hospitalized in the General Surgery Department of the Dr. I. Cantacuzino Clinical Hospital.

Results: Patients treated with insulin had better glycemic control compared to those who were treated with oral antidiabetics (20.3 % vs. 16.3 %). Peripheral arterial disease was present in 90.6 % of cases, while diabetic neuropathy affected 27.1 % of cases. The most common lesion was wet gangrene (59.9 %) followed by ischemic necrosis. (19.7 %)

Discussions: Men are more prone to diabetic complications than women, something that can be explained by adopting a different lifestyle, or differences from a hormonal point of view. The age range with the highest prevalence of diabetic foot is between 50 and 79 years, which is also confirmed by the literature. Another important factor in the development of diabetes complications is the period from diagnosis, patients who were diagnosed with diabetes for more than 10 years had a higher rate of complications.

Conclusions: In the development of diabetic foot pathology, both neuropathy and peripheral arterial disease appear in varying degrees. Poor long-term glycemic control leads to an advanced degree of lesions, while insulin treatment has proven more effective than oral antidiabetics in maintaining glycemic values in a normal range. The most frequently encountered pathological conditions are those of wet gangrene followed by ischemic necrosis, these two causing the majority of major amputation interventions.

Key-words: diabetes mellitus, surgery, diabetic foot, amputation, glycemia

P 39

The combination of an SGLT2 inhibitor with finerenone – what do we know so far?

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Background: Despite recent developments in therapeutic strategies that limit diabetic kidney disease (DKD) progression, with a main focus on the role of sodium glucose cotransporter-2 inhibitors (SGLT2i), added to an optimized renin-angiotensin system blockade, there is still a residual cardiorenal morbidity and mortality risk. Finerenone is a selective, nonsteroidal mineralocorticoid receptor antagonist (MRA) that was included in recent guidelines as recommended treatment for adults with chronic kidney disease (CKD) and type 2 diabetes mellitus (T2DM).

Aim: The aim of this review is to address the observation that the combination of an SGLT2i with finerenone may improve renal and cardiovascular outcomes.

Methods: A review of the literature was performed in March 2023 using MEDLINE and Web of Science databases and included one randomized controlled trial (RCT), one observational study and a pooled data analysis from two RCT.

Results: The FIDELITY analysis of the FIDELIO and FIGARO trials showed beneficial effects of finerenone on kidney and cardiovascular outcomes across a broad spectrum of patients with CKD and T2DM, and the cardiorenal

benefits were observed irrespective of SGLT2i use. The CONFIDENCE trial is the first RCT to evaluate the efficacy and safety of dual use of finerenone and an SGLT2i in adults with CKD and T2DM, with an estimated study completion date in June 2024. The FLAMINGO observational study has an estimated enrollment of 30000 participants with T2DM and CKD treated with an SGLT2i alone or in combination with finerenone - estimated completion in November 2023.

Conclusion: With the development of novel agents and ongoing clinical trials regarding the management of DKD, better personalized therapeutic strategies are needed to improve renal and cardiovascular outcomes.

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The Prevalence of Chronic Diseases among Patient with Type Two Diabetes Mellitus in King Abdulaziz National Guard Hospital AlAhasa

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Background: Diabetes mellitus is the most common endocrine disorders encountered in clinical practice. Many chronic diseases like Hyper- and hypothyroidism, Hypertension, Dyslipidemia and Obesity have been associated with insulin resistance, which has been reported to be the major cause of impaired glucose metabolism in type II DM.

Aims: The main aim of this study to investigate the prevalence of chronic diseases among patient with type two diabetes mellitus in National Guard hospital, AlHasa.

Patients and Methods: A retrospective cross-sectional study was done on patients who diagnosed with type II DM and regularly attended the family medicine clinic at National Guard hospital, AlHasa, Saudi Arabia.

Results: Out of 300 randomly selected type two diabetic patients with different chronic diseases. In addition, there was a statistically significant association between HbA_{1c} level and type of treatment received by our population but fasting blood glucose level was not significant. Regarding the TSH level, out of 300 patients; 9.5 % were diagnosed normal and 90.5 % were diagnosed abnormal regarding to the TSH level. One hundred thirty-five patients had hypertension with Dyslipidemia and the rest of the patients had another co morbidities. Vitamin D level deficiency was observed in the majority of patients and insufficiency in of patients.

Conclusion: In our population, the prevalence of female diabetic patients with chronic diseases was 1.8 times higher than diabetic male. The prevalence of abnormal diagnosed level of TSH was 9.5 times higher than normal level.

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The current therapeutic approach in charcot osteoarthropathy

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Introduction: Charcot osteoarthropathy is a complex pathological condition, which involves a disorganization of the joints and the bone skeleton of the foot, with an incompletely elucidated pathogenesis, but closely related to peripheral neuropathy, present especially in diabetic patients. The progressive destruction and inflammation of the tissues are favored by poor glycemic control and the late diagnosis of the disease, which is why the therapeutic management is multidisciplinary with the initiation of treatment at an early stage.

Method: In this study, we propose to make a detailed analysis of the etiologies of Charcot Osteoarthropathy and the current therapeutic solutions for this pathology, both those using pharmacological treatment and those that include reconstructive surgery or amputations.

Results: The pathophysiological mechanism involved in the occurrence of bone lesions is represented by the cytokines TNF-α and IL-1β that stimulates the RANKL / OPG system, which in turn activates pre-osteoclasts, thus inducing bone resorption. The first stage of the treatment involves mechanical protection of the leg through immobilization, followed by pharmacotherapy using bisphosphonates, respectively calcitonin. In cases complicated with fractures, there will be performed orthopedic surgical interventions such as arthrodesis, while in case of major bone deformations, osteotomies and subsequent reconstructions are indicated. Septic complications require amputation interventions or extensive debridement.

Discussions: Immobilizing the leg, protecting it from the possibility of other injuries, is an important objective in the management of the Charcot osteoarthropathy. The treatment algorithm primarily involves the administration of anti-inflammatory drugs, as well as the control of diabetes through insulin therapy or oral antidiabetics. Surgical treatment is represented by reconstructive orthopedic interventions or, in the case of an advanced degree of disability or septic complications, amputations.

Conclusions: Although major progress has been made in the understanding of Charcot Osteoarthropathy, additional studies are still needed to clarify the etiological and pathophysiological mechanisms, to facilitate diagnostic methods at an early stage and to discover new therapeutic resources.

Key-words: neuropathy, Diabetes Mellitus, Charcot Osteoarthropathy, surgical treatment, amputation

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Finerenone in chronic kidney disease and type 2 diabetes – old and new

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Background: Finerenone is a selective, nonsteroidal mineralocorticoid receptor antagonist that was included in recent guidelines as recommended treatment for adults with type 2 diabetes (T2D) and chronic kidney disease (CKD), with proven renal and cardiovascular benefits.

Aim: In addition to reviewing the clinical evidence for the use of finerenone in CKD associated to T2D, we aim to address the possible synergistic effects of finerenone and sodium-glucose cotransporter-2 inhibitors (SGLT2i) in this population.

Methods: A review of the literature was performed from inception until March 2023 using PubMed, Embase, Cochrane Library databases and included four completed randomized controlled trials (RCT) that investigated

finerenone versus placebo in patients with CKD and T2D with cardiorenal endpoints. The ongoing clinical trials were searched in the ClinicalTrials.gov database and included one RCT and one observational study that investigate the combination of finerenone and an SGLT2i in T2D patients with CKD.

Results: ARTS-DN studied finerenone therapy in patients with T2D and diabetic kidney disease, with improvement in urinary albumine-creatinine ratio. ARTS-DN Japan reported similar results. The FIDELIO and FIGARO had a complementary design and demonstrated beneficial effects of finerenone on kidney and cardiovascular outcomes across a broad spectrum of patients with CKD and T2D, with a favorable safety profile. The FIDELITY pooled analysis from the FIDELIO and FIGARO trials observed cardiorenal benefits irrespective of SGLT2i use. Two ongoing clinical trials are evaluating the dual use of finerenone and an SGLT2i in adults with CKD and T2D – the CONFIDENCE RCT and the FLAMINGO observational study.

Conclusion: Finerenone demonstrated efficacy and safety across a range of cardiorenal outcomes in patients with CKD and T2D and studies of the combination of finerenone with an SGLT2i are underway.

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Effect of Adherence to Therapy and Health Plans in Achieving Diabetes Control Among Diabetic People at King Abdulaziz National Guard Hospital AlAhsa : Retrospective Study

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Background: Diabetes mellitus is the most common chronic endocrine disorder and results in significant complication.

Aims: To assess effect of adherence to therapy and health plans in achieving diabetes control among diabetic people at King Abdulaziz National Guard Hospital, AlAhsa.

Patients and Methods: A retrospective study was conducted among diabetic patients attending outpatient clinic. Patients were identified through the hospital medical records, over a one year period. The estimated population size around 2000 patients, and 322 patients were selected by a systematic sampling method. Medical charts were reviewed, the data were collected in a specially designed data sheet: and entered in a computer, and finally analyzed using a SPSS program.

Results: About 90 % of patients were older than 40 years old and 92.2 % were overweight or obese. The overall glycemic control as evaluated by HgA_{1C} was acceptable in about 22.4 % of the patients. More than half of patients were on diet and oral hypoglycemic therapy and 94.7 % were taking more than 3 drugs. About 44.7 % of patients had hypertension and hyperlipidemia. The frequency of monitoring HgA_{1C} level within one year was three times in the majority of patients. About 69.3 % of patients had regular attendance to clinic and 87.6 % had regular refill medication. There were statically significant relation between diabetic controlled and patient age, frequency of monitors HgA_{1C}, type of therapy and number of drugs taken (P-Value <0.05).

Conclusions: The findings of this study among our diabetic patient led us to conclude that the control of diabetes and adherence to health recommendations are suboptimal.