CEDA diabetes
Zentraleuropäische Diabetesgesellschaft
Central European Diabetes Association
Föderation der Internationalen Donau-Symposia über Diabetes mellitus
Federation of International Danube-Symposia on Diabetes mellitus

Abstracts (Part 1) from the Congress of the Central European Diabetes Association (CEDA), June 6–8, 2024 in Palermo (Italy)

The 2024 CEDA Annual Congress was organized by Prof. Manfredi Rizzo in Palermo, Italy. There were more than 400 attendees coming from 36 countries, namely from Europe, North Africa, the Middle East and the USA.
There were 8 joint symposia in collaboration with various scientific societies, including EASD and ESC, as well as 15 scientific sessions, 6 plenary lectures, 1 lunch workshop, 8 sponsored symposia and 9 sessions with oral presentations. All accepted abstracts will be published in this and the next issue of Diabetes, Stoffwechsel und Herz.

OC01

Comparison of the metabolic carts Vyntus CPX and Vmax Encore 29N

N. Trinks[1], J. Pützer-Furmanczak[1], O. Kuss[2], A. Sutkowski[1], V. Burkart[1], M. Roden[1] | [1]Institute for Clinical Diabetology, German Diabetes Center, Leibniz Institute for Diabetes Research at Heinrich Heine University, Düsseldorf, Germany | [2]Institute for Biometrics and Epidemiology, German Diabetes Center, Leibniz Institute for Diabetes Research at Heinrich Heine University, Düsseldorf, Germany

Background: Resting energy expenditure (REE) and respiratory quotient (RQ) are important parameters for assessing whole-body energy metabolism. Given that the widely used metabolic cart, Vmax Encore 29N, is no longer in production, there is an urgent need for a suitable replacement. This study aims to investigate the reliability of the successor model Vyntus CPX. Methods: Five participants with type 2 diabetes (2 females, 3 males), enrolled in the prospective longitudinal German Diabetes Study (GDS), underwent four indirect calorimetry measurements per day over four consecutive days. Each day included two measurements with both devices, Vmax Encore 29N (Höchberg, Germany) and Vyntus CPX (Höchberg, Germany), in randomized order. Post-calorimetric calibration with normalization was performed subsequently after each measurement.

Results: Coefficients of variation indicated minor differences in carbon dioxide production (VCO2) [3.5% vs. 5.3%, (95% CI for difference -8.2, 8.0)], oxygen consumption (VO2) [3.4% vs. 5.7%, (95% CI for difference -9.3, 8.2)], RQ [3.6% vs. 2.3%, (95% CI for difference -3.5, 3.7)] and REE [3.1% vs. 5.6%, (95% CI for difference -8.4, 7.8)] between Vmax Encore 29N and Vyntus CPX. Post-calorimetric calibration neither improved measurements of RQ and REE when using Vmax Encore 29N [RQ: 0.6% (95% CI for difference -2.9, 3.1); REE: 0.7% (95% CI for difference -5.7, 6.2)] nor when using Vyntus CPX [RQ: -0.1% (95% CI for difference -2.4, 2.3); REE: 0.2% (95% CI for difference -6.1, 6.5)].

Conclusions: The Vyntus CPX offers reliable measurements of the parameters of whole-body energy metabolism, which are comparable to that obtained by Vmax Encore 29N and avoid previously used post-calorimetric calibration.

OC02

Peripheral neuropathy unveiled: Exploring its incidence in pre-diabetes and beyond. Data from Northwest Greece

G. Anastasiou[1], F. Barkas[1], N. Papanas[2], N. Tentolouris[3], G. Liamis[1], A. Bechlioulis[4], L., Michalis[4], E. Liberopoulos[3] | [1]Department of Internal Medicine,

Faculty of Medicine, School of Health Sciences, University of Ioannina, Greece | [2]Diabetes Centre, Second Department of Internal Medicine, Democritus University of Thrace, Alexandroupolis, Greece | [3]First Department of Propaedeutic and Internal Medicine, Medical School, National and Kapodistrian University of Athens, Laiko General Hospital, Athens, Greece | [4]Second Department of Cardiology, Faculty of Medicine, School of Health Sciences, University of Ioannina and University Hospital of Ioannina, Greece

Objective: To scrutinize the incidence of distal sensory peripheral neuropathy (DSPN) among individuals diagnosed with prediabetes.

Methodology: A prospective observational study was conducted at a University Hospital Clinic in Greece, enrolling patients diagnosed with prediabetes. Exclusion criteria involved screening for secondary causes of DSPN. DSPN dia-gnosis was established using a combination of criteria: Neuropathy Symptom Score (NSS) ≥ 5 plus Neuropathy Disability Score (NDS) ≥ 3, or NDS ≥ 6, or abnormal vibration perception threshold (VTP) plus NSS ≥ 3 plus NDS ≥ 3. Additional parameters such as ankle brachial index (ABI), arterial stiffness evaluated through aortic pulse wave velocity (PWV), medical history, and laboratory findings, including albuminuria defined by albumin-creatinine ratio (ACR) ≥ 30 mg/g, were recorded. Patients with confirmed DSPN at the initial visit were excluded from subsequent analysis, and only those completing the follow-up were included.

Results: A total of 131 individuals diagnosed with prediabetes were enrolled, with a median age of 63 years and 57.4% being males. Over a median follow-up period of 14 months (interquartile range: 12-26 months), 28 patients (21.4%) developed DSPN. Univariate regression analysis revealed significant associations between the development of DSPN and Homeostasis Model Assessment-Insulin Resistance (HOMA-IR) (HR = 1.20, 95% CI: 1.01-1.45, p = 0.04), albuminuria (HR = 1.02, 95% CI: 1.01-1.03, p = 0.04), PWV (HR = 2.92, 95% CI: 1.49-5.71, p = 0.002), and ABI (HR = 3.54, 95% CI: 2.66-18.75, p = 0.04) (Table). Multivariate regression analysis identified PWV as independently associated with incident DSPN (HR = 2.75, 95% CI: 1.07-7.04, p = 0.04).

Conclusion: Among individuals diagnosed with prediabetes, a substantial proportion (21.4%) developed DSPN during a median follow-up period of 14 months. Increased levels of HOMA-IR index, PWV, ABI, and the presence of albuminuria were associated with a heigh-tened risk of developing DSPN in this cohort. Notably, among these factors, PWV emerged as significantly and independently correlated with incident DSPN.

OC03

Hypertriglyceridemia treatment using PCSK9 inhibitors in very high cardiovascular risk patients with type 2 diabetes

M. Lapsovs[1], K. Lapsova[2], K. Trusinskis[3], I. Konrade[4], L. Caunite[1], E. Knoka[1], M. Karantajere[1], A. Erglis[1] | [1]Latvian Centre of Cardiology, Pauls Stradiņš Clinical University Hospital Riga, Latvia | [2]Rīga Stradiņš University Riga, Latvia | [3]Latvian Centre of Cardiology, Pauls Stradiņš Clinical University Hospital Riga, Latvia | [4]Riga East University Hospital Riga, Latvia

Objectives: Type 2 diabetes mellitus (T2DM) with hypertriglyceridemia is an independent risk factor for major adverse cardiovascular events. Intensive lipid-lowering therapy including PCSK9 inhibition is recommended for dyslipidemia treatment. The aim of this study was to evaluate PCSK9 inhibitor add-on treatment effects on LDL-C and triglycerides.

Methods: Twenty patients with LDL-C levels above 3.0 mmol/L on a maximum tolerated dose of a statin and ezetimibe were assigned for PCSK9 inhibitor therapy with alirocumab. All patients had T2DM, a very high cardiovascular risk, and percutaneous coronary intervention. Follow-up (FU) visits were done at 1, 3, and 12 months after the first injection of PCSK9 inhibitor with alirocumab. Statistical analysis was carried out with SPSS statistics software, defining a significance level of 0.05.

Results: The baseline LDL-C level was 4.02 mmol/L and TG 2.83 mmol/L. After the first FU, mean LDL-C decreased by 68.4% and was 1.27 mmol/L (p<0.001) and triglyceride (TG) lowered by 38.5% from 2.83 mmol/L to 1.74 mmol/L (p = 0.003). After the second FU, mean LDL-C was lower by 58%, being 1.65 mmol/L (p = 0.001), and TG declined by 33.5% with 1.88 mmol/L (p = 0.005). After 12 months, mean LDL-C levels were lower by 61.4% and reached 1.55 mmol/L (p = 0.012), and TG showed 31.8% reduction and were 1.93 mmol/L (p = 0.033).

Conclusions: The addition of PCSK9 inhibitor to lipid-lowering treatment significantly reduced LDL-C and TG levels at the first month of follow-up by 68.4% and 38.5%, respectively with statistically significant reduction during all follow-ups.

OC04

Markers of mitochondrial dysfunction and insulin resistance in overweight and obese children and adolescents

J. Šikonja[1], M. Filipič[2], K. Klemen[2], B. Repič Lampret[3], J. Kovač[4], T. Battelino[5], P. Kotnik5, U. Grošelj[5] | [1]Department of Endocrinology, Diabetes and Metabolic Diseases, University Medical Center Ljubljana; Faculty of Medicine, University of Ljubljana, Slovenia | [2]Faculty of Medicine, University of Ljubljana, Slovenia | [3]Clinical Institute of Special Laboratory Diagnostics, University Children's Hospital, University Medical Centre Ljubljana, Slovenia | [4]Faculty of Medicine, University of Ljubljana; Clinical Institute of Special Laboratory Diagnostics, University Children's Hospital, University Medical Centre Ljubljana, Slovenia | [5]Faculty of Medicine, University of Ljubljana; Department of Endocrinology, Diabetes and Metabolism, University Children's Hospital, University Medical Centre Ljubljana, Slovenia

Insulin resistance (IR) is associated with mitochondrial dysfunction (MD), however the associations of individual MD markers with IR are not well established, particularly in children. Thus, we aimed to identify MD markers associated with IR in the pediatric population and examine their associations with indirect indicators of IR.

75 overweight children (average age 13.73 ± 2.65 years, 54.7 % female, BMI z-score 2.84 ± 0.65) underwent a modified oral glucose tolerance test (mOGTT). Firstly, we investigated the correlation of established IR indexes (HOMA-IR, QUICKI, SPISE, ISI-M) with 7 indirect indicators of IR: BMI, triglycerides (TG), triglycerides-glucose (TyG) index, fasting glucose, AST/ALT ratio and TG/HDL-C ratio. Secondly, we identified individual acylcarnitines

and amino acids as mar-kers of MD that correlate with IR indexes and assessed their association with indirect indicators of IR.

HOMA-IR and QUICKI correlated with 7/7 indirect indicators of IR, SPISE with 6/7 and ISI- M with 5/7. Among MD markers, fasting levels and after glucose loading levels of alanine, leucine, valine and acylcarnitine C8:1 were significantly different between the insulin-resistant and the insulin-sensitive group ($p \leq 0.01$), determined by the median value HOMA-IR. Fasting levels of alanine and post-load levels of leucine correlated with fasting and post-load TG levels, TG/HDL-C ratio and TyG index, while post-load levels of leucine additionally correlated with AST/ALT ratio ($p \leq 0.05$ for all).

Individual acylcarnitines' and amino acids' levels during mOGTT were associa-ted with established IR indexes and with indirect indicators of IR, thus providing an insight into the pathophysiology of MD in obese children.

OC05

The role of initial HbA_{1C}, insulin requirement and diabetes duration on the efficacy of simplifying complex insulin regimen with fixed-ratio combinations: A retrospective evaluation of real-world data

R. Fejes[1], R. Kovács-Huber[1], C. Kádár[1] | [1]Hódmezővásárhely-Makó Healthcare Center, Department of Internal Medicine Makó, Hungary

Aims: Fixed-ratio combinations (FRCs) of glucagon-like peptide-1 receptor agonists and basal insulins offer a widely accepted alternative to simplify intensivied conventional insulin treatments (ICT). However, the effectiveness of simplification in patients with high total daily insulin dose (TDD) or high HbA_{1c} is still debated. Moreover, the correlation between disease duration and efficacy is not well understood.

Methods: Retrospective data were collected from type 2 diabetes patients undergoing simplification between 1 January 2017 and 1 January 2023. Of 159 patients, 66 were included. Patient cha-racteristics and therapy details at baseline and follow-up visits at 3, 6, 12, and 24 months after FRC initiation were recorded.

Results: Data are presented as median (IQR). Simplification led to a significant reduction in HbA_{1c} (7.65(1.85) % to 6.7(1) %) and in body weight (BW) (93.5(29.5) kg to 85.0(25.0) kg). Patients with HbA_{1c}>8.0% experienced a more pronounced reduction in HbA_{1c} compared to those with HbA_{1c}<8.0%, though this trend was not observed for BW. TDD did not affect HbA_{1c} or BW reduction, but TDD>60 units/day correlated with a significantly higher FRC dose (20.0(8.0) units/day vs. 25.5(12.0) units/day). A shorter diabetes duration correlated with greater HbA_{1c} reduction in patients with initial HbA_{1c}>8.0% ($r=0.78$; $p<0.001$). Disease duration did not influence the required FRC dose. Adherence to FRCs was 85%, with significantly fewer patients experiencing hypoglycemia (n=18 to n=4).

Conclusions: FRCs proved to be an effective alternative to ICT in patients with high HbA_{1c} and TDD. Patients with a shorter diabetes duration can expect more marked clinical improvement following simplification.

OC06

Understanding diabetic ketoacidosis: Incidence, predisposing factors and treatment implications in intensive care unit patients

K. Lapsova[1], I. Konrade[2], I. Orleane[2], I. Strele[1] | [1]Riga Stradiņš university Riga | [2]Riga East University Hospital Riga, Latvija

Introduction: Diabetic ketoacidosis (DKA) is a diabetic emergency that still accounts for hospitalizations and causes mortality. The mainstay of DKA therapy is administration of intravenous insulin infusion at 0.1 unit/kg, which may be reduced in some clinical cases. The aim of this study was to investigate the incidence and predisposing factors of DKA and the consequences of treatment.

Methods: Data of 213 patients admitted to the intensive care unit with DKA was analysed, focusing on the underlying causes. Among these patients, close monitoring of glucose levels was performed on 143 individuals over a 24-hour period along with the administration rate of insulin infusion.

Results: Mean age of patients was 46.4 ± 1.4 years. Among them, 52.6% (n=112) were diagnosed with type 1 diabetes mellitus (DM), 32.9% (n=70) had type 2 DM, and 14.6% (n=31) had other types of DM. The leading causes of DKA were poor treatment adherence in 34.3% of cases, followed by newly diagnosed diabetes (23.9%), alcohol use (14.6%), infection (6.6%), intercurrent illness (4.7%), and a combination of multiple causes (16%). The mean serum glucose decrease of 143 patients was 27.5 mmol/L or 70.4% from the baseline in the first 24-hours after diagnosis, treated with insulin infusion of 0.05 unit/kg. Additio-nally, 11% (n=16) experienced hypoglycemic episodes. Summary. Enhanced health literacy and restructured outpatient services could potentially prevent up to 50% of DKA hospitalizations. Adjustments in intravenous short-acting insulin dosages may be warranted for specific groups of patients.

OC07

Unraveling metabolic signatures of metformin treatment and response variability in type 2 diabetes: Implications for personalized medicine

K. Naja[1], N. Anwardeen[1], M. Elrayess[2] | [1]Biomedical Research Center Doha | [2]Qatar University (QU) Health, Doha, Qatar

Metformin is a cornerstone therapy in managing type 2 diabetes (T2D) and exhibits pleiotropic effects beyond glycemic control. However, there exists considerable inter-individual variability in response to metformin, necessitating a deeper understanding of its mechanisms. In this study, we aimed to elucidate metabolic signatures associated with metformin treatment and response variability, potentially informing personalized medicine approaches.

We conducted a cross-sectional analysis using clinical and metabolomic data from 265 patients with T2D retrieved from the Qatar Biobank. Patients were categorized into metformin-treated, treatment-naïve, and non-metformin treated groups. Additionally, metformin-treated patients were dichotomized into good and poor responders based on HbA_{1C} levels. Orthogonal partial least

square discriminate analysis (OPLS-DA) and linear models were employed to identify differences in metabolite levels between groups.

Among metformin-treated patients, we observed elevated levels of 3-hydroxyoctanoate and 3- hydroxydecanoate, indicative of altered fatty acid metabolism. Furthermore, good responders exhibited increased levels of sphingomyelins, acylcholines, and glutathione metabolites, suggesting enhanced lipid metabolism and antioxidant capacity. Conversely, poor responders displayed elevated levels of metabolites associated with glucose metabolism and gut microbiota, potentially implicating inefficient glucose utilization and altered gut microbiome composition.

These findings provide novel insights into the metabolic effects of metformin therapy and highlight distinct metabolic signatures associated with treatment response variability. Understanding these metabolic signatures may facilitate the development of predictive models for metformin efficacy and enable tailored therapeutic strategies in T2D management. Moreover, the identification of metabolites associated with metformin response variability opens avenues for personalized medicine approaches aimed at optimizing treatment outcomes in individuals with T2D.

OC08

Identification of novel adipose tissue and hepatic insulin resistant clusters across people with and without diabetes and different association with comorbidities

K. B. Bódis[1], K. Prystupa[2], C. Binsch[1], O. Zaharia[1], M. Schön[1], C. Moeser[1], I. Yurchenko[2], D. Mendez[2], P. Bobrov[3], G. Heilmann[2], Y. Kupriyanova[2], V. Schrauwen-Hinderling[2], G. Bönhof[1], V. Burkart[2], R. Gutthoff[4], H. Hauner[5], S. Meyhöfer[6], A. L. Birkenfeld[7], A. F. Pfeiffer[8], M. Blüher[9], S. Bornstein[10], M. Heni[11], J. Szendrödi[12], M. Roden[1], R. Wagner[1] | [1]Department of Endocrinology and Diabetology, Medical Faculty and University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Germany | [2]Institute for Clinical Diabetology, German Diabetes Center, Leibniz Center for Diabetes Research at Heinrich Heine University Düsseldorf Germany | [3]Institute for Biometrics and Epidemiology, German Diabetes Center, Leibniz Center for Diabetes Research at Heinrich Heine University Düsseldorf, Germany | [4]Department of Ophthalmology, Medical Faculty and University Hospital Düsseldorf, Heinrich Heine University Düsseldorf, Germany | [5]Institute of Nutritional Medicine, School of Medicine and Health, Technical University of Munich, Germany | [6]Department of Medicine I, University Hospital of Schleswig-Holstein, Lübeck, Germany | [7]Institute for Diabetes Research and Metabolic Diseases, University of Tübingen, Germany | [8]Department of Endocrinology, Diabetes and Nutrition, Charité Universitätsmedizin Berlin, Germany | [9]Department of Medicine, Endocrinology and Nephrology, University of Leipzig, Germany | [10]Department of Internal Medicine III, Dresden University of Technology, Germany | [11]Division of Endocrinology and Diabetology, Department of Internal Medicine 1, University Hospital Ulm, Germany | [12]Department of Medicine I and Clinical Chemistry, University Hospital of Heidelberg, Germany

Background: Insulin resistance characterizes type 2 diabetes (T2D), but can be also present in type 1 diabetes (T1D) and prediabetic states. This study aims to identify clusters of tissue- specific insulin resistance affecting skeletal muscle, liver and adipose tissue, to unravel its role in metabolic diversity.

Methods: This study employed k-means clustering in 759 participants (223 T1D, 346 T2D, 190 glucose-tolerant individuals, CON) of the German Diabetes Study (GDS). The clusters were established using glycemia (HbA_{1c}), whole-body insulin sensitivity (clamp-derived M-value), fasting endogenous-glucose-production and non-esterified fatty acids. Diabetes-related outcomes were assessed at baseline (<1 year of known diabetes-duration) and at 5 years later with annual interviews inbetween. All results were adjusted for age, sex, BMI, and diabetes type.

Results: Three distinct clusters were identified: a whole-body insulin sensitive (WISE: 73 T1D, 41 T2D, 151 CON) and two whole-body insulin resistant clusters, one displaying higher adipose tissue insulin resistance (AIRE: 50 T1D, 210 T2D, 39 CON) and one exhibiting higher hepatic insulin resistance (HIRE: 100 T1D, 95 T2D, 0 CON) compared to the other clusters. AIRE had greater visceral adiposity and hepatocellular lipid content (HCL) than WISE and HIRE, but also associated with lower peripheral nerve and renal function at the 5-year follow- up. HIRE displayed higher HCL than WISE, but lower HCL than AIRE and was more likely to receive insulin treatment over 5 years.

Conclusion: Irrespective of diabetes, assessment of tissue-specific insulin sensitivity enables the identification of adipose tissue and hepatic insulin resistant clusters with distinct risk profiles for diabetes-related comorbidities.

OC09

Scleredema diabeticorum

B. Pokoly[1], L. Fónyad[2], E. M. Müller[2], P. V. Bálint[2], P. Kempler[2] | [1]National Institute of Musculoskeletal Diseases Budapest | [2]Semmelweis University Budapest , Hungary

Scleredema diabeticorum is a peculiar complication of diabetes mellitus, which is considered rare or perhaps more precisely rarely recognized in everyday clinical practice. It belongs to the group of primary cutaneous mucinoses. It has an unknown underlying pathomechanism and can primarily affect the skin and subcutaneous connective tissue, causing diffuse induration and non-pitting swelling, beginning on the posterior neck and upper back and can therefore lead to limited cervical mobility. However, sometimes even various internal organs might be affected as well, giving rise to potentially life-threatening complications. After an initial brief historical overview and concerns regar-ding classification issues based on etiology and underlying conditions, we describe its usual clinical appearance and summarize specific histological changes which are characteristic of this progressive disease, give various prevalence data, diagnostic and differential diagnostic considerations, the potential regiment of treatment options, and finally present an in-depth case report, richly illustrated with microscopic and ultrasound pictures.

OC10

Visceral adipose tissue volume is higher in severe insulin resistant diabetes and associates with increased cardiovascular risk

O. P. Zaharia[1], Y. Kupriyanova[1], P. Bobrov[1], T. Mori[1], M. Schön[1], C. Möser[1], D. Mendez[1], N. Trinks[1], S. Trenkamp[1], K. Bódis[1], V. Schrauwen-Hinderling[1], R. Wagner[1], M. Roden[1] | [1]German Diabetes Center Düsseldorf

The recently-described severe insulin resistant diabetes (SIRD) cluster specifical-

ly relates to metabolic dysfunction-associated steatotic liver disease (MASLD). However, it is not yet known whether differences in other lipid depositions such as intramyocellular lipids (IMCL) or in adipose tissue compartments also exist compared to other clusters of new-onset diabetes. Participants (n=697) of the prospective German Diabetes Study underwent magnetic resonance imaging/spectroscopy to quantify IMCL in the tibialis anterior muscle, intrahepatic lipids (IHL), visceral adipose tissue (VAT) and subcutaneous adipose tissue (SAT) volumes. The clustering algorithm used age, sex, BMI, surrogates for insulin resistance and beta cell function (HOMA-IR, -B) and diabetes-rela-ted autoantibodies and is available online at www.diabetescalculator.ddz.de. SIRD (n=40) had the highest IHL compared to moderate obesity-related (MOD, n=215), moderate age-related (MARD, n=237) and severe autoimmune diabetes clusters (SAID, n=193; all p<0.01). Comparisons with severe insulin deficient diabetes (SIDD, n=12) did not reach statistical significance. Interestingly, SIRD presented with higher mean VAT (6089 cm^3) compared to MOD (3260 cm^3), MARD (3056 cm^3), SAID (1524 cm^3) even after correction for BMI (all p<0.05). Mean SAT was higher in SIRD than MARD (27879 vs. 17127 cm^3), yet differences to other clusters lost statistical significance after correction for BMI. We observed no differences in IMCL between clusters. VAT correlated with cardiovascular risk scores (Framingham, r=0.661, p<0.05), as did IHL (r=0.584, p<0.05). In conclusion, severely insulin resistant humans not only show increased hepatic lipids, but also present with an increased visceral adipose tissue volume which may contribute to increased cardiovascular risk.

OC11

Retrospective analysis of the effectiveness of oral semaglutide in type 2 diabetes outpatients at community health centre koper

M. Mir[1], J. Komel[1], A. Urbas[1] | [1]Outpatient Clinic, Community Health Center Koper, Slovenia

Introduction: In a retrospective study, we evaluated the effectiveness and safety of oral semaglutide in a diverse cohort of type 2 diabetes (T2D) patients in real-world outpatient settings at our clinic.

Methods: We collected medical records data (at 4 timepoints: baseline, 6, 12, and 18 months) from 451 patients initiated on oral semaglutide following approved indications. The baseline characteristics of the final effectiveness analysis set (n=316) were: 185 (59%) males; mean age 63.1 years (29-87); mean HbA_{1c} 8.0% (5.6-13.0); mean body weight (BW) 95 kg (49-156); baseline tiers of therapy: none 18, monotherapy 79, dual therapy 101, triple therapy 118 patients. We assessed reductions in HbA_{1c}, BW, and BMI using the linear mixed model approach.

Results: The mean decrease in HbA1c from baseline was highly significant at all time points ([%] -0.80, -0.95, -0.84 at 6, 12, and 18 months, respectively; p < 0.001). Similarly, reductions in BW and BMI from baseline were also highly significant at all time points (BW [kg]: -3.1, -3.9, -4.4; BMI [kg/m^2]: -1.1, -1.3, -1.5 at 6, 12, and 18 months, respectively; p < 0.001). At 6 months, 15.5% of the 264 patients with baseline HbA_{1c} ≥7.0% achieved HbA_{1c} <7.0%, and 66.3% of 294 patients achieved a reduction in HbA_{1c} of ≥0.5%. Semaglutide was discontinued in 25.5% of the full analysis set (n=451).

Conclusion: The study proves that oral semaglutide effectively and safely achieved significant reductions in HbA_{1c}, BW and BMI over the 18 months period in a cohort of T2D patients in our daily practice.

Keywords: oral semaglutide, type 2 diabetes mellitus, real-world data, HbA_{1c}

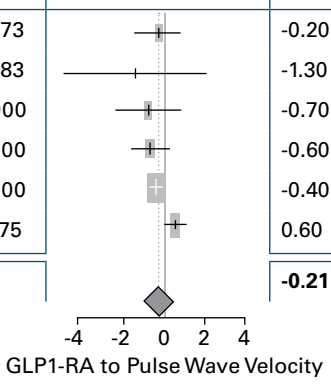
OC12

The effect of GLP-1 receptor agonists on arterial stiffness: A meta-analysis of randomized controlled trials.

M. Rizzo[1], C. F. Tagkas[2], A. Asimakopoulos[3], E. E. Ntzani[4], G. Anastasiou[5], A. Agouridis[6], V. Tsimihodimos[5], E. C Rizos[7], F. Barkas[8] | [1]School of Medicine, Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical Specialties (Promise), University of Palermo, Italy | [2]Department of Hygiene and Epidemiology, University of Ioannina School of Medicine, Ioannina, Greece | [3]Department of Primary Education, University of Ioannina, Greece | [4]Department of Hygiene and Epidemiology, University of Ioannina

Study	GLP1-RA Total	GLP1-RA Mean	GLP1-RA SD	Placebo/St. care Total	Placebo/St. care Mean	Placebo/St. care SD	Mean Difference	MD	95%-CI	Weight
Dejgaard, 2017[29]	50	8.30	2.3450	50	8.50	3.4273		-0.20	[-1.35; 0.95]	12.9%
Scalzo, 2017[30]	11	10.20	4.6433	12	11.50	3.6483		-1.30	[-4.73; 2.13]	2.0%
Lambadian, 2018[26]	30	10.30	3.3000	30	11.00	3.0000		-0.70	[-2.30; 0.90]	7.9%
Ikonomidis, 2020[22]	40	10.50	1.9000	40	11.10	2.3000		-0.60	[-1.52; 0.32]	16.9%
Tuttolomondo, 2021[18]	56	10.60	0.8100	56	11.00	0.6000		-0.40	[-0.66; -0.14]	36.0%
Vernstrom, 2024[34]	30	9.90	1.2575	30	9.30	1.2575		0.60	[-0.04; 1.24]	24.3%
Random effects model	**217**			**218**				**-0.21**	**[-0.71; 0.29]**	**100.0%**

Heterogeneity I^2 = 46%, t^2 = 0.1639, p<0.10



OC12 – Figure 1. Meta-analysis of RCTs for GLP1-RAs and PWV.

School of Medicine, Ioannina, Greece | [5]Department of Internal Medicine, University Hospital of Ioannina, Greece | [6]School of Medicine, European University Cyprus Nicosia, Cyprus | [7]School of Health Sciences, University of Ioannina, Greece | [8]Department of Internal Medicine, Faculty of Medicine, School of Health Sciences, University of Ioannina, Greece

Background and aim: Pulse wave velocity (PWV) and augmentation index (AIx) are indices used to assess arterial stiffness. Stiffening of the arteries is considered as target organ damage and the measurement of PWV and AIx indices for the detection of hypertension-mediated organ damage. We evaluated the published evidence stemming from RCTs of GLP1 receptor agonists (GLP1-RA), new antidiabetic medications, on arterial stiffness.

Materials and methods: We searched PubMed (up to January 2024) using a specific algorithm for RCTs on English language assessing the effect of GLP1-RA on arterial stiffness with eligible reporting outcomes PWV and AIx. We included studies which assessed the administration of GLP1-RA vs. placebo or an active comparator which could be any agent excluding SGLT2i or GLP1-RA. We also excluded trials with treatment duration less than 4 weeks because this time window does not allow enough time for the intervention to show any effect. The methodological quality of the included trials was evaluated by using elements of the Cochrane collaboration tool for assessing risk of bias. Effect sizes of the included studies were expressed as weighted mean difference (WMD) and 95% confidence interval (CI) and DerSimonian and Laird random- effects model was used in our meta-analysis to calculate the WMD and its 95% CI. Statistical heterogeneity was assessed using the I^2 statistic. Publication bias was explored by assessing small study effects using the Egger's weighted regression and visual inspection of funnel plots. Subgroup analyses were performed based on comparator (placebo vs. active comparator), design (RCT vs. crossover), population (diabetic vs. all) and blindness (yes vs. no).

Results and Conclusion: From 182 citations assessed initially, a total of 5 studies on GLP1-RA assessing 727 participants were included. For PWV, we included in our meta-analysis 6 studies with 435 participants, while for AIx we included 4 studies pertaining to 292 participants. We did not find any statistically significant association between the use of GLP1-RA and changes in PWV (WMD = -0.21; 95% CI -0.71, 0.29; I^2 = 46%). Also, the administration of GLP1-RA was not statistically significant associated with AIx change (WMD = -0.36; 95% CI -1.94, 1.22; I^2 = 0%). The Egger's test and Funnel plots showed no evidence of small study effect (p-value=0.914 for PWV and p-value=0.505 for AIx). Subgroup analyses based on active comparator vs. placebo, parallel RCT vs. crossover, or the existence of type 2 diabetes, did not show any statistically significant results for both PWV and AIx. In conclusion, treatment with GLP1-RA had no effect on classical vascular measures of arterial stiffness. Well-designed powerful studies of high methodological quality in selected populations of interest may shed light to any potential effects on arterial stiffness following the administration of these agents.

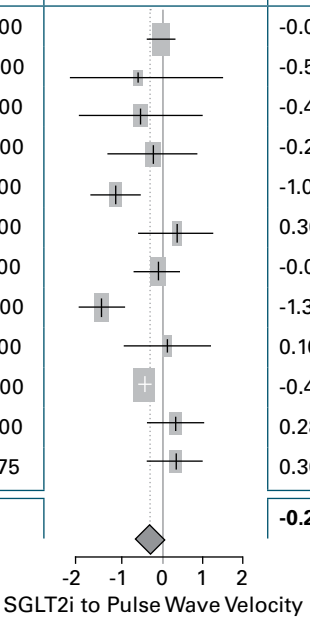
OC13

The effect of SGLT2 inhibitors on arterial stiffness: A meta-analysis of randomized controlled trials.

M. Rizzo[1], C. F. Tagkas[2], A. I. Asimakopoulos[4,3], E. E. Ntzani[4], G. Anastasiou[5], A. P. Agouridis[6], V. Tsimihodimos[5], E. C. Rizos[7], F. Barkas[8] | [1]School of Medicine, Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical

	SGLT2i			Placebo/St. care						
Study	**Total**	**Mean**	**SD**	**Total**	**Mean**	**SD**	**Mean Difference**	**MD**	**95%-CI**	**Weight**
Striepe, 2017[27]	76	8.76	1.0000	76	8.81	1.0000		-0.05	[-0.37; 0.27]	11.9%
Ramirez, 2019[25]	15	8.00	3.0000	15	8.50	2.0000		-0.50	[-2.32; 1.32]	2.6%
Solini, 2019[24]	20	10.18	1.4700	20	10.63	2.6500		-0.45	[-1.78; 0.88]	4.2%
Ikonomidis, 2020[22]	40	10.90	2.1000	40	11.10	2.3000		-0.20	[-1.17; 0.77]	6.2%
Requena-Ibáñez, 2021[16]	38	5.60	1.2000	38	6.60	1.3000		-1.00	[-1.56; -0.44]	9.6%
Kolwetter, 2021[15]	48	8.70	1.7000	26	8.40	1.7000		0.30	[-0.51; 1.11]	7.4%
Papadopoulou, 2021[20]	43	8.66	1.1000	42	8.75	1.2500		-0.09	[-0.59; 0.41]	10.2%
Nandula, 2021[17]	15	10.12	0.6300	14	11.42	0.7000		-1.30	[-1.79; -0.81]	10.4%
Lundin, 2022[12]	20	6.50	1.7000	22	6.40	1.5000		0.10	[-0.87; 1.07]	6.1%
Lytwyn, 2022[13]	33	7.30	0.2000	33	7.70	0.2000		-0.40	[-0.50; -0.30]	13.3%
Herring, 2023[11]	9	9.35	0.6000	9	9.07	0.7200		0.28	[-0.33; 0.89]	9.1%
Vernstrom, 2024[34]	30	9.60	1.2575	30	9.30	1.2575		0.30	[-0.34; 0.94]	8.9%
Random effects model	**387**			**365**				**-0.26**	**[-0.59; 0.06]**	**100.0%**

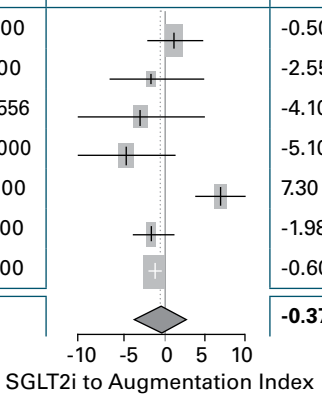
Heterogeneity I^2 = 70%, t^2 = 0.2068, p<0.01



OC13 – Figure 1. Meta-analysis of RCTs for SGLT2i and PWV.

Study	SGLT2i Total	SGLT2i Mean	SGLT2i SD	Placebo/St. care Total	Placebo/St. care Mean	Placebo/St. care SD	Mean Difference	MD	95%-CI	Weight
Ott, 2017[28]	59	24.10	8.7000	76	23.60	8.1000		-0.50	[-2.53; 3.53]	15.8%
Solini, 2019[24]	20	20.89	9.4900	20	23.44	7.9700		-2.55	[-7.98; 2.88]	12.0%
Ikonomidis, 2020[22]	40	10.40	15.5556	40	14.50	15.5556		-4.10	[-10.92; 2.72]	10.0%
Bommel, 2021[21]	24	21.10	7.6000	20	26.20	12.7000		-5.10	[-11.44; 1.24]	10.7%
Nandula, 2021[17]	15	28.67	2.8000	14	21.37	3.2000		7.30	[5.11; 9.49]	17.0%
Papapodouglou, 2021[20]	43	23.25	6.8300	42	25.23	6.8100		-1.98	[-4.88; 0.92]	16.0%
Lytwyn, 2022[13]	33	-3.80	1.2000	33	-3.20	1.2000		-0.60	[-1.18; -0.02]	18.4%
Random effects model	**234**			**228**				**-0.37**	**[-3.56; 2.82]**	**100.0%**

Heterogeneity $/^2$ = 89%, t^2 = 14.3174, p<0.01



OC13 – Figure 2. Meta-analysis of RCTs for SGLT2i and AIx.

Specialties (Promise), University of Palermo, Italy | [2]Department of Hygiene and Epidemiology, University of Ioannina School of Medicine, Ioannina, Greece | [3]Department of Primary Education, University of Ioannina, Greece | [4]Department of Hygiene and Epidemiology, University of Ioannina School of Medicine, Ioannina, Greece | [5]Department of Internal Medicine, University Hospital of Ioannina, Greece | [6]School of Medicine, European University Cyprus, Nicosia | [7]School of Health Sciences, University of Ioannina, Greece | [8]Department of Internal Medicine, Faculty of Medicine, School of Health Sciences, University of Ioannina, Greece

Background and aims: Pulse wave velocity (PWV) and augmentation index (AIx) are indices used to assess arterial stiffness. Stiffening of the arteries is considered as target organ damage and the measurement of PWV and AIx indices for the detection of hypertension-mediated organ damage. We evaluated the published evidence stemming from RCTs of Sodium Glucose co-Transporter-2 inhibitors (SGLT2i), new antidiabetic medications, on arterial stiffness.

Materials and methods: We searched PubMed (up to January 2024) using a specific algorithm for RCTs on English language assessing the effect of SGLT2i on arterial stiffness with eligible reporting outcomes PWV and AIx. We included studies which assessed the administration of SGLT2i vs. placebo or an active comparator which could be any agent excluding SGLT2i or GLP1-RA. We also excluded trials with treatment duration less than 4 weeks because this time window does not allow enough time for the intervention to show any effect. The metho-dological quality of the included trials was evaluated by using elements of the Cochrane collaboration tool for assessing risk of bias. Effect sizes of the included studies were expressed as weighted mean difference (WMD) and 95% confidence interval (CI) and DerSimonian and Laird random-effects model was used in our meta-analysis to calculate the WMD and its 95% CI. Statistical heterogeneity was assessed using the I^2 statistic. Publication bias was explored by assessing small study effects using the Egger's weighted regression and visual inspection of funnel plots. Subgroup analyses were performed based on comparator (placebo vs. active comparator), design (RCT vs. crossover), population (diabetic vs. all) and blindness (yes vs. no).

Results and Conclusion: From 182 citations assessed initially, a total of 12 studies on SGLT2i assessing 1.267 participants were included. For PWV, we included in our meta-analysis 12 studies with 752 participants, while for AIx we included 7 studies pertaining to 462 participants. We did not find any statistically significant association between the use of SGLT2i and changes in PWV (WMD = -0.26; 95% CI -0.59, 0.06; I^2 = 70%). Also, the administration of SGLT2i was not statistically significant associated with AIx change (WMD = -0.37; 95% CI -3.56, 2.82; I^2 = 89%). The Egger's test and Funnel plots showed no evidence of small study effect (p-value=0.312 for PWV and p-value=0.855 for AIx). Subgroup analyses based on active comparator vs. placebo, parallel RCT vs. crossover, or the existence of type 2 diabetes, did not show any statistically significant results for both PWV and AIx. In conclusion, treatment with SGLT2i had no effect on classical vascular measures of arterial stiffness. Well-designed powerful studies of high methodological quality in selected populations of interest may shed light to any potential effects on arterial stiffness following the administration of these agents.

OC14

Metformin reduces fasting blood glucose by promoting glycolysis and glucose clearance independently of endogenous glucose production in well-controlled type 2 diabetes

T. Sarabhai[1], T. LaMoia[2], M. Jonuscheit[1], V. Schrauwen-Hinderling[1], S. Friesl[1], K. F. Petersen[2], G. I. Shulman[2], M. Roden[1] | [1]German Diabetes Center Düsseldorf | [2]Yale School of Medicine New Haven, Connecticut, USA

Metformin is known to improve glycemic control in individuals with poorly-controlled type 2 diabetes (T2D) mainly by reducing rates of endogenous glucose production (EGP). Here, we investigated the unknown mechanisms by which metformin reduces fasting blood glucose levels in well-controlled individuals with T2D.

We examined hepatic glucose and energy metabolism in individuals with

T2D who were near-normoglycemic (N-T2D; n=10, age 59±7 years, BMI 29±2 kg/m^2, HbA_{1c} 7±1%) or hyperglycemic (H-T2D; n=8, age 62±2 years, BMI 28±1 kg/m^2, HbA_{1c} 9±1%). All participants were studied with (M+; 1000 mg bid) or without (M-) metformin treatment for two weeks. Rates of substrate turnover were determined using [2H7] glucose and [3-13C]lactate, while hepatic energy metabolism was monitored by 31P/13C-magnetic resonance spectroscopy. In N-T2D and H-T2D, metformin treatment reduced fasting plasma glucose concentrations by ~30% ($p<0.005$ vs. M-), increased rates of glucose clearance by ~25% ($p<0.05$ vs. M-) as well as lactate production (+14%, $p<0.01$ vs. M- in N-T2D) resulting in increased plasma lactate concentrations (~40%; $p<0.01$ vs. M-). Only in H-T2D, but not in N-T2D, metformin also reduced rates of EGP (-13%; $p<0.05$ vs. M-). In both groups, metformin treatment resulted in an ~30% increase in hepatic glycogen content ($p<0.05$ vs. M-) and a ~25% decrease in hepatic ATP content ($p<0.05$ vs. M-).

Independent of the degree of hyperglycemia, metformin lowers fasting plasma glucose concentrations by stimulating glucose clearance and promoting glycolysis. In addition, metformin reduces fasting plasma glucose concentration by reducing rates of EGP, but only in individuals with poorly-controlled T2D.

OC15

Is there any importance of inflammatory processes in the development of metabolic syndrome and type 2 diabetes mellitus in obese patients?

I. Var[1], E. Kocaturk[1], M. Bilgin[2], H. Kayadibi[1], M. N. Kebapci[3] | [1]Medical Biochemistry Eskisehir, Turkey | [2]Biostatistics Eskisehir, Turkey | [3]Endocrinology and Metabolic Diseases Eskisehir, Turkey

Objective: The release of inflammatory cytokines by adipose tissue is associated with the development of metabolic syndrome (MetS) and type 2 diabetes Mellitus (T2DM). In this study, we aimed to determine the role and importance of inflammatory processes in the development of obesity, MetS and T2DM.

Method: 160 participants were included in the study. Participants were classified using body mass index (BMI), NCEP-ATP III metabolic syndrome and ADA diabetes diagnostic criteria. C-reactive protein (CRP), interleukin-6 (IL-6), tumor necrosis factor-alpha (TNF-α) levels, leukocyte and its subgroup counts were used to evaluate inflammatory processes. All data were analysed using the SPSS package program. This study was financially supported by the Scientific Research Projects Commission of the Eskisehir Osmangazi University (Turkiye, Project Number: TYL-2022-2331)

Results: In this study, CRP and IL-6 values were positively correlated with BMI, weight, waist circumference, triglycerides and HOMA-IR. Leukocyte, lymphocyte and basophil counts were lower in the non-obese group than in the obese+MetS group and leukocyte, neutrophil, monocyte and eosinophil counts were lower in the obese group. Leucocyte levels were positively correlated with weight, BMI, waist circumference, glucose, triglycerides, glycated hemoglobin and HOMA-IR values and negatively correlated with high-density lipoprotein cholesterol levels.

Conclusion: Our results support that inflammatory parameters may be an indicator in the development of obesity, MetS and T2DM. It is thought that it may be important to analyse these parameters especially in newly diagnosed patient groups.

Keywords: CRP, inflammation, IL-6, leucocyte and its subgroup, metabolic syndrome, obesity, TNF-α, type 2 diabetes mellitus.

OC16

Comparative efficacy of exercise and metformin interventions on glycemic control in prediabetes: A network meta-analysis of randomized controlled trials

T. Zhao[1], Q. Yang[2], J. Feuerbacher[3], B. Yu[1], C. Brinkmann[4], S. Cheng[5], W. Bloch [1], M. Schumann[3] | [1]Department of Molecular and Cellular Sports Medicine, German Sport University, Cologne, Germany | [2]Department of Physical Education, Shanghai Jiao Tong University, Shanghai, China | [3]Department of Sports Medicine and Exercise Therapy, Institute of Human Movement Science and Health, Chemnitz University of Technology, Germany | [4]Department of Preventive and Rehabilitative Sport Medicine, German Sport University, Cologne, Germany | [5]Exercise Translational Medicine Centre, Shanghai Centre for Systems Biomedicine, Shanghai Jiao Tong University, Shanghai, China

Background: Metformin and exercise training are both recommended in prediabetes to delay the development of diabetes. However, some studies opposed the use of metformin in individuals with prediabetes, where exercise might be an alternative treatment with no major side effects and pharmaceutical expenditure.

Aim: To compare the efficacy of exercise versus metformin on hemoglobin A_{1c} (HbA_{1c}) in individuals with prediabetes.

Methods: We performed a systematic review and network meta-analysis based on searches of Embase, Web of Science, PubMed/MEDLINE, and SPORTDiscus from 1990 to Feb. 2023. Randomized controlled trials (RCTs) of exercise or metformin treatment in individuals with prediabetes were included. We estimated pooled mean differences (MD) with 95% confidence intervals (CI) for HbA_{1c} (%) via a random effect model. Analyses were performed based on two-level classification of interventions: general classification (i.e., exercise and metformin) and detailed classification (i.e., six types of exercise and low/high doses of metformin). This study is part of a larger syste-matic review registered with PROSPERO (CRD42023400622).

Results: 60 RCTs with 4,997 participants were included. We found that exercise was overall more efficient than metformin in improving HbA_{1c} (MD –0.17% 95% CI [–0.23 to –0.11] and –0.09% [–0.20 to 0.01], respectively). Considering the exercise specifics, aerobic interval training was shown as the most effective treatment (–0.27% [–0.44 to –0.09]).

Conclusion: Our findings further support the viewpoint that individuals with high risk of diabetes should firstly receive appropriate lifestyle interventions (e.g., regular physical exercise) rather than metformin treatment.

OC17

Combining next generation RNA sequencing and metabolic phenotyping to elucidate molecular mechanisms of reduced mitochondrial respiration in skeletal muscle of humans with type 2 diabetes

M. Schön[1], D. Oehler[2], I. Yurchenko[1], A. Lang[2], N. Trinks[1], C. Granata[1], O. Zaharia[1], L.. Mastrototaro[1], B. Dewidar[1], K. Bódis[1], R. Westenfeld[2], V. Burkart[1], R. Wagner[1], M. Roden[1], J. Szendroedi[3] | [1]Institute for Clinical Diabetology, German Diabetes Center Düsseldorf, Germany | [2]Division of Cardiology, Pulmonology, and Vascular Medicine, Medical Faculty, Heinrich-Heine University Düsseldorf, Germany | [3]Department of Medicine I and Clinical Chemistry, University Hospital of Heidelberg, Germany

Background and aims: Full-length transcriptomics enables precise detection of isoforms with 99% accuracy in an unbiased approach. Combined with comprehensive metabolic phenotyping, we applied SMRT-Seq in human skeletal muscle to elucidate mechanisms underlying reduced mitochondrial respiration in type 2 diabetes (T2D).

Materials and methods: Muscle biopsies were taken from 9 humans with T2D as well as 9 age- and body mass index-matched glucose tolerant men (CON). Whole-body insulin sensitivity (WBIS) was assessed by hyperinsulinemic-euglycemic clamps and muscle mitochondrial respiration by high-resolution respirometry. In muscle samples, SMRT-Seq was used to create full-length reads and isoforms, which were mapped to genome. Short-read Seq was employed to compare isoform expression between the groups.

Results: T2D had lower WBIS (4.5±1.6 vs. 11.1±2.9 mg*kg-1*min-1, p<0.001), fatty acid- driven (16.9±3.2 vs. 24.9±8.3 pmol O2 s-1 mg-1; p=0.022) and complex I (34.8±7.1 vs. 38.6±5.9 pmol O_2 s-1 mg-1; p=0.036) muscle mitochondrial respiration than CON. SMRT-Seq identified ~14 000 unique genes with ~67 000 unique isoforms in human ske-letal muscle, and detected 4 splicing variants of a gene encoding the F1 subunit of α ATP synthase (ATP5F1A). Based on comparative transcriptomics, its expression levels were lower in muscle of T2D than in CON (p<0.001), who also exclusively expressed two of the novel transcripts.

Conclusion: This study identified splicing variants of ATP synthase, which are differentially expressed between people with T2D and those with normal glucose tolerance, which may contribute to the lower mitochondrial oxidative capacity in T2D.

OC18

Complications of a complication: Mauriac syndrome and more – a case report

F. G. Panculescu[1], D. Catrinoiu[1], T. Chisnoiu[1], C. M. Mihai[1] | [1]Ovidius University of Constanta, Romania

Background and aims: Glycogenic hepatopathy or hepatic glycogenosis is a rare complication in patients with poorly controlled type 1 diabetes mellitus (T1DM). Glycogen reload in the liver was first described in children by Mauriac in 1930 as a component of Mauriac's syndrome (MS), a rare disease characterized by he-patomegaly with transaminase elevation, puberty and growth failure, dwarfism, dyslipidaemia, reduction of insulin-like growth factor 1, cushingoid features. We also know that pancreatitis can occur in patients with elevated lipid levels and po-ses a serious complication in the management of a diabetic patient.

Material and methods: We will present a case of Mauriac Syndrome who was found to have short stature, hepatom-egaly, delayed puberty and malnutrition and presented an unsatisfying evolution of the disease with poor glycemic and lipid control which led to acute and chronic complications.

Results: In this case, poor compliance because of poor literacy was the main cause behind the poorly controlled diabetes. Inadequate glucose to the tissues, decreased insulin like growth factor 1 and growth hormone level, and hypercortisolism may contribute to delayed growth and puberty. Abdominal ultrasound in our case shows hepatomegaly, increased echogenicity, APLDH Diameter 210 mm. The X-ray for bone age corresponding to the age of 7 years and Tanner stage: I prepubertal. Growth failure, delayed puberty and hepatomegaly in Mauriac syndrome should improve with glycemic control but in this case, even with the latest technologies of CGM augumented insulin pump, the glycemic targets were not obtained (HbA_{1c} of 18.9%) because of poor compliance of diet and treatment indications. More than that, acute pancreatitis occurred, which made the case even more difficult to manage, with following DKA episodes, after multiple hospitalization episodes.

Conclusion: It's important to recognise and treat this complication of type 1 diabetes in patients with poorly metabolic control with hepatomegaly associated with transaminase and lipid levels elevation although it is a rare entity in developed countries and represents a true challenge in case management, even with sensor and insulin pump, if the patient is non compliant.

Keywords: Mauriac, type 1 diabetes, Pancreatitis

OC19

Syndemic approach for cardio-metabolic diseases: The lesson from the cardiometabolic panel of international experts on syndemic COVID-19 (capisco)

M. Galia[1], E. Grassedonio[1], G. Filorizzo[1], W. Al Mahmeed[2], M. Banach[3], M. Cesur[4], F. Cosentino[5], A. Firenze[6], A. Janez[7], P. Kempler[8], N. Papanas[9], A. Stoian[10], M. Rizzo[11] | [1]Department of Biomedicine, Neurosciences and Advanced Diagnostics (Bind) Palermo, Italy | [2]Heart and Vascular Institute, Cleveland Clinic Abu Dhabi, United Arab Emirates | [3]Department of Preventive Cardiology and Lipidology Medical University of Lodz (MUL), Poland | [4]Clinic of Endocrinology Ankara Güven Hospital, Ankara, Turkey | [5]Karolinska Institute and Karolinska University Hospital University of Stockholm, Sweden | [6]Unit of Research and International Cooperation University Hospital of Palermo, Italy | [7]Department of Endocrinology, Diabetes and Metabolic Diseases University Medical Center, Ljubljana, Slovenia | [8]Department of Medicine and Oncology, Semmelweis University, Budapest, Hungary | [9]Diabetes Center, Second Department of Internal Medicine, Democritus University of Thrace University Hospital of Alexandroupolis, Greece | [10]Faculty of Medicine, Diabetes, Nutrition and Metabolic Diseases Carol Davila University, Bucharest, Romania | [11]Department of Health Promotion, Mother and Child Care, Internal Medicine and Medical Specialties (ProMise) School of Medicine, University of Palermo, Italy

We are currently living in a post-COVID era, where we have successfully fought against the coronavirus, but still, patients with chronic diseases continue to have many barriers to access healthcare facilities and their regular control visits, as it was before the pandemic. This is particularly true for patients with cardiometabolic diseases, such as those with obesity and diabetes, who are still experiencing an increased number of complications and higher rates of mortality. In addition, increasing socio-economic disparities

have come to the forefront in many populations during the pandemic, rende-ring people more vulnerable to economic, nutritional, social, and medical insecurity, particularly during prolonged periods of necessary government-imposed restrictions or even lockdowns. A syndemic approach needs to be adopted, given the strong interplay between cardiometabolic diseases and the socio-structural environment. The term syndemic emphasizes the relevance of biological, social, economic, and environmental factors in the health of individuals and populations. Physicians have an obligation to understand their patients' social, economic, and environmental situations and to utilize the tools available in existing health systems to improve their access to care. It is also expected that many health systems will continue to be under significant economic pressure, whichmay contribute to a reduced quality of care for patients with chronic conditions, such as those with cardiometabolic diseases. People with Long COVID may experience a variety of symptoms such as chronic fatigue, shortness of breath, cough, chest pain, palpitations, headache, arthralgia, myalgia and weakness, insomnia, numbness, diarrhea, cognitive defects, rash, hair loss, imbalance and gait problems, memory and concentration defects and poor quality of life. Radiology plays an important role in the diagnosis and evaluation of Long COVID patients by enabling the detection of complications in various organs, in particular involving the lungs, heart, nerves, abdomen, musculoskeletal systems and oral cavity.

OC20

Diagnostic challenge in adult patients with type 1 diabetes mellitus

A. Niculica[1], F. Urzica[1], A. Mihalcea[1], M. Botan[1], A. Uta[1], T. Salmen[2], C. Bica[2], A. Pantea-Stoian[3] | [1]Department of Diabetes, Nutrition and Metabolic Diseases, Bucharest, Romania | [2]Doctoral School of Carol Davila, University of Medicine and Pharmacy, Bucharest, Romania | [3]Department of Diabetes, Nutrition and Metabolic Diseases, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

Introduction: Type 1 diabetes mellitus (T1DM) used to be considered a disease of childhood and adolescence. However, recent studies have shown that there is an increasing number of adults being diagnosed with T1DM. Concurrently, the prevalence of obesity worldwide has reached concerning levels, which can make it harder to diagnose T1DM due to overlapping symptoms with type 2 diabetes mellitus (T2DM).

Materials and methods: A retrospective study on patients hospitalized for acute hyperglycemia in Paulescu Institute, Romania during 2023 enrolled the patients with positive anti-glutamic acid decarboxylase (GAD) autoantibodies. We collected demographic data, metabolic (glycemic and lipid) profile, C peptide level, and the presence of metabolic syndrome (MS) criteria.

Results and discussions: The cohort consisted of 156 patients, 54.5 % males, with a mean age of 38.1±13.7 years. DM type was 22.43% T1DM, 19.87% T2DM and 57.69% were newly diagnosed. At discharge, 16.67% of patients were considered to have T2DM. Overweight and obesity before the onset of specific symptoms were 30.6% and 33.33%, respectively. The mean serum C-peptide was 0.8 (0.01,4.9) ng/ml, and it correlated positively with the body mass index ($r=0.5$, $p<0.01$). 55.55% of the patients fulfilled the NCEP ATP III criteria of MS and had a higher TG/HDLc ratio (14.7 vs 1.7, $p<0.01$), an indirect marker of insulin resistance.

Conclusions: Formerly obese individuals presenting with DM symptoms are initially misdiagnosed as T2DM in the absence of an accurate diagnosis with a comprehensive approach (clinical assessment, laboratory tests, and immunological markers).

Keywords: T1DM, insulin resistance, obesity, TG/HDLc ratio

OC21

Assessing the association between neutrophil-to-lymphocyte ratio (NLR) and peripheral arterial disease with subsequent amputation – a retrospective study:

F. Urzica[1], M. Botan[1], A. Niculica[1], A. Mihalcea[1], D. Visan[1], A. Uta[1], A. Moise[1], M. Ciocarlan[1], C. Diaconu[2], I. Bica[2], T. Salmen[2], A. Pantea-Stoian[3] | [1]Department of Diabetes, Nutrition and Metabolic Diseases, Bucharest, Romania | [2]Doctoral School of Carol Davila, University of Medicine and Pharmacy, Bucharest, Romania | [3]Department of Diabetes, Nutrition and Metabolic Diseases, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

Background: Diabetes mellitus (DM) can lead to severe complications like peripheral arterial disease (PAD) and limb amputation. Inflammation is a key factor in developing these conditions, suggesting a link between systemic inflammatory markers, like the neutrophil-to-lymphocyte ratio (NLR), and disease severity.

Materials and methods: 2261 medical records of consecutively hospitalized type 2 diabetes patients at the Bucharest National Institute of Diabetes and Metabolic Diseases were studied retrospectively. The study extracted demographic information, medical history, NLR levels, ankle-brachial index (ABI), and diabetic foot complications such as amputations. A cut-off value of ABI of ≤0.9 was used to diagnose PAD and ≥3 for a pathological NLR. The study used SPSS software for statistical analysis, including correlation tests and logistic regression, to assess the link between NLR and diabetic foot complications.

Results and discussions: The study group's mean age was 59±14.47 years, with 53.9% males; 34.5% of patients had an NLR above 3 with a mean of 5.7±5.4. Elevated NLR levels were significantly associated with a higher incidence of PAD ($p < 0.05$), with more patients with high NLR levels being diagnosed with PAD (23.6% vs. 20.4%) compared to the regular NLR group. DM patients with elevated NLR levels had a significantly increased risk of lower limb amputation (10% vs 6.1%, $p < 0.01$).

Conclusion: Our analysis shows a link between high NLR levels and PAD incidence and lower limb amputation risk in DM patients. Early detection of eleva-ted NLR levels enables targeted interventions to mitigate PAD progression and reduce amputation in this population.

Keywords: Neutrophil-to-lymphocyte ratio; Peripheral Arterial Disease; Amputation; Diabetes mellitus.

OC22

Gender differences in nutritional behaviors: The influence of body composition

A. Feraco[1], A. Armani [1], E. Camajani[1], S. Gorini [1], R. Strollo[1], E. Padua[1], M. Lombardo[1], M. Caprio[1] | [1]Department of Human Sciences and Promotion of the Quality of Life, San Raffaele Roma Open University Rome, Italy

Gender represents an important variable in the analysis of obesity with specific differences in terms of body composition and fat distribution depending on hormonal backgrounds. Importantly, sex hormones influence also food preferences and eating habits. A deeper understanding of the complex interplay among body composition, gender, and food-related behavior is crucial for improving well-being and lifestyle, thus preventing diet-related diseases. The present study aimed to explore how differences in emotional and psychological reactions to food may influence the susceptibility of men and women to develop obesity and eating disorders. We performed a cross-sectional study on 1333 subjects (58.7% female, 41.3% male), aged bet-ween 18 and 65 years, to investigate the potential effects of the interactions of body composition with gender on nutritional habits and physical activity. The enrolled individuals, categorized into tertiles according to the distribution of the fat mass to fat-free mass (FM-to-FFM) ratio, displayed gender-specific differences for food eating habits. The perception of hunger varied throughout the day between males and females, with males showing a greater sense of hunger in the late afternoon, particularly overweight subjects, while females tended to experience the perception of hunger in the morning. There were remarkable differences in food preferences among FM-to-FFM tertiles and genders, and males displayed a higher preference towards processed and red meats, whereas females showed preference for cooked vegetables. Skipped meal patterns, uncontrolled eating behavior, nocturnal eating habits and taste preferences (sweet or salty) showed distinct profiles among FM-to-FFM tertiles and between genders. In addition, an association was observed between higher FM-to-FFM ratios and lower physical activity, in particular for strength training. These fin-dings highlight the complex relationship between body composition and gender-specific differences affecting nutritional habits and lifestyle, and confirm the need for personalised approaches in the development of dietary guidelines and nutritional interventions for the prevention of obesity and metabolic alterations related to fat accumulation.

OC23

HFpEF and glycemic variability: Ghidd trial

G. Fazio[1], D. Gioia[1] | [1] Department of Cardiology, Internal medicine, angiology and long term care, Palermo, Italy

Background: Recently the guidelines of European Association of Preventive Cardiology reported that the prevalence of diabetes mellitus in patients with diastolic heart failure (HFpEF) is around 31%. The ADA recommends using any of these four criteria for diabetes diagnosis Haemoglobin A_{1C} ≥6.5% or Fasting plasma glucose (FPG) ≥126 mg/dL or random plasma glucose (PG) ≥200 mg/dL. Glunovo® is a transdermal device capable of detecting and storing the concentration of glucose in the abdominal interstitial fluid 480 times a day for up to 14 consecutive days. It is a new generation system for the continuous monitoring of blood glucose. It also allows the display of graphs regarding the trend and distribution of glycaemic results, that provides a glucose data curve: the graph consists of measurement data every 3 minutes stored for up to 14 days. In this study we used this monitoring system in patients with diastolic heart failure.

Purpose: In our study we evaluated the non diabetic patients with HFpEF with Glunovo® to evaluate the glycaemic variability in this population

Methods:100 patients with HFpEF admitted to cardiology units of 4 Italian centres on the major islands were enrolled consecutively. Glunovo® was applied to each enrolled patient for 7 days, taking a total of 3360 punctual glucose measurements for each patient in the abdominal interstitial fluid. The HFpEF diagnosis required three obligatory conditions had to be simultaneously satisfied: presence of signs or symptoms of congestive heart failure; presence left ventricular systolic function >55%; evidence of abnormal relaxation pattern of transmitral flow and an increased E/E' ratio in tissue doppler of lateral left ventricular wall. At the end of the glycaemic monitoring, for each patient the glycaemic variability and the incidence of hyperglycaemia and hypoglycaemia were calculated. Glycaemic variability refers to a blood glucose value of ≥200 mg/dL or ≤59 mg/dL detected more than 3 times in a day for at least 4 days. The inclusion criterion was the presence of diastolic heart failure while the only exclusion criterion was the presence of diabetes diagnosis. Overall, 43 males and 57 females were enrolled with a mean age of 69.3 years (39-87 years). All patients underwent a timely glucose measurement at admission which excluded the presence of hyperglycaemia. No potentially hyperglycaemic drugs were added to the treatment during the hospital stay. Continuous glucose monitoring was performed as an integral part of the hospitalization diagnostic routine.

Results: In 94 of the 100 patients enrolled it was possible to conclude the analysis, detecting the glycaemic variability, the point glycaemia values and the estimated glycated haemoglobin value. A glycaemia ≥200 mg/dL was found in 53 patients (56%) while a high glycaemic variability was found in 51 patients (54%). A blood glucose value <59 mg / dl was found in 48 patients (51%). Only 5 times the estimated glycated HbA_{1c} values were >7%. 32 of the patients who had at least 3 punctual glucose values ≥200 mg/dL were prescribed an oral glucose load curve, which in 100% of cases confirmed the diagnosis of diabetes. No statistically significant differences were found based on age group or sex. In the control group, consisting of 10 patients without DHF undergoing continuous glucose monitoring at one of the participating cardiology units, an unknown hyperglycaemia was found in only 1 patient (10%) and a glycaemic variability in only 1 patient (10%).

Conclusions: Our experience suggests an incidence of hyperglycaemia and glycaemic variability more then 65% in patients affected by HFpEF. If

our data were reproducible on a large scale, such a high prevalence of diabetes in patients with HFpEF cold explain the efficacy of SGLT-2 inhibitors and GLP1 receptor agonists in this class of patients.

OC24

Can CGM improve management of patients hospitalized? Evaluation from a department case study

M. Conti[1], G. Vella[2], M. Renda[1] | [1]Fondazione Istituto G.Giglio Cefalù | [2]UNIPA Palermo, Italy

Introduction: To compare diabetes metrics in patients hospitalized in internal medicine for acute respiratory or septic event between those who used traditional glycemic monitoring (DTX) or continuous glucose monitoring (CGM).

Methods: Retrospective study of a cohort of 180 patients hospitalized between April- December 2023, 90 of whom were monitored using CGM and comparison of their glycemic parameters with other 90 patients with a similar admission diagnosis who were monitored using DTX. In the CGM group, we evaluated mean glycemia (MBG), standard deviation (SD) of MBG, glycemic coefficient of variabi-lity (CV), time in range (TIR% 70-180 mg/dL), time above range (TAR% >180 mg/dL), and time below range (TBR% <70 mg%). In the DTX group, we evaluated MBG as the mean of daily glycemic values (on average 4.5 DTX samples/day), CV as SD/MBG, TIR as % of DTX values between 70-180 mg/dL, TAR as % of DTX >180 mg/dL, and TBR as a % of DTX <70 mg/dL. An additional analysis was conducted on a subgroup of 16 patients, comparing their metrics before and after transitioning from DTX to CGM to further understand the impact of CGM on glycemic control within the same individuals.

Results: Levene's test suggested homogeneity of variances for most of the metrics, with p- values >0.05, indicative of no significant variability discrepancy, except for TBR. T-test unveiled substantial disparities between the groups: MBG demonstrated a significant mean diffe-rence ($p < 0.05$), underscoring a substantial divergence in average blood glucose levels. Other parameters, including CV, TIR, and TAR, also manifested statistically significant differences. The subgroup analysis of 16 patients revealed a decrease in mean glycemia from 206.87 to 177.00 mg/dL (14.44% reduction), a decrease in SD from 63.13 to 47.69 mg/dL (24.47% reduction), a decrease in CV from 31.10% to 26.87% (13.61% reduction), an increase in TIR from 38.54% to 56.31% (46.12% increase), a decrease in TAR from 57.24% to 43.38% (24.22% reduction), and a drastic decrease in TBR from 4.22% to 0.31% (92.59% reduction), highlighting significant improvements in glycemic control with the use of CGM.

Conclusion: Our experience highlights a significant difference of glycemic metrics between CGM and DTX patients, with the former improving TIR, TBR, and CV. The additional analysis of a subgroup of patients compared with themselves before and after transitioning to CGM further emphasizes the benefits of CGM in acute setting.

OC25

A reduced kidney function is associated with a decrease in the structural integrity of the sciatic nerve in individuals with type 1 and type 2 diabetes

C. Mooshage[1], L. Seebauer[2], M. Roshan[2], D. Tsilingiris[2], S. Heiland[1], S. Kopf[2], J. Szendroedi[2], M. Bendszus[1], F. Kurz[1], J. Jende[1], Z. Kender[2] | [1]Department of Neuroradiology, Heidelberg University Hospital, Germany | [2]Department of Endocrinology, Diabetology, Metabolic Diseases and Clinical Chemistry, Heidelberg University Hospital, Germany

Objective: The aim of our study was to investigate the correlation between the structural integrity of the sciatic nerve and renal function in individuals with type 1 diabetes (T1D) and type 2 diabetes (T2D).

Methods: 56 individuals with T2D (18 females, 38 males) and 14 individuals with T1D (8 females, 6 males) underwent detailed clinical, serological assessments, and MR-Neurography of the sciatic nerve. The diagnosis of DSPN was established if either 1. Neuropathy Disability Score (NDS) was >5 or 2. NDS >2 and Neuropathy Symptom Score (NSS) >3.

Results: Both GFR (DSPN: 82.2±14.9 ml/min/1.73 m²; nDSPN: 93.1±12.2; p=0.011) and fractional anisotropy (FA) of the sciatic nerve (DSPN: 0.40±0.05; nDSPN: 0.45±0.05; p=0.001) were reduced in individuals with T2D with DSPN compared to those without DSPN. No difference in the albumin-creatinine ratio was found between the group of individuals with T2D with and without DSPN. In individuals with T1D, FA of the sciatic nerve positively correlated with GFR (r=0.55, p=0.042). Furthermore, a partial correlation analysis controlled for age showed a positive correlation of FA of the sciatic nerve with GFR in individuals with T2D (r=0.29, p=0.034) as well as collectively in individuals with T1D and T2D (r=0.33, p=0.005).

Conclusions: In both individuals with T1D and T2D, a correlation between kidney function and FA as a marker for peripheral nerve damage can be demonstra-ted. Since individuals with severe kidney insufficiency were excluded from the study, the results suggest that synchronous damage to peripheral nerves and kidneys can be detected in individuals with diabetes even before the onset of diabetic nephropathy.

OC26

The biochemical mechanisms underlying (+)-lipoic acid in an in vitro model of liver steatosis: Lipotoxicity, mitochondrial homeostasis and oxidative stress

L. Longhitano[1], A. Distefano[1], D. Tibullo[1], G. Li Volti[1] | [1]Department of Biomedical and Biotechnological Sciences, University of Catania, Italy

Non-alcoholic fatty liver disease (NAFLD) is a liver disorder characterized by the accumulation of fat in hepatocytes without alcohol consumption. NAFLD can be caused by various factors, including obesity, high cholesterol, insulin resistance, and metabolic syndrome. The complex pathophysiological mechanisms include mitochondrial dysfunction, endoplasmic reticulum (ER) stress and oxidative stress. The aim of the present study was to investigate the effects of lipoic acid, a known antioxidant and prosthetic group of the pyruvate dehydrogenase complex, on lipotoxicity, mitochondrial dynamics, UPRmt, inflammation, and oxidative stress in an in vitro model of NAFLD

using HepG2 cells treated with palmitic acid and oleic acid. Treatment with palmitic and oleic acids induced lipotoxicity and ER stress, evidenced by increased lipid droplets accumulation, mitochondrial fragmentation, and upregulation of ER stress markers. However, lipoic acid treatment at concentrations of 1 µM and 5 µM for 48h attenuated these effects. Interestingly, lipoic acid restored mitochondrial membrane potential, protected against mitochondrial fragmentation, and enhanced the expression of mitochondrial fusion genes while reducing the expression of mitochondrial fission genes. Moreover, lipoic acid treatment mitigated ER stress by restoring UPRmt-related protein levels and decreased oxidative stress by modulating the expression of antioxidant enzymes and increasing glutathione levels. In conclusion, lipoic acid demonstrates promising effects in reducing lipotoxicity, improving mitochondrial functions, ameliorating ER stress, reducing oxidative stress and thus representing a pharmacological tool of patients with metabolic syndrome and NAFLD.

OC27

Development of an innovative animal model for cardiometabolic risk factors associated ischemic heart disease

S. M. Satyam[1], L. K. Bairy[1], A. Rehman[2], T. Densil[1], S. F. Fathima[1], R. F. Harid[1] | [1]Pharmacology- RAKCOMS, RAKMHSU Ras Al Khaimah, UAE | [2]Pathology- RAKCOMS, RAKMHSU Ras Al Khaimah, UAE

Background: This study aimed to develop an innovative animal model to comprehensively investigate cardiometabolic risk factors associated with ischemic heart disease. The focus was on post-menopausal status, high-fat diet-induced obesity, and type 2 diabetes mellitus, integrating these factors into a unified animal model.

Method: Twenty young nulliparous female Wistar rats were divided into two groups (n=10/group): normal healthy control and toxic control. The experiment involved four phases: ovariectomy (reflecting post-menopausal state), induction of obesity using a high-fat diet, induction of type 2 diabetes mellitus, and development of ischemic heart disease. The rats underwent surgical procedures, dietary interventions, and induced diabetes using streptozotocin and nicotinamide. The development of ischemic heart disease was monitored through routine electrocardiogram (ECG) and blood pressure recording, oral glucose tolerance tests, and biochemical estimations of lipid profile, troponin-T, and NT-pro-BNP using enzyme linked immunosorbent assay (ELISA) method.

Results: The toxic control group, representing post-menopausal, obese, and diabetic conditions, showed a significant increase ($p \leq 0.05$) in body weight, impaired oral glucose tolerance at different time intervals, elevated blood pressure, and ECG variations compared to the normal healthy control group. These findings validate the successful integration of cardiometabolic risk factors in the animal model.

Conclusion: The established animal model provides a holistic approach for investigating the collective impact of post-menopause, high-fat diet-induced obesity, and type 2 diabetes mellitus on ischemic heart disease. The observed cardiometabolic changes in the toxic control group emphasize the relevance of this model in studying the intricate interplay of risk factors associated with cardiovascular disorders.

OC28

The potential benefits of semaglutide in the treatment of older patients with type 2 diabetes

K. Vukelic[1], M. Sabovic[2] | [1]Diabetes Department, Health Centre Grosuplje, Slovenia | [2]Medical Faculty, University of Ljubljana, Slovenia

Background: Sulfonylurea and insulins could be associated with adverse effects and poorer adherence in the elderly.

Objective: We aimed to determine whether administration of semaglutide reduces the need for sulfonylurea and/or insulin and improves control of T2D.

Methods: In this retrospective analysis, data from 34 elderly patients with inadequately controlled T2D treated with sulfonylurea and/or insulins in whom semaglutide was introduced were analysed. The baseline characteristics: 22 men/12 women, mean age 72 years, T2D duration 8.9 years, HbA_{1c} 8.4%, FBG 9,2 mmol/l, BW 98.8 kg, BMI 34.1 kg/m^2, SBP 153 mmHg, DBP 81 mmHg. 25 patients received sulfonylureas and 9 patients insulins. Patients were prescribed oral or subcutaneous semaglutide titrated to maximum tolerated dose. Primary endpoints: HbA_{1c} and FBG reduction, reduction in sulfonylurea and insulin dose. Secondary endpoints: changes in BW, BMI, SPB, DPB from day semaglutide treatment was started until last outpatient visit (mean treatment duration 16 months).

HbA_{1c} (1.5%; $p<0.0001$) and FBG (1.5 mmol/l; $p=0.0002$) were significantly reduced. In 7 patients sulfonylurea was discontinued, and in 16 it was reduced by at least 50%. Insulin dose was significantly reduced in all patients (by average of 22.5%, $p<0.01$). Cardio-metabolic risk factors were significantly reduced: BW (4.9 kg, $p<0.0001$), BMI (1.7 kg/m^2; $p<0.0001$), SBP (17.6 mmHg; $p<.0001$) and DBP (4.8 mmHg; $p=0.0009$).

Our real-world study suggests beneficial effects of semaglutide in elderly patients with inadequately controlled type 2 diabetes in terms of improving diabetes control and reducing the dose/consumption of sulfonylurea and insulin. All cardiometabolic risk factors were improved.

OC29

Weight loss and glycemic control in type 2 diabetic patients: A study on semaglutide and associated factors

T. Merghani[1], F. Hussein[2], R. Babiker[1], A. Qashllan[2], H. Prasad Goda[2], F. Bakheit[2], D. Parekh[2], Y. Altair[2] | [1]Physiology, RAKMHSU RAK, UAE | [2]Medicine, Ibrahim Bin Hamad Obaidullah Hospital RAK, UAE

Background: Semaglutide, a Glucagon-like peptide 1 agonist, offers benefits in diabetic patients, including weight reduction and improved glycemic control. However, factors influencing these outcomes warrant investigation.

Objectives: This study aimed to determine weight and hemoglobin A^{1c} ($Hb\,A_{1c}$) reductions in Emirati adult patients receiving semaglutide and to investigate potential associations.

Methods: Seventy-three adult diabetic patients (62% females) receiv-

ing weekly semaglutide injections were monitored in RAK, UAE. Weight and HbA_{1c} levels were assessed at baseline, three, and six months.

Results: A statistically significant reduction in Hb A1c levels was observed at three months (8.05 ± 1.88 to 7.37 ± 1.72, p < 0.001) and six months (8.05 ± 1.88 to 6.98 ± 1.59, p < 0.001), with a maximum reduction of 5.8% at six months. Weight reduction was also significant at three months (92.75 ± 21.63 to 90.01 ± 21.67, p < 0.001) and six months (92.75 ± 21.63 to 88.22 ± 21.25, p < 0.001), reaching a maximum reduction of 24 kg at six months. A significant positive correlation was found between HbA_{1c} reduction and age (p= 0.049), especially in those above 60 years. However, associations with gender or obesity were insignificant for both HbA_{1c} and weight reduction.

Conclusion: Semaglutide resulted in significant weight and HbA_{1c} reductions in Emirati diabetic patients. Age correlated with HbA_{1c} reduction, particularly the older age group, while gender and obesity showed no significant association. Further studies are needed to explore contribu-ting factors.

OC30

Association of serum uric acid and cardiac events in chronic kidney disease – a retrospective study in tertiary care center

R. Babiker[1], T. Hakim[1], H. Khammas[2], B. E. Zayed[2] | [1]Physiology Department Ras Alkhaima, UAE | [2]Nephrology and Dialysis Department Al-Fujairah, UAE

Background: Recent research has identified hyperuricemia (HU) as a potential risk factor for the onset of chronic kidney disease (CKD). However, its independent role as a risk factor for cardiovascular disease (CVD) in CKD patients remains inconsistent. This study aims to explore the varying effects of hyperuricemia on cardiac outcomes in individuals with CKD.

Objective: To investigate the relationship between hyperuricemia and cardiac manifestations in patients with CKD.

Methods: A retrospective observational study was conducted at Al-Fujairah Nephrology and Dialysis department, UAE, including 644 CKD patients' first visit records from 2016 to 2021. Both adult male and female patients diagnosed with CKD were included in the study. Ethical approval was obtained from the Ministry of Health (MOHAP/ DXB- REC/D.D-J/No. 138/2022) and RAKMHSU ethical committee.

Results: The study comprised 644 CKD patients with an average age of 68.2±16.7 years, including 388 males and 256 females. Uric acid demonstrated a positive correlation with BMI and LDL levels (p=0.01), along with a negative correlation with HDL (p=0.01). Hyperuricemia was more prevalent among obese patients with CKD (53.3%) compared to non-obese individuals (43.2%, p=0.018), and in females (54.5%) compared to males (41.0%, p=0.002). Hyperuricemia showed a significant association with cardiovascular complications in non- diabetic males (p=0.028) but not in females (p=0.427).

Conclusion: Hyperuricemia demonstrates varying associations with cardiovascular complications in CKD patients, with notable gender and obesity-related disparities. The study highlights the interplay of hyperuricemia with various risk factors, emphasizing the need of further exploration to refine cardiovascular risk assessment in CKD patients.

OC31

Safety monitoring of therapeutic interventions in patients with acute coronary syndrome

D. T. Wadhwa[1], A. Alam[1], E. Hassan[2] | [1]Clinical Pharmacy & Pharmacology Ras Al Khaimah, UAE | [2]Cardiology Northern Island, Northern Emirate

Background: Adverse drug reactions (ADRs) have been considered as the leading cause of morbidity and mortality worldwide. Presence of risk factors like multiple co-morbidities, polypharmacy, intercurrent disease, advanced age, concomitant drug therapy etc. may predispose patients to develop ADRs. Patients with cardiovascular diseases, receiving intensive drug therapy for the management, are more prone to experience ADRs.

Objectives: The main objective of the present study was to monitor the safety of drugs used in hospitalized patients with acute coronary syndrome (ACS). The specific objectives were to assess the incidence of ADRs, characterize ADRs in terms of individual drug implicated, organ system affected, and analyze ADRs for their causality, severity, preventability and predictability.

Methodology: This was a prospective observational study which was carried out in the cardiology ward of a secondary care hospital of the Northern Emirate. The present study included adult patients of either gender, diagnosed with acute coronary syndrome and hospitalized in the cardiology ward. Patients were monitored for the occurrence of ADRs from the day of admission till the day of discharge by attending ward rounds with specialist cardiologist, clinical meetings and using electronic medical records. The study data was recorded appropriately in the forms designed for the study purpose. Recorded ADRs were assessed for incidence, individual drug implicated, drug class implicated, suspected ADRs, organ system affected, management, treatment and outcome. In addition, ADRs were also analyzed for their causality, severity, preventability and predictability using standard assessment scales. Adverse drug reactions were also categorized on the basis of WHO recommended ATC/ DDD classification system. The study data was analyzed statistically using SPSS version 27.

Results: A total of 126 patients were enrolled in the present study. Out of 126, 105 patients developed 231 ADRs accounting for an overall incidence of 83.33%. Male preponderance was observed over female. Highest number of ADRs were observed within the age group 41 to 50 years. The most common drug class implicated in causing ADRs was observed to be anti-platelets (23.38%), especially aspirin (19.04%). Majority of patients experienced bradycardia (13.86%) followed by prolonged PT (11.25%). Most of the ADRs were categorized as type A (92.20%). Endocrine and metabolic system (25.54%) was observed to be the most affected organ system followed by cardiovascular (24.24%) and haematological (12.99%) system. Majority of ADRs were predictable (51.51%), possible (84.41%) in na-

ture, mild (96.97%) in severity and not preventable (77.92%). A positive correlation was observed with age, length of hospital stay, associated co-morbid conditions, total number of drugs and total number of ADRs.

Conclusion: The present study demonstrated high incidence of ADRs among hospitalized patients with ACS. Safety monitoring of therapeutic modalities among patients with ACS is of utmost importance in order to optimize drug treatment and rationalize therapeutic approach to ensure better pharmaceutical care.

Topic Area: Cardiovascular (Medication Safety)

OC32

Real-world efficacy of combination therapy with GLP1-RA and SGLT2i in type 2 diabetes subjects with inadequate glucose control

A. Milluzzo[1], G. Quaranta[1], T. Ballirò[2], F. Di Giacomo Barbagallo[1], G. Bosco[1], A. Di Pino[1], R. Scicali[1], S. Piro[1], L. Sciacca[1], L. Frittitta[1] | [1]University of Catania, Department of Clinical and Experimental Medicine Catania | [2]Garibaldi-Nesima Hospital, Diabetes and Obesity Center Catania, Italy

Introduction: Few evidence are available on the effect on glucose control of combination therapy with GLP1-RA and SGLT2i.

Aim: To assess the effectiveness on glucose control of contemporary treatment with GLP1-RA and SGLT2i in T2D subjects and to identify clinical predictors of HbA_{1c} reduction.

Methods: Retrospective analysis of T2D subjects treated with the combination of GLP1-RA and SGLT2i. We selected 300 subjects with inadequate glucose control (HbA_{1c} ≥7%) before the combination therapy and we analysed the changes in HbA_{1c} and clinical parameters during the following 6-12 months. Subjects were classified as responder or non-responder according to HbA_{1c} value (less than or more equal to 7%) during the follow-up.

Results: The mean age was 66.5±8.7 years, diabetes duration was 18.3±8.8 years, and more than half of them were obese. In 31.0% of subjects, the HbA_{1c} target was achieved during the follow-up. At baseline, the responder vs. non-responder group had a significantly lower diabetes duration (15.9±8.0 vs.19.4±9.0), HbA_{1c} (7.9±0.9 vs. 8.1±1.0), and prevalence of insulin use (41.9% vs. 63.1%), a higher eGFR (80.8±23.3 vs. 73.8±22.7), and a similar prevalence of vascular complications. During the follow-up, responders vs. non-responders had a significantly higher reduction of weight, HbA_{1c}, and a higher rate of insulin discontinuation (30.8% vs. 8.5%, $p<0.001$). The multivariate analysis confirmed the predictive value of diabetes duration, insulin use, and weight reduction on the occurrence of HbA_{1c} goal.

Conclusions: Diabetes duration, insulin use, and weight reduction during therapy could predict the response to combination therapy with GLP1-RA and SGLT2i.

OC33

Kumquat consumption mitigates neuronal damage induced by high-fat diet: Insights into mechanisms and implications

M. Giardina[1], S. Terzo[1], P. Calvi[2], M. Allegra[1], A. Massaro[1], L. Tesoriere[1], P. Picone[3], D. Nuzzo[3], F. Mulè[1], A. Amato[1] | [1]Department of Biological-Chemical-Pharmaceutical Science and Technology, University of Palermo, Italy | [2]Department of Biomedicine, Neuroscience and Advanced Diagnostic, University of Palermo, Italy | [3]Istituto per la Ricerca e l'Innovazione Biomedica (IRIB), CNR, Palermo, Italy

Introduction: Kumquat are small citrus fruits rich in flavonoids, phenolic compounds and essential oils, especially limonene, making them a health-promoting fruit. They are usually consumed in whole, including the peel, which enhances the intake of beneficial phytochemicals. In addition to its aroma, kumquat may have antiproliferative, anti-inflammatory, and antimicrobial effects; however, research on the effects of Kumquat consumption on neurological issues is limited.

Objective: This study aimed to investigate the effects and the mechanisms of action of Kumquat consumption on neuronal damage induced by a high-fat diet (HFD).

Methods: C57/B6J mice were divided into three different groups: STD fed standard diet, HFD fed HFD, and HFD+K fed 5% lyophilized kumquat HFD supplemented diet, for 24 weeks. Various parameters, such as brain atrophy, neurodegeneration, expression of pro- and anti-apoptotic factors, Alzheimer's disease pathways and central insulin resistance were analysed.

Results: The HFD mice exhibited reduced brain weight/body weight ratio, increased apoptotic nuclei in the cerebral cortex, elevated pro-apoptotic gene expression (Fas-L, Bim and P27) and decreased neuroprotective factor expression (BDNF and BCL2) compared to STD and HFD+K mice. Furthermore, genes associated with β-amyloid plaque generation, acetylcholine degradation and inflammation (Apba3, Apbb1, Apoe, Gnb2, Prkcd, Bche, and Clu) were downregulated in HFD+K compared to HFD. Additionally, kumquat consumption mitigated insulin resistance in the brain, as indicated by the improved Ins-R, pAKT, pGSK3B and pSer-IRS1 protein expression levels.

Conclusions: In conclusion, the present results suggest that Kumquat consumption counteracts neurodegeneration in obese mice, by regulating the critical molecules of insulin signalling pathways in the brain.

OC34

The influence of lipoprotein (a) levels on the diagnosis of familial hypercholesterolemia: Does it have an impact on clinical practice?

S. Singh Lukač[1], L. Popović[1], I. Rasulić[1], A. Petakov[1], M. Krstić[1], M. Mitrović[1], K. Lalić[1] | [1]Clinic for Endocrinology, Diabetes and Metabolic Diseases, University Clinical Center of Serbia, Belgrade, Serbia

Introductions and Objective: Diagnostic tools for familial hypercholesterolemia (FH) rely on LDL-ch, which contains a contribution of low-lipoprotein cholesterol (a) [Lp(a)]. The aim of our research was to assess how adjusting LDL-ch for Lp(a)-cholesterol affects FH diagnoses using Dutch Lipid Clinic Network (DLCN) criteria.

Methods: We retrospectively analyzed 331 patients with FH from our national registry. DLCN criteria were used for diagnosis of FH. Lipid parameters (total cholesterol-TC, HDL-ch, triglycerides) were determined by the enzymatic method, Lp(a) by immunoturbidimetric method, LDL-ch was cal-

culated using the Friedwald formula. Corrected LDL-ch for Lp(a)- cholesterol was calculated using the formula: LDL-h–0.3×Lp(a). DLCN criteria were applied before and after adjustment of LDL-h concentration.

Results: The results showed that of our 331 patients, 13.9% had definite FH, 16.3% probable, 37.3% possible, and 32.5% were healthy. After correcting LDL-ch for Lp(a), 8.5% had certain, 6.6% probable, 29.0 % possible FH and 55.9% were healthy. The proportion of patients in whom the diagnosis was reclassified was 36.5% in the group of patients with Lp(a) values over 0.3 g/L.

Conclusion: Results show that corrected LDL-ch based on the concentration of Lp(a) leads to a significant reclassification of diagnoses according to the DLCN criteria into less severe and reduces the probability of true FH. The use of Lp(a)-cholesterol-corrected LDL-ch plays an important role in assessing the achievement of LDL-ch target levels, especially in patients with elevated Lp(a) values. LDL-ch level corrected for Lp(a) should be considered when establishing the diagnosis of FH and achieving therapeutic goals.

OC35

Association between locus of control, quality of life, consciousness, impulsivity and glycemic control in adult patients with type 2 diabetes

L. A. Moldovan[1], I. Szabo[2] | [1]Diabetes Cluj Napoca | [2]Psychology Cluj Napoca Framework, Romania

Diabetes mellitus is a chronic and progressive disease with a significant clinical and social impact, due to an impaired quality of life, specific micro- and macro-vascular complications and with important costs of care. Glycemic control over the last 3 months is evaluated by HbA_{1C}. Studies have shown that psychology traits play an important role in adherence to chronic disease treatment and are often associated with obesity and eating behavior disorders. It has been proven that optimizing lifestyle - diet, physical exercise, avoiding toxic substances, sleep hygiene, adapting to stress - is effective in reducing the progression of diabetes.

Method: Observational study, including 73 type 2 diabetes adult outpatients from Cluj-Napoca, who signed their consent and completed Multidimensional Health Locus of Control, Barratt Impulsivity Scale, Quality of Life Index and Conscientiousness Dimension of the revised Personality Inventory. The information obtained was correlated with glycemic control, expressed by the HbA_{1C} value. SPSS 2 program was used for data analysis.

Results: HbA_{1c} vs. Internal locus of control = -.49, p<.001 HbA_{1c} vs. Conscientiousness = s -.51, p<.001 HbA_{1c} vs. Impulsivity = .53, p<.001 HbA_{1c} vs. Quality of life = -.27, p<.05

Conclusions:

- Locus of control, quality of life, impulsivity and conscientiousness may be useful in psychological assessment of diabetic patients.
- Identified variables that explain the most variance in HbA_{1c} could predict which patients will respond better to treatment.
- Based on these predictions, personalized intervention programs can be created to increase treatment compliance.

OC36

Lipoic acid and cocoa extract protect pancreatic beta cells from oxidative stress and restore insulin gene expression

G. Siragusa[1], L. Tomasello[1], M. Biondo[1], S. Sortino[2], M. Fiducia[2], C. Giordano[1], G. Pizzolanti[1] | [1]University of Palermo, Dept. PROMISE Palermo, Italy | [2]Nuova Farmaceutica Srl Carruba di Riposto, Italy

Introduction: Diabetes mellitus is a chronic metabolic disorder characterized by alterations in the metabolism of carbohydrates, proteins, and lipids. Although type 1 diabetes (T1D) and type 2 diabetes (T2D) are considered pathophysiologically distinct, both are characterized by apoptosis of pancreatic β-cells. In the presence of high levels of glucose, β-pancreatic cells increase insulin secretion and stimulate oxidative processes that glucose undergoes. At the same time, an increase in the production of superoxide occurs and promotes the propagation of oxidative stress which is detrimental to the cell.

Method: Since both lipoic acid and cocoa polyphenols have been shown to provide benefits in diabetic subjects, this study investigated the effects of the two compounds on an in vitro β-cell model.

Results: The results of the MTT assay established that the nutraceuticals do not compromise the cellular viability of the B-TC-6 pancreatic beta cell line. We mimicked a condition of oxidative stress by exposing the cells to hydrogen peroxide, and simultaneously treated the cells with the nutraceuticals. Lipoic acid restored the viability of pancreatic beta cells, protecting them from oxidative stress, as demonstrated by the cellular viability assay. Furthermore, the results of cytofluorimetric analysis, after staining with propidium iodide, established that it protected cells from apoptosis. Real Time PCR results established that the antiapoptotic genes such as BCL2, BCL-W, BCL-XL, FLIP and SURVIVIN were increased when treated with the nutraceuticals. Similarly, we found that the nutraceuticals enhanced the antioxidant defense system, by upregulating GPX1, PRDX1, PRDX3, PDIA1 and NRF2 genes, and restored insulin gene expression.

OC37

GDF-15 levels are not affected by liraglutide or naltrexone/bupropion administration

S. K. Konstantinidou[1], G. Argyrakopoulou[2], S. Simati[1], C. S. Mantzoros[3], K. Stefanakis[1], A. Kokkinos[1] | [1]First Department of Propaedeutic Internal Medicine and Diabetes Center, Medical School, National and Kapodistrian University of Athens, Laiko General Hospital Athens, Greece | [2]Diabetes and Obesity Unit, Athens Medical Center, Athens, Greece | [3]Department of Internal Medicine, Boston VA Healthcare system and Beth Israel Deaconess Medical Center, Harvard Medical School Boston, Massachussetts, USA

Introduction: The growth/differentiation factor 15 (GDF-15) has garnered attention for its ability to regulate body weight and as a potential pharmaceutical option to combat obesity. Although naturally occurring high levels of GDF-15 are found in various conditions, pharmacological GDF-15 levels in animals have been shown to reduce body weight.

The purpose of the current study was to examine the response of GDF-15 levels to anti-obesity drugs, i.e. liraglutide 3 mg and naltrexone/bupropion (N/B) in individuals with overweight or obesity.

Methods: The current trial, which lasted for six months, involved forty-two people with overweight or obesity, exclu-ding those with diabetes mellitus. Patients received 3 mg of liraglutide or 32/360 mg of N/B daily, alongside diet and exercise. Baseline, three-month, and six-month clinical and laboratory measurements were performed, as well as anthropometric measurements and body composition analysis. Blood samples were collected in the fasting state and at 30-minute intervals for three hours post-consumption of a standardized mixed meal.

Results: Upon evaluating all participants at baseline and at 3- and 6-month intervals, there were no significant changes observed in GDF-15 levels during the mixed meal vs. premeal levels. Subgroup analysis (liraglutide vs. N/B) and area under the curve (AUC) or incremental AUC (iAUC) values for GDF-15 levels between the treatment groups at baseline and at the follow-up months (months 3 and 6) revealed no statistically significant differences.

Conclusion: The levels of GDF-15 remain unchanged in patients with overweight or obesity, who undergo treatment with either liraglutide or N/B.

Keywords: GDF-15, naltrexone/bupropion, liraglutide, obesity

OC38

Predictive biomarkers of sarcopenic obesity in patients with type 2 diabetes

R. E. Soare[1], A. I. Braha[2], R. M. Bungau[3], D. V. Reurean Pintilei[4], A. M. Pantea Stoian[5], B. Timar[2] | [1]Department of Diabetes, "Pius Brinzeu" Emergency Hospital, Timisoara, Romania | [2]Second Department of Internal Medicine, "Victor Babes" University of Medicine and Pharmacy Timisoara, Romania | [3]Department of Diabetes, "Pius Brinzeu" Emergency Hospital Timisoara, Romania | [4]Department of Diabetes, Consultmed Medical Clinic Iasi | [5]Department of Diabetes, "Carol Davila" University of Medicine and Pharmacy Bucharest, Romania

Background and Aims: Sarcopenic obesity (SO) in patients with diabetes is caused by a severe imbalance between adipose tissue versus muscle mass and function, this syndrome being associated with increased functional decline, gait impairment, morbidity, and mortality. This study aimed to identify possible predictors of SO in patients with type 2 diabetes (T2D).

Material and method: In a cross-sectional, non-interventional study, 74 patients with T2D were screened for the presence of obesity and sarcopenia (using the walking speed, gait speed and 5x sit-stand tests). Mathematical modelling was used to identify SO biomarkers in T2D.

Results: The prevalence of SO was 51.4%, while sarcopenia was present in 70.4% of obese T2D patients. The pre-sence of SO was associated with a higher age (67 vs. 61 years; p=0.010), total body fat (39.1 vs. 33.3%; p<0.001), arm fat (45.3 vs. 31.3%; p<0.001) and leg fat (46.2 vs. 31.0%; p<0.001) respectively with a lower mean hand grip strength (17.12 vs. 22.15 kg; p=0.005). Trunk (p=0.449), arm (p=0.256), leg fat free mass (p=0.808) and waist to hip ratio (p=0.438) were not associated with SO. The multivariate logistic regression and ROC analysis identified that age (exp(b)=1.075), mean arm fat (exp(b)=1.229), female gender (exp(b)=100.12) and mean grip strength (exp(b)=0.862; AUROC=0.692; Youden =0.406 for 19.62kg, corresponding to a sensitivity=0.72 and a specificity=0.68) are valid predictors for SO.

Conclusions: SO is found in approximately half of the patients with T2D. Hand grip strength may be a useful tool in screening SO in patients with T2D.

OC39

Factors associated with different cardiovascular risk classifications between 2023 vs 2021 guidelines in patients with type 2 diabetes living in a very high cardiovascular risk european region

R. M. Bungau[1], S. A. Luca[2], R. E. Soare[1], D. V. Reurean Pintilei[3], A. M. Pantea Stoian[4], B. Timar[5] | [1]Department of Diabetes, "Pius Brinzeu" Emergency Hospital Timisoara, Romania | [2]Department of Cardiology, "Victor Babes" University of Medicine and Pharmacy Timisoara, Romania | [3]Department of Diabetes, Consultmed Medical Center Iasi, Romania | [4]Department of Diabetes, "Carol Davila" University of Medicine and Pharmacy Bucharest, Romania | [5]Second Department of Internal Medicine, "Victor Babes" University of Medicine and Pharmacy Timisoara, Romania

Background and aims: The newest cardiovascular risk classification (2023) of the European Society of Cardiology for the management of diabetic patients changed the previously used methods for cardiovascular risk assessment. This study aimed to evaluate the differences between the 2023 vs. 2021 methods and which factors are associated with these different classifications in a very high cardiovascular European region.

Material and methods: In a single-center, cross-sectional study, 70 hospitalized patients with type 2 diabetes were enrolled. The 2023 vs. 2021 cardiovascular risk classifications were compared as well as assessment of which characteristics classified patients differently. Multivariate regression models were built to assess predictors for different classification between the two methods.

Results: In the studied group, 36 patients (51.4%) were classified differently in 2023 vs. 2021 (1.4% had a one-step decrease and 50.0% had a one-step increase in cardiovascular risk categories). An identical cardiovascular risk classification was associated with a higher rate of retinopathy (50% vs. 27.8%; p=0.048) and hypertension (97.1% vs. 77.8%; p=0.028) as well as lower total cholesterol (154.9 mg/dL vs. 184.1 mg/dL; p=0.034), non-HDLc (107.9 mg/dL vs.140.1 mg/dL; p=0.020), triglycerides (158.9 mg/dL vs. 207.7 mg/dL; p=0.080) and HbA_{1c} (7.7% vs. 9.1%; p=0.006). In the adjusted multivariate regression model, HbA_{1c} (OR=1.39; p=0.015) and the absence of chronic kidney disease (OR=9.32; p=0.046) predicted the occurrence of different classification.

Conclusions: The 2021 classification method underestimated the cardiovascular risk in diabetic patients living in very high cardiovascular risk European regions, especially in patients without complications and with good lipid and glycemic control.

OC40

Effectiveness of GLP1-RAs on metabolic, hepatic and renal parameters according to sex, age and BMI

A. Muscarà[1], A. Giandalia[1], A. Cuttone[1], G. Squadrito[1], D. Cucinotta[1], G. T. Russo[1] | [1]Department of Clinical and Experimental Medicine, University of Messina, Italy

Aims: In this single-center observational study, we evaluated the effectiveness of GLP1-RAs on metabolic, hepatic and renal parameters according to sex, age and BMI in a cohort of type 2 diabetes (T2D) subjects treated for 2 years.

Materials and methods: Anamnestic, clinical and anthropometric data of 461 T2D subjects (59.4% men) were retrospectively analyzed. Metabolic, renal and hepatic indices were calculated at T0 and after 24 months of treatment with GLP1-RAs.

Results: T2D men and women enrolled in the study presented similar mean age (65 years), duration of disease (11 years) and glycemic control (HbA_{1c} 7,9%). BMI was higher in women (33.93 ± 6.61 kg/m^2) than in men (31.56 ± 5.38 kg/m^2). TGL/HDL-c ratio (4.28 ± 2.67 vs 3.32 ± 1.73 p<0.01) and TyG (9.39 ± 0.58 vs. 9.27 ± 0.47 p=0.03) were higher in men. FLI values were similar in the two sexes. CVD, albuminuria and diabetic nephro-pathy (DKD) were more frequent among men. GLP1-RAs determined a significant improvement in metabolic parameters and glycaemic control, insulin-resistance indices and FLI in both sexes irrespective of age. Benefits on anthropometric parameters and FLI were more pronounced in obese subjects, without gender differences. DKD markers improved more in younger male patients. The improvement in TGL/HDL-c ratio and TyG were significant in the severely obese women only.

Conclusion: GLP-1RA treatment resulted in benefits on BMI, glycemic control, markers of hepatic steatosis and insulin resistance, with some differences according to age, sex and BMI.

OC41

Investigating the role of TSC22D1 in pancreatic beta cells

S. Yildirim[1], S. Lösch[1], S. Herzig[1], J. Szendrödi[1], B. Ekim[1] | [1]Heidelberg University Hospital, Department of Endocrinology and Clinical Chemistry, Joint Heidelberg-IDC Translational Diabetes Program Heidelberg, Germany

Background and Aim: Loss of beta cell function leads to chronically high blood glucose levels, contributing to both type 1 and type 2 diabetes. Understanding and improving beta cell function could lead to development of novel anti-diabetic treatments. Hence, in this study, we investigate the function of evolutionarily conserved TSC22D1 protein in controlling beta cell function.

Methods: We performed siRNA-mediated TSC22D1 knockdown (KD) experiments in Ins1e cells followed by qPCR analysis of beta cell identity genes as well as high throughput RNA-sequencing. Additionally, we performed glucose stimulated insulin secretion (GSIS) assay that involved 1 h starvation of cells in Krebs Ringer buffer followed by 1 h stimulation with 2 mM or 20 mM glucose. Finally, we performed co-immunoprecipitation experiments for a further mechanistic insight.

Results: TSC22D1 KD caused 2-fold increase in insulin gene expression as well as beta cell identity genes Pdx1, Glut2 and Nkx6-.1 (n=3, each with triplicates; p<0.05). TSC22D1 KD also elevated insulin secretion 2-fold in GSIS assay (n=3, each with triplicates; p<0.05). The RNA- seq experiment indicated that TSC22D1 KD caused most significant changes in protein processing pathways in the endoplasmic reticulum. Mechanistically, we identified that TSC22D1 interacts with transcription factor FoxO1.

Conclusion: Overall, TSC22D1 might be regulating insulin synthesis/secretion by interacting with FoxO1 to control the expression of beta cell identity genes as well as genes that regulate endoplasmic reticulum function. We believe, our findings contribute to a better understanding of the pathogenesis of diabetes, which might pave the way to development of novel therapies.

OC42

Clusterization of patients with type 1 diabetes mellitus based on continuous glucose monitoring data

A. Luganceva[1], S. Kistkins[2], S. Lobanovs[1], T. Mihailovs[3], E. Syundyukov[4], H. Sourij[5], O. Moser[6], D. Bļiznuks[3], V. Pīrāgs[7] | [1]Research Institute of Pauls Stradins Clinical University Hospital; Faculty of Medicine, University of Latvia, Riga, Latvia | [2]Research Institute of Pauls Stradins Clinical University Hospital; Faculty of Medicine, University of Latvia; Institute of Smart Computing Technologies, Riga Technical University, Riga, Latvia | [3]Institute of Smart Computing Technologies, Riga Technical University, Riga, Latvia | [4]Faculty of Medicine, University of Latvia, Riga, Latvia | [5]Interdisciplinary Metabolic Medicine Trials Unit, Division of Endocrinology and Diabetology, Medical University of Graz, Austria | [6]Division of Exercise Physiology and Metabolism, Institute of Sport Science, University of Bayreuth, Bayreuth, Germany; Interdisciplinary Metabolic Medicine Trials Unit, Division of Endocrinology and Diabetology, Medical University of Graz, Austria | [7]Research Institute of Pauls Stradins Clinical University Hospital, Riga, Latvia; Faculty of Medicine, University of Latvia, Riga, Latvia

Background: Recent studies have demonstrated the possibility of refining diagnostic and treatment strategies by enhancing the clustering of CGM data beyond variability and time-in-range metrics proposing a new research avenue in correlation of newly-developed clusters with clinical markers.

Methods: A 2-week CGM profile of T1DM patients obtained from the Interdisciplinary Metabolic Medicine Trials Unit at the Medical University of Graz, Austria (N=51) were categorised, utilising data-driven cluster analysis, employing 'UMAP' dimension reduction followed by K-means clustering.

Results: In total 6 clusters of diabetes patients were identified. Cluster 1 re-presents a "normoglycemic" cluster with the mean glucose level 7,88mmol/L (SD 2,45 mmol/L, TIR 79%). Cluster 2 ("hyperglycemic") had the highest mean glucose level (mean 10,92 mmol/L, SD 4,19 mmol/L, TAR 55%). Cluster 3 ("normohyperglycemic") had higher mean glycemia (mean 8,18 mmol/L, SD 3,28 mmol/L, TIR 67%, TAR 26%, TBR 7%), than Cluster 1, while Cluster 4 ("hypernormoglycemic") had lower mean glycemia (mean 9,29 mmol/L, SD 3,99 mmol/L, TIR 55 %, TAR 39%, TBR 7%) than Cluster 2. Cluster 5 ("normohypoglycemic") had the lowest mean value (mean 7,47 mmol/L, SD 3,30 mmol/L, TIR 69%, TBR 11%) among diabetic clusters. Cluster 6 ("hypohyperglycemic") exhibited the highest coefficient of variation (CV - 53%, mean 11,23 mmol/L, SD 5,96 mmol/L, TAR 52%, TBR 9%).

Conclusion: CGM-based clusterization has the potential to enhance individualized T1DM treatment plans.

Acknowledgements. We acknowledge the support of the Latvian State Research Programme project (No. VPP-EM-BIOMEDICĪNA-2022/1-0001). CGM data were obtained within the COVAC-DM study (KLIF-1076 to HS).

OC43

The effects of semaglutide vs testosterone replacement therapy on functional hypogonadism and sperm quality in men with type 2 diabetes mellitus and obesity

N. Gregorič[1], J. Šikonja[1], A. Janež[1], M. Jensterle Sever[1] | [1]Department of Endocrinology, Diabetes and Metabolic Diseases, University Medical Centre Ljubljana, Slovenia

Introduction: Diabetes and obesity cause functional hypogonadism (FH) and impair sperm quality. Testosterone replacement therapy (TRT) improves signs and symptoms of FH but further impairs spermatogenesis. The effect of GLP-1 receptor agonists on FH is suggested to be beneficial due to weight loss but its impact on sperm quality is to be determined.

Methods: A randomized open-label trial that included 25 men with type 2 diabetes, obesity and FH. Participants were randomized to semaglutide (SEMA) 1 mg/week or intramuscular testosterone undecanoate (TESTO) 1000 mg. At baseline and 24 weeks anthropometric parameters, FH parameters and seminal fluid analysis were assessed. Participants completed questionnaires of the International Index of Erectile Function-15 (IIEF-15) and the Aging Symptoms in Men (AMS).

Results: SEMA and TESTO groups, both increased total testosterone and improved AMS score. IIEF-15 score significantly improved only in TESTO group. In the SEMA group, there was a significant increase in morphologically normal sperm (0.07 [0.03; 0.22] 106/ejaculate vs. 0.88 [0.22; 1.91] 106/ejaculate; p=0.008). Sperm concentration, sperm count and number of mobile sperm decreased significantly in TESTO group. The groups differed significantly in sperm concentration (SEMA 19 [-45; 57]% vs. TESTO -67 [-88; -54]%; p=0.002), sperm count (SEMA -5 [-2; 71]% vs. TESTO -59 [-87; -50]%; p=0.026), and in number of morphologically normal sperm (SEMA 757 [296; 1253]% vs. TESTO 83 [-67; 215]%; p=0.022). Significant weight loss (baseline 115 [102; 120] kg vs. 24-week 99 [96; 118] kg; p=0.004) was achieved only in SEMA group.

Conclusion: Semaglutide, in comparison to TRT, was superior in improving body weight and sperm quality and comparable in increasing testosterone along with improving AMS score.

OC44

Analysis of potential risk factors for developing cardiovascular disease in patients with type 1 diabetes and diabetic ketoacidosis

I. Babic[1], A. Jotic[2], K. Lalic[2], J. Bogdanovic[2], L. Lukic[2], T. Milicic[2], M. Macesic[2], J. Stanarcic Gajovic[2], M. Stoiljkovic[2], D. Popovic[1], N. M. Lalic[2] | [1]Clinic for endocrinology, diabetes and metabolic diseases University Clinical Centre of Serbia, Belgrade, Serbia | [2]Clinic for endocrinology, diabetes and metabolic diseases, University Clinical Centre of Serbia; Faculty of Medicine University of Belgrade, Serbia

Background: Diabetes ketoacidosis (DKA) is the state of absolute insulin deficiency potentiated by acute lipotoxicity. Acute hyperglycemia affects myocardial function and increases the risk of cardiovascular disease (CVD). Mechanisms through which CVD risk is mediated in type 1 diabetes (T1D), remain somewhat controversial.

Aim: Our aim was to analyse potential risk factors for developing CVD in patients with DKA and T1D.

Patients and methods: A retrospective observational study was conducted, including 65 patients with DKA and T1D without previous CV event. CVD risk was assessed using the Steno type 1 risk engine (ST1RE), developed at Steno Diabetes Center Copenhagen. Following categorization of CVD risk, patients were divided into groups A (low risk, n=32), B (medium risk, n=23), and C (high risk, n =10). Demographic and clinical data, including triglyceride-glucose index (TygI), visceral adiposity index (VAI) and Castelli risk index-I (CRI-I) were obtained.

Results: There was significant difference between groups regarding diabetes duration (4.6±1.1years vs. 7.8±2.8years vs. 10.1±3.7years, p=0.04), waist circumference (81.2±4.3cm vs. 84.1±5.2cm vs. 87.1±4.4cm, p<0.05), WHtR (0.47±0.07 vs. 0.49±0.05 vs. 0.50±0.1, p=0.045), TC (6.2±2.1mmol/L vs. 6.5±1.2mmol/L vs. 6.8±2.1, p<0.05), Tgc (7.2±2.2mmol/L vs. 7.5±1.6mmol/L vs. 7.6±1.1, p<0.05), TygI (5.4±1.2 vs. 5.6±1.1 vs. 5.7±0.8, p<0.05), VAI (15.1±4.3 vs. 16.2±3.8 vs. 16.8±3.1, p<0.05), and CRI-I (8.6±1.3 vs. 10.7±2.2 vs. 11.7±1.9, p<0.05). Multivariable regression analysis showed TygI, VAI and CRI-I were independently associated with high CVD risk.

Conclusion: Our results imply that novel lipid indices, including visceral adiposity, may be useful tools for early detection of increased CVD risk in patients with T1D.

Key words: diabetes ketoacidosis, cardiovascular risk, dyslipidemia