child's psychological and physical development debated. The MD teams' spectrum was discussed.'

4 OBESITY COMORBIDITIES AND TYPE 2 DIABETES IN CHILDREN AND ADOLESCENTS

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Pediatric obesity is a growing global health problem. Arab children are among the world`s ten heaviest children. The causes of childhood obesity are complex and multifactorial. Assessment of an obese child includes history, thorough examination and investigations for the cause and comorbidities. Abdominal obesity is the predictor of other components of metabolic syndrome regardless the body mass index (BMI). Components of metabolic syndrome run in vicious circles. Obesity- induced inflammation and insulin resistance press the button of other components of metabolic syndrome. Beta cell dysfunction passes through phases of stressed beta cells with insulin resistance and prediabetes followed by failing beta cells and type 2 diabetes. Screening for type 2 diabetes is indicated in children aged 10 years and more with BMI above 85th percentile for age with risk factors. Glucolipotoxicity exacerbates beta cell loss and dysfunction causing type 2 diabetes. Non alcoholic fatty liver disease (NAFLD) is a common comorbidity associating obesity initiated by oxidative stress and inflammatory cytokine release that could end by liver cirrhosis. Polycystic ovary syndrome (PCOS) is a complex interaction between genes and environment leading to excess hepato-visceral fat causing hyperandrogenism and insulin resistance. Healthy life style is the cornerstone of treatment of PCOS. Obesity is only the tip of the iceberg. Therefore, screening for obesity comorbidities is important.

5 AN UPDATE ON OBESITY AND TYPE 2 DIABETES TREATMENT

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Early management of childhood obesity is key to prevent complications such as cardiovascular disease, type 2 diabetes, steatohepatitis and sleep apneoa. Strategies range from environmental changes to lifestyle modification to pharmacotherapy to bariatric surgery.

Environmental strategies include changes to food marketing and labelling, improved education, accessible leisure facilities and the increasing use of fitness wearables and applications. Campaigns such as '5-a-day' for fruit and vegetable intake have done a lot with simple memorable messages to improve awareness.

Lifestyle interventions are the mainstay of paediatric obesity management with an emphasis on simple messages, avoiding added sugars, daily exercise goals, limiting screen time and promoting good sleep hygiene. A whole-family approach is preferred with positive messages about promoting good health and fitness.

Pharmacotherapy of childhood obesity is limited by the lack of medications licensed for use in children, but can be considered for those who are gaining weight despite lifestyle intervention. Licensed medications include Orlistat and GLP-1 analogues for paediatric obesity, Setmelanotide for POMC, proprotein convertase subtilisin/kexin type 1 and LEPR deficiency, and Metreleptin for congenital Leptin deficiency. Other agents are under review but lack sufficient data for paediatric licensing.

Bariatric surgery should be considered in post pubertal children who have obesity with comorbidities, or those with obesity despite lifestyle modifications, but requires an experienced bariatric multi-disciplinary team approach. Ongoing studies have shown that weight loss post bariatric surgery is maintained at 5 year follow up.

6 IMPLEMENTING TAILORED RESOURCES FOR CARBOHYDRATE COUNTING IN CLINICAL SETTINGS

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It is recommended that children and young people (CYP) with type 1 diabetes (T1DM) should access ongoing education for self-management of their diabetes, including carbohydrate (CHO) counting.[1] Despite all the technology, there is a need to understand the basics of how the various food groups interact with the body and the ways of CHO counting, protein and fat, to match the amount of insulin required.[2]

Families must be supported to implement CHO counting advice tailored and specific to cultural needs.[3] Diabetes self-care requires knowledge of CHO counting of cultural foods including carbohydrates, protein and fat in commonly eaten cultural foods is limited and the effects that diet, insulin and exercise. Evidence suggests that CHO counting may have positive effects on metabolic control and on reducing glycosylated haemoglobin concentration (HbA_{1c}).[4] Moreover, CHO counting might reduce the frequency of hypoglycaemia.[4] In addition, with CHO counting the flexibility of meals and snacks allows children and teenagers to manage their T1D more effectively within their own cultural lifestyles.[4]

Despite several methods and reference booklets that have been developed by diabetes care teams, CHO counting is often inaccurate, and can even be skipped by patients.[2] Several medical applications in diabetes care to help patients with T1DM have been developed over the last decade.[2] Studies suggest that CHO counting is difficult for both health professionals and children and adolescents with diabetes.[4]

There are a number of culturally specific resources such as CHO counting books, apps and websites to support CHO counting in clinical settings. However further studies will be needed to determine whether these culturally specific resources could be used in the long term to improve metabolic control in targeted populations. Provision of culturally appropriate education material and resources should be locally implement to educate CYP with T1DM and their families.[3]

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7 UPDATE ON THE ARTIFICIAL PANCREAS HYBRID CLOSED LOOP: A 10-DAY INITIATION PROTOCOL OF ADVANCED HYBRID CLOSED LOOP SYSTEM IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES, PREVIOUSLY TREATED WITH MULTIPLE DAILY INJECTIONS

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Introduction Advanced Hybrid Closed Loop (AHCL) systems provide superior glycemic control in children and adolescents with Type 1 Diabetes (T1D). Current studies included participants with previous pump and Continuous Glucose Monitoring (CGM) experience.

Objectives We aimed to study transitioning these patients on Multiple Daily Injections (MDI) without prior pump experience to AHCL systems within a short period, utilizing a structured initiation protocol and the glycemic control they achieved with the MiniMed 780G system.

Methods Children and adolescents (aged 7–17 years) with T1D on MDI therapy and HbA1c below 12.5% were recruited in this prospective open label single-arm, single-center study. All participants followed a structured initiation protocol including 4 steps: step 1: AHCL system assessment (1 hour discussion with educator); step 2: AHCL system training (2-hours sessions in 4 consecutive days with groups of 2 to 3 participants and caregivers); step 3: SAP use for 3 days; step 4: AHCL system use for 12 weeks, cumulating in 10 days from MDI to AHCL initiation. The primary outcome of the study was the change in the time spent in the target in range (TIR) of 70–180 mg/dl and HbA1c from baseline (MDI + CGM, 1 week) to study phase (AHCL, 12 weeks).

Results 34 participants were recruited and all of them completed the 12 weeks study. TIR increased from 42.1±18.7% at baseline to 78.8 ±6.1% in the study phase ($p<0.001$). HbA1c decreased from 8.6±1.7% (70±18.6 mmol/mol) at baseline, to 6.5±0.7% (48±7.7 mmol/mol) at the end of the study ($p=0.001$). The participants used the sensor for a median of 96% of the time and spent a median of 90% in AHCL during the 12 weeks. No episodes of severe hypoglycemia or DKA were reported.

Conclusions Children and adolescents with T1D on MDI therapy who initiated the AHCL system following a 10-days structured protocol achieved the internationally recommended goals of glycemic control with TIR >70% and a HbA1c of <7%.

8 MONOGENIC DIABETES; AN UPDATE ON DIAGNOSIS AND MANAGEMENT

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Although the majority of children with diabetes have type 1 other forms of childhood diabetes do exist. Following the rising epidemic of childhood obesity pediatricians started to see more cases of type 2 diabetes and advances in molecular genetics led to identifying some children with diabetes due to single gene defects, the so called monogenic diabetes. In addition, with the increase in the survival rate of children with cancer and other chronic illnesses cases of secondary diabetes became more prevalent.

The importance of making the correct classification of childhood diabetes are numerous: It could guide the best treatment for diabetes, define the diagnosis in other family members and explain other associated feature. However, if not sure it is safer to treat any child with diabetes as type 1.

The presentation will discuss when type 1 diabetes is unlikely and provide clinical examples of different forms of non-type 1 diabetes with more focus on monogenic diabetes.

9 MONOGENIC DIABETES: THE PALESTINIAN EXPERIENCE

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Introduction Monogenic diabetes is a type of diabetes resulting from mutations of a single gene that may be spontaneous de novo or autosomal dominant or recessive. Reported incidence is 1–4% and confirmed by molecular genetic testing. Transient neonatal diabetes is usually diagnosed within the first week of life and resolves around 12 weeks. Permanent neonatal diabetes should be considered in all children presenting with diabetes in first month of age, and do not resolve. Genetic diagnosis may have major effects on treatment.

Objective To determine the genetic mutation pattern of suspected cases of monogenic diabetes in patients referred to Makassed Hospital in Jerusalem.

Methods Molecular detection has been done for those infants who were fulfilling the following criterion:

Infants with diabetes both transient (**TNDM**) and permanent neonatal diabetes (**PNDM**), Infants with diabetes diagnosed between 6 and 12 months of age and negative antibodies, Infants with diabetes associated with extra pancreatic features, Infants with diabetes presenting before 6 months of age as type 1 diabetes.

Results Patients were evaluated at Makassed Hospital, underwent genetic testing and revealed 10 novel mutations, 3 with previously described mutations and another 2patients without final genetic diagnosis.

Conclusion Monogenic diabetes is not very uncommon, higher rate of consanguinity predicts higher risk and is often misdiagnosed as type 1 or type 2 diabetes.

Diabetes diagnosed before 6 months of age will be monogenic diabetes and the underlying gene mutations can be identified in most of the cases, guiding the most appropriate management for patients.

This will enable genetic counselling, correcting the diagnosis of other family member & explain other associated features; predict the clinical course of the disease.