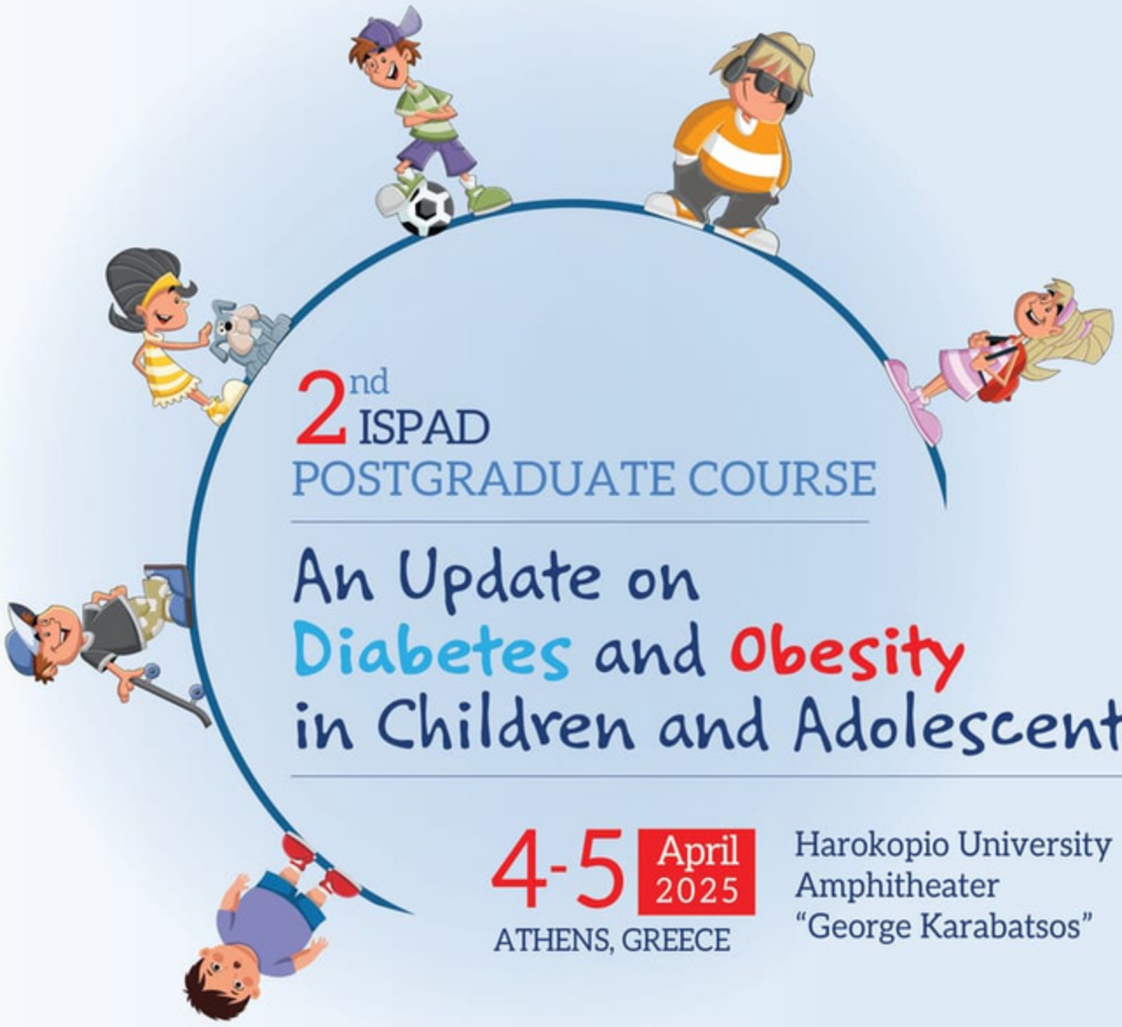
Organized by

ATHENS MEDICAL GROUP
Paediatric Center of Athens

In cooperation with

HAROKOPIO UNIVERSITY
POSTGRADUATE PROGRAMME
"APPLIED NUTRITION & DIETETICS"



2nd ISPAD POSTGRADUATE COURSE

An Update on Diabetes and Obesity in Children and Adolescents

4-5 April 2025
ATHENS, GREECE

Harokopio University
Amphitheater
"George Karabatsos"

Under the auspices of

ISPAD
International Society for Pediatric and Adolescent Diabetes

HELLENIC SOCIETY OF PEDIATRIC AND ADOLESCENT ENDOCRINOLOGY

ΕΛΛΗΝΙΚΗ ΔΙΑΒΗΤΟΛΟΓΙΚΗ ΕΤΑΙΡΕΙΑ
HELLENIC DIABETES ASSOCIATION

ABSTRACTS

Exercise and Type 1 Diabetes Mellitus

Stavros Liatis

Internal Medicine Specialist – Diabetologist, Greece

Abstract

Regular exercise in type 1 diabetes (T1D) improves insulin sensitivity, enhances glucose control, reduces cardiovascular risk, and supports overall well-being, but requires careful monitoring to prevent hypoglycemia. Due to complex physiology, maintaining glycemic control during exercise in T1D presents many challenges, including variable pre-exercise glucose levels, intra- and inter-individual differences in muscle glucose disposal, fluctuating insulin sensitivity, glucose monitoring limitations, fear of hypoglycemia, and varying patient education and motivation levels. Key strategies to prevent exercise-associated hypoglycemia include frequent glucose monitoring, reducing pre-exercise meal boluses, adjusting basal insulin if on a pump, and consuming carbohydrates as needed. In some cases, additional insulin may be required to prevent hyperglycemic peaks during high-intensity anaerobic exercise. Generally, physical activity should be avoided in cases of hypoglycemia or marked hyperglycemia with ketonemia.

The Role of Digital Technology and Artificial Intelligence in the Prevention and Management of Childhood Obesity

Evangelia Charmandari

MD, MSc, PhD, MRCP(UK), CCST(UK), Professor of Pediatrics, Pediatric and Adolescent Endocrinology, National and Kapodistrian University of Athens Medical School, President, Hellenic Society for Pediatric and Adolescent Endocrinology, Director, MSc Program «General and Pediatric Subspecialties: Clinical Practice and Research», Chair, ESPE Rare Disease Advisory Committee (RDAC), Member of ENDO-ERN Steering Committee

Abstract

Obesity in childhood and adolescence represents a major health problem. Novel e-Health technologies have been developed to provide a comprehensive and personalized plan of action for the prevention and management of overweight and obesity in childhood and adolescence. Intelligent multi-level information systems and specialized artificial intelligence algorithms have been developed with a view to offering precision and personalized medical management to children with overweight or obesity. Furthermore, Big Data against Childhood Obesity platforms record behavioral data objectively by using inertial sensors and Global Positioning System and combine them with data of the environment, in order to assess the full contextual framework that is associated with increased BMI. These advances in digital technology and artificial intelligence are expected to address more effectively the epidemic of childhood obesity.

A Short History of Insulin Delivery: Guesswork to AI

Stephen Greene

Professor of Child and Adolescent Health, Former President of the International Society Pediatric & Adolescent Diabetes (ISPAD), Consultant Pediatric Endocrinologist & Diabetologist, London Diabetes Centre by BUPA

Abstract

This presentation chronicles the evolution of insulin injection, underlining contributions in the preceding centuries from many, including Bernard, Minkowski, Zeuler and Banting & Best. The first human trial in 1922, despite initial challenges, marked a turning point. Subsequent advancements, originating from Collip's purification techniques, moved through basic syringes to insulin pens and pumps, with improved safety and precision. While dosage standardisation, hypoglycaemia and accessibility posed persistent challenges, technological innovations gradually addressed these issues. Cutting-edge technologies, such as AID and AI-powered implantable devices, potentially offer unprecedented control, over one hundred years after the first injection of insulin into a human.

Additional Therapy to Insulin at Diagnosis of Diabetes in the Young

Stephen Greene

Professor of Child and Adolescent Health, Former President of the International Society Pediatric & Adolescent Diabetes (ISPAD), Consultant Pediatric Endocrinologist & Diabetologist, London Diabetes Centre by BUPA

Abstract

This presentation explores therapeutic strategies beyond insulin for managing diabetes in young individuals, focusing on type 1 diabetes (T1D), addressing its heterogeneity and emphasising the roles of genetic and environmental factors in beta-cell stress and autoimmune responses. The presentation investigates methods for early intervention at diagnosis, including screening and risk assessment. It distinguishes between a 'cure' and 'amelioration', highlighting the importance of preserving beta-cell function and achieving normal physiology through optimised insulin therapy, potentially involving low doses, single daily injections, and advanced technologies like continuous glucose monitoring (CGM) and automated insulin delivery (AID) systems.

Glycemic control during pregnancy in type 1 diabetes mellitus

Emmanouil Souvatzoglou

Endocrinologist- Diabetologist, Head of Endocrinology Department, Athens Medical Center, Athens Medical Group, Greece

Abstract

Pregnancy in individuals with Type 1 Diabetes (T1D) requires careful management to ensure maternal and fetal health. Strict glycemic control before and during pregnancy minimizes risks such as congenital anomalies, preeclampsia, and preterm birth. Insulin analogs, continuous glucose monitoring, and a multidisciplinary care team are essential for optimal outcomes. The therapeutic target should align with normal carbohydrate metabolism. Potential complications include pregnancy-related events affecting both mother and offspring, as well as long-term health burdens. With proper planning and medical support, women with T1D can achieve healthy pregnancies and deliveries while minimizing adverse outcomes.

Obesity in Childhood and Adolescence: The Role of Pharmacotherapy

Feneli Karachaliou

Pediatric Endocrinologist, Unit of Pediatric Endocrinology, Diabetes and Metabolism, 3rd Department of Pediatrics, Attikon University Hospital, Athens, Greece

Abstract

Obesity is a chronic disease with serious comorbidities. The etiology of childhood obesity is multifaceted, involving a complex interplay of genetic and environmental factors. Lifestyle intervention remains the cornerstone of prevention/treatment but often has not durable effect due to biological mechanisms. Metabolic surgery is highly effective but targeted to adolescents with severe and complicated obesity. Pharmacotherapy is a useful additional tool to intensive lifestyle modification for the treatment of pediatric obesity for some patients, especially those with severe forms. Major advances have been made in the past few years in the development of pharmacotherapy for adolescents. Three large clinical trials have been conducted and have led to the approval of new treatment for adolescents. Important questions remain to be answered including long-term safety and effectiveness of pediatric pharmacotherapy, duration of treatment, maintenance of weight loss after discontinuation of treatment, identification of predictors of treatment response and characterization of successful responders to different treatments.

Where do we stand today with the prevention of type 1 diabetes?

Christina Kanaka-Gantenbein

Professor of Pediatrics-Pediatric Endocrinology, Director of the 1st Department of Pediatrics at the National and Kapodistrian University of Athens Medical School, Athens, Greece

Abstract

Type 1 Diabetes (T1D) is an autoimmune disease leading to hyperglycemia, due to the progressive autoimmune destruction of the insulin-producing beta cells of the pancreas. Overt T1D is manifested in a genetically predisposed individual when an environmental triggering factor has induced an "insulitis" stage, i.e. a state of inflammation of the beta cells of the pancreas. Insulitis is characterized by the presence of circulating T1D-specific autoantibodies in the patient's blood, such as islet cell antibodies (ICA), IA2 antibodies, anti-GAD antibodies and ZNT8 antibodies. Main triggering factors are several viral infections, with a prototype of congenital rubella, but also enteroviral infections, such as Coxsackie infections. During the Covid 19 pandemic it has become evident that an infection by the new SARS-CoV2 virus can also trigger the autoimmune destruction of the beta cells. Other triggers are dietary factors, such as cow milk, gliadin, a disturbed gut microbiota and even the birth of the child through cesarean section. Based on robust research data, it has been clarified that the presentation of overt Type 1 Diabetes is preceded by an earlier stage, where the individual is characterized by the presence of ≥2 auto-antibodies and normoglycemia (Stage 1 of Diabetes) followed by the Stage 2, when the individual presents with ≥2 auto-antibodies and dysglycemia- both stages characterized as pre-symptomatic stages of T1D- before the typical Stage 3 of symptomatic diabetes, when the individual demonstrates overt Diabetes with the typical clinical symptoms of polyuria, polydipsia, polyphagia and weight loss. Since overt Diabetes is quite often accompanied by Diabetes Ketoacidosis (DKA) and exhaustion of the beta cell reserve, several efforts have been applied worldwide to timely identify individuals at risk of developing T1D at the presymptomatic stage, to prevent DKA and therefore minimize the risk of long-term complications of the disease. Furthermore, the identification of patients at risk at the presymptomatic stage allows the application of disease-modifying therapies, such as immunotherapies, to significantly delay the presentation of T1D. International guidelines for the identification of individuals at risk at the presymptomatic stage will be presented as well as the several emerging pharmacological interventions implemented nowadays for the delay of the disease and their risk-benefit analysis.

Hypertension and inertia. Should we start treatment earlier?

Andriani Gerasimidou-Vazeou

Pediatrician & pediatric diabetologist, Chair of Pediatric Department and Diabetes Center, Aglaia Kyriakou Children's Hospital, Athens, Greece

Abstract

The prevalence of office hypertension is higher in adolescents with T1D than in children without diabetes. Screening for hypertension in children and adolescents with diabetes is mandatory for early diagnosis and treatment. In a study from the SWEET consortium it was shown that the proportion of individuals with hypertension who received treatment was very small (16%) suggesting that most individuals with office hypertension remain untreated. In the same study it was shown that 30% of children with type 1 diabetes have elevated BP or hypertension which is a modifiable cardiovascular risk factor, and its early diagnosis and treatment is of great importance for prevention of future cardiovascular events and improvement of life expectancy.

Advanced Hybrid Close Loop Systems: A head-tohead comparison of real-world data

Athanasios Christoforidis

Professor of Paediatrics – Paediatric Endocrinology, School of Medicine, Aristotle University of Thessaloniki, Greece

Abstract

Per the definition by the US FDA, real-world data (RWD) in the medical and healthcare field “are the data relating to patient health status and/or the delivery of health care routinely collected from a variety of sources”. Automated insulin delivery (AID) systems have transformed type-1 diabetes management by integrating continuous glucose monitoring (CGM) and insulin pumps to automatically adjust insulin delivery. RWD demonstrate that patients using AID systems achieve glycemic targets and significantly improve their quality of life. A head-to-head comparison of the available AID systems based on the latest RWD is provided in this lecture.

Closed loop in the very young

Carine de Beaufort

Former President and Secretary General of ISPAD, Consultant pediatric diabetes and endocrinology CHL (Luxembourg) Clinical researcher University of Luxembourg, Luxembourg

Abstract

Children below the age of 7 years who develop stage 3 type 1 diabetes, have always been a special population. Many age specific characteristics contribute to the complexity to meet treatment objectives, for example their unpredictable lifestyle, or the size of the injection sites. Hypoglycemia with potential neurocognitive impact has been feared by parents and professionals, leading to suboptimal metabolic outcomes. Today however, it is well documented that a suboptimal metabolic control does not prevent hypoglycemia, and that not only severe hypoglycemia, but hyperglycemia contributes at least as much to negative neurocognitive outcomes. Continuous subcutaneous insulin delivery has been used for 40 years and for parents, this was an initial life changer. Nowadays it has been clearly demonstrated, that the use of AIDs has far more impact. ISPAD Clinical Practice Consensus Guidelines 2022 (Sundberg et al) proposes the use of AIDs in this population, with studies providing evidence grade A on the beneficial outcomes. Since 2022, more data have been generated, confirming these results. Even if the initial cost may be higher, long term cost effectiveness should be considered with a expected positive outcome. Today the AIDs, approved for the target population, should be the treatment of choice from diagnosis onwards.

Microbiome and type 1 diabetes

Carine de Beaufort

Former President and Secretary General of ISPAD, Consultant pediatric diabetes and endocrinology CHL (Luxembourg) Clinical researcher University of Luxembourg, Luxembourg

Abstract

Humans and the microbiome have continued to evolve together over millenia. This colonization is of mutual benefit. The homeostasis with a relatively stable ecosystem will introduce a

o Highly adaptive metabolic engine

o Protection against potential pathogens

o Stimulation of the adaptive immune system

o Interaction of the innate immune system

The colonization of the GI tract starts at birth and is influenced by mode of delivery.

Over the last decennia, it has been questioned whether a link exists between the increase in different chronic and auto immune conditions and the microbiome. To evaluate a possible relationship, one needs to consider how data have been collected. To generate valid data in this domain, pre analytical standardization is essential to study the microbiome (Collection, Handling and Preservation of the biological specimen). Characterization of the communities in specific niches is needed as understanding the composition, function and variability in that specific niche, specific background, over time, with/out specific interfering external and host factors will help to improve our understanding. First interventions (although not new) in early onset stage 3 T1DM have been conducted in an adult study, comparing the impact of Fecal Microbiota Transplantation versus placebo in early stage 3 T1D. Further research will be needed to better understand the role of the microbiome in all stages of T1DM to appreciate its role in the pathogenesis or as potential therapeutic tool.

Hildebrand et al. Dispersal strategies shape persistence and evolution of human gut bacteria. Cell Host Microbe. 2021 Jul 14;29(7):1167-1176.e9. doi: 10.1016/j.chom.2021.05.008.

Wampach L, et al Birth mode is associated with earliest strain-conferred gut microbiome functions and immunostimulatory potential. Nat Commun. 2018 Nov 30;9(1):5091. doi: 10.1038/s41467-018-07631-x.

Busi SB, et al. Persistence of birth mode-dependent effects on gut microbiome composition, immune system stimulation and antimicrobial resistance during the first year of life. ISME Commun. 2021 Mar 26;1(1):8. doi: 10.1038/s43705-021-00003-5.

Czolk R, et al A. Fecal IgE Analyses Reveal a Role for Stratifying Peanut-Allergic Patients.J Investig Allergol Clin Immunol. 2024 Jul 26:0. doi: 10.18176/jiaci.1008.

de Groot P, et al Faecal microbiota transplantation halts progression of human new-onset type 1 diabetes in a randomised controlled trial. Gut. 2021 Jan;70(1):92-105. doi: 10.1136/gutjnl-2020-322630. Epub 2020 Oct 26. PMID: 33106354; PMCID: PMC7788262.

Tsenkova M et al. Ketogenic diet suppresses colorectal cancer through the gut microbiome long chain fatty acid stearate. Nat Commun. 2025 Feb 20;16(1):1792. doi: 10.1038/s41467-025-56678-0.

Use of Automated Insulin Delivery (AID) systems and Nutrition

Francesca Annan

Pediatric Diabetes Dietitian, UCLH, London, United Kingdom

Abstract

This presentation will review the role of nutrition education in people with diabetes using automated delivery systems. Evidence for the ongoing importance of nutrition counselling to reduce cardiovascular risk factors and support achieving glycemic outcome targets will be discussed.

Meal Frequency and timing: still relevant for diabetes control?

Aimilia Papakonstantinou, PhD

Associate Professor in Nutrition and Metabolism, Director of Laboratory of Dietetics and Quality of Life, Dept of Food Science and Human Nutrition, Agricultural University of Athens

Abstract

The management of diabetes has long emphasized macronutrient content and caloric restriction, yet growing evidence from clinical trials, observational studies, and mechanistic research suggests that *when* and *how often* we eat may be just as critical as *what* we eat. This talk critically evaluates the relevance of meal frequency and timing—collectively referred to as chrono-nutrition—as tools for glycemic control in both type 1 and type 2 diabetes (T1D and T2D), with a focus on the interaction between feeding schedules, circadian biology, and postprandial metabolism.

In T2D, consuming fewer, well-timed meals (typically 2–3/day) earlier in the day appears to confer metabolic advantages: improving HbA1c, reducing glycemic excursions, enhancing insulin sensitivity, and even resetting peripheral clock gene expression. Interventions emphasizing a calorie-rich breakfast, early time-restricted eating, or dinner avoidance have consistently shown superior glycemic outcomes compared to late-day eating or high meal frequency patterns—likely due to alignment with circadian rhythms and improved hormonal dynamics (e.g., insulin, GLP-1, ghrelin).

Conversely, data on higher meal frequency (5–6/day) remain equivocal. Some short-term studies suggest benefits in reducing glycemic variability and suppressing appetite, yet others show increased risk of overconsumption, postprandial lipemia, and disrupted circadian expression of metabolic genes. Long-term evidence in T2D remains mixed, often confounded by medication use and energy restriction. Nevertheless, a subset of patients—particularly those with early-stage glucose intolerance—may experience improved hunger regulation and glycemic control with more frequent, smaller meals. In T1D, where insulin dosing and timing are tightly coupled to food intake, regular meal patterns and breakfast consumption are associated with improved HbA1c. Yet, higher meal frequency may increase glucose variability, and pre-meal insulin administration remains a critical determinant of glycemic outcomes. Unlike in T2D, circadian alignment through timing alone may play a less prominent role than insulin precision and adherence. Importantly, timing of macronutrients matters: studies suggest carbohydrates are best tolerated at lunch, not breakfast or dinner, and high-fat or high-energy meals late in the day worsen next-morning glucose profiles and insulin resistance. These findings challenge traditional recommendations and suggest the need for personalized meal timing strategies, especially for those at risk of metabolic dysregulation. In conclusion, while there is no one-size-fits-all recommendation, evidence strongly supports the clinical relevance of meal timing and frequency in diabetes management. Aligning food intake with biological rhythms—prioritizing morning and midday meals, avoiding late-night eating, and considering the impact of meal frequency on hormonal and circadian signaling—represents a promising, non-pharmacologic strategy to improve outcomes in both T1D and T2D.

Diabetes Diet Dynamics: Harnessing Intermittent Fasting, Ketogenic Diets, and Holiday Fasts for People Living with Diabetes

Nancy Samir Elbarbary

MBBCh, MSc ,MD, PhD, Professor of Pediatric Diabetes, Faculty of Medicine, Ain Shams University, Cairo, Egypt, Consultant of Pediatric Diabetes, Chair of Diabetes Research and Diabetes Guidelines Committee of ASPED, Member of research and ethics committee at Ain Shams University hospitals, Cairo, Egypt

Abstract:

Nutrition therapy remains a cornerstone of diabetes management, yet individuals with type 1 diabetes mellitus (T1DM) continue to face challenges in achieving glycemic stability despite advancements in insulin formulations and glucose-monitoring technologies. This presentation explores the integration of alternative dietary approaches, such as intermittent fasting and ketogenic diets, into T1DM care, emphasizing their potential benefits—including reduced glycemic variability and insulin resistance—alongside critical risks such as diabetic ketoacidosis (DKA) and severe hypoglycemia. It provides evidence-based strategies for safe fasting practices, including adjustments to multiple daily injection (MDI) therapy through personalized basal and bolus insulin dosing, hydration protocols, and glucose monitoring to mitigate acute complications.

Additionally, the role of advanced hybrid closed-loop (AHCL) systems is highlighted, showcasing their ability to automate insulin delivery and improve time-in-range (TIR) during prolonged fasting periods. While these dietary interventions offer promising avenues for metabolic and cardiovascular health, their application in T1DM demands careful, individualized oversight to balance efficacy with safety.

The presentation underscores the importance of culturally sensitive patient education, interdisciplinary collaboration, and the integration of technology to support holistic, patient-centered care in the context of evolving dietary trends and therapeutic innovations.

Keywords: Type 1 diabetes, intermittent fasting, ketogenic diet, multiple daily injections, advanced hybrid closed-loop systems

Beyond Insulin: Can SGLT2 Inhibitors & GLP-1RAs Revolutionize Glycemic Control and Quality of Life in Type 1 Diabetes?

Nancy Samir Elbarbary

MBBCh, MSc ,MD, PhD, Professor of Pediatric Diabetes, Faculty of Medicine, Ain Shams University, Cairo, Egypt, Consultant of Pediatric Diabetes, Chair of Diabetes Research and Diabetes Guidelines Committee of ASPED, Member of research and ethics committee at Ain Shams University hospitals, Cairo, Egypt

Abstract

Type 1 diabetes mellitus (T1DM) management remains anchored in insulin therapy, yet persistent challenges—including glycemic variability, weight gain, and quality-of-life (QoL) burdens—underscore the need for adjunct therapies. Emerging evidence suggests that sodium-glucose cotransporter-2 inhibitors (SGLT2is) and glucagon-like peptide-1 receptor agonists (GLP-1RAs), traditionally used in type 2 diabetes, may offer transformative benefits in T1DM.

SGLT2is reduce hyperglycemia by promoting urinary glucose excretion, demonstrating HbA1c reductions of **0.3–0.5%** and improved time-in-range (TIR) by **1.5–2.5 hours/day** in trials, alongside weight loss (**2–4 kg**) and blood pressure benefits. However, their use is tempered by a heightened risk of diabetic ketoacidosis (DKD), requiring careful patient selection and monitoring.

GLP-1RAs enhance insulin secretion and suppress glucagon, achieving modest HbA1c reductions (**0.2–0.4%**) and significant weight loss (**4–6 kg**), with additional benefits in postprandial glucose stabilization. Patient-reported outcomes highlight improved treatment satisfaction and reduced hypoglycemia anxiety, key drivers of QoL.

Notably, combination approaches (e.g., SGLT2i + GLP-1RA) may amplify glycemic and metabolic advantages, though evidence remains limited. Challenges include regulatory restrictions (e.g., SGLT2is are not universally approved for T1DM) and individualized risk-benefit assessments.

In conclusion, SGLT2is and GLP-1RAs represent promising adjuncts to insulin, addressing unmet needs in T1DM through enhanced glucose stability, weight management, and QoL gains. However, their integration into clinical practice demands rigorous safety protocols, patient education, and further research to optimize long-term outcomes. This paradigm shift could redefine T1DM care, moving beyond insulin-centric strategies toward holistic, patient-centered management.

Keywords: Type 1 diabetes, SGLT2 inhibitors, GLP1RAs, glycemic control, quality of life, adjunct therapy.

From HbA1c to time in range (TIR) or do we need time in tight range (TITR)?

Ioanna Kosteria

Pediatric Endocrinologist – Diabetologist, Department of Endocrinology, Growth & Development "P&A Kyriakou" Children's Hospital Athens, Greece

Abstract

The DCCT/EDIC trial has established the importance of HbA1c not only as a measure of glycemic control but also as a predictor of macro and micro vascular complications of type 1 diabetes. The use of Continuous Glucose Monitoring devices, however, has provided a deep insight into glycemic variability that led to the introduction of new metrics of glycemia, including time in, above and below the range of 70-180 mg/dl. A target of >70% in time in range (TIR) was found to correspond to the currently proposed target of an HbA1c of 7% (53 mmol/mol), but also to be independently associated with the long-term complications of diabetes. Achieving these targets has been greatly facilitated by the progress in automated insulin delivery systems, making thus an even stricter target of glycemia within the normoglycemic range of 70-140 mg/dl seem feasible, yet still challenging, with data on the benefit of tighter glycemic control on glycemic and patient-reported outcomes still emerging. Recognizing the unique properties of older and new metrics and the added value of their combined use is a key concept in the management of type 1 diabetes.

Hypoglycemia management and fear of hypoglycemia

Nicolas Nicolaides MD, PhD

Pediatrician, Visiting Assistant Professor of Pediatrics, Medical School of University of Cyprus

Abstract

Hypoglycemia is a common acute complication of insulin therapy in children and adolescents with type 1 diabetes, and is defined as low plasma glucose concentrations causing symptoms and signs of autonomic activation and/or neurological dysfunction.

Importantly, severe hypoglycemia with cognitive impairment, such as convulsions and coma, may lead to decline in cognitive functions and persistent brain structural abnormalities; therefore, prevention and prompt recognition of clinical manifestations of hypoglycemia remain of great importance. Although several conditions have been recognized as precipitants or risk factors of low blood glucose concentrations, hypoglycemia still remains a limiting factor in achieving the optimum glycemic targets.

Indeed, fear of hypoglycemia (FOH) affects an ever-increasing number of children and adolescents who have experienced hypoglycemia, causing severe anxiety and unpleasant tension. Undoubtedly, the continuous and tremendous progress of diabetes technologies, including continuous glucose monitoring systems and sensor-augmented insulin pumps with predictive low glucose suspension, succeeded in reducing effectively the frequency of hypoglycemia events. Finally, a growing body of evidence suggests that artificial intelligence algorithms will contribute substantially to hypoglycemia prediction and detection.

Diabetic Ketoacidosis: Understanding and managing a critical complication in type 1 diabetes

Aristotle Panayiotopoulos

Pediatric Endocrinologist, Director of Pediatric Endocrinology, Athens Pediatric Center, Athens Medical Group, Greece

Abstract

Diabetic ketoacidosis (DKA) is a leading cause of morbidity and mortality in children with type 1 diabetes, often presenting at diagnosis or due to inadequate insulin therapy. This presentation reviews the unique pathophysiology, clinical manifestations, and risk factors of DKA in pediatric patients. We discuss evidence-based management, including fluid resuscitation, insulin administration, and electrolyte monitoring, with a focus on minimizing cerebral edema risk. Prevention strategies through patient education and technological advancements, such as continuous glucose monitoring, are highlighted. Early recognition and appropriate treatment are essential for improving outcomes in children with DKA.

Monogenic Diabetes: The Greek experience based on the data of the National Reference Center

Amalia Sertedaki, PhD

Division of Endocrinology, Diabetes and Metabolism, "Aghia Sophia» Children's Hospital ENDOERN Center for Rare Paediatric Endocrine Diseases, First Department of Pediatrics, Medical School, National and Kapodistrian University of Athens, "Aghia Sophia" Children's Hospital, Athens, Greece

Abstract

Monogenic Diabetes (MD) constitutes a genetically and clinically distinct group of diabetes mellitus (DM) that includes Maturity Onset Diabetes of the Young (MODY), Neonatal Diabetes Mellitus (NDM) and Syndromic DM.

MODY is the most frequent type of MD and is characterized by early onset hyperglycemia (typically before age 25 years), defect in β cell insulin secretion with minimal or no defects in insulin action, absence of islet autoantibodies and autosomal dominant inheritance. It is estimated to account for 1-5% of the diabetic population and it is often misclassified as Type 1 or Type 2 Diabetes. It is clinically and genetically heterogeneous and currently 14 genes have been identified, mutations of which are responsible for the 14 MODY subtypes that differ in pathogenesis of hyperglycemia, age of diabetes onset and treatment.

NDM, characterized by hyperglycemia within the first 6 months of life, is an extremely rare disorder primarily caused by mutations in >30 genes and exhibiting diverse clinical manifestations. Other subtypes of monogenic diabetes include multisystem syndromes (Wolfram Syndrome, mitochondrial Diabetes), severe insulin resistance, and lipodystrophy.

To date the development of DNA analysis technology and particularly the application of NGS, allowed us to study referrals with clinical suspicion of MD, increasing molecular diagnosis rates, reducing diagnostic time and cost and facilitating identification of the aetiologies of common and rare MODY subtypes as well as syndromic types of MD.

Achieving accurate genetic diagnosis of the MD type is of outmost importance for clinical diagnosis, disease progression prognosis, early intervention for comorbidities and family counseling. Most important, it guides appropriate treatment strategies, since different MD types require different therapeutic approaches, constituting an example of personalized medicine.