

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 apnoea. 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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