Speakers' abstracts

1 PITFALLS IN MANAGEMENT OF DIABETIC KETOACIDOSIS (DKA)

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Diabetic Ketoacidosis is known as acute complication of diabetes occurring in a high percentage of patients at disease onset-frequency varies worldwide from 15% to 70% – with higher risk in very young children and in children of ethnic minority groups as well as families with reduced access to medical care. Furthermore, this acute diabetes complication can also occur at any time during disease based on insulin deficiency. In children with established diabetes risk factors for DKA are poor metabolic control, omission of insulin, gastroenteritis and vomiting, psychiatric disorders and eating disorders, unstable family circumstances and risk behaviour during puberty. Additionally, during Covid-Pandemic a worldwide increase of DKA has been reported.

Clinical signs of diabetic ketoacidosis include dehydration, nausea, vomiting, abdominal pain, tachycardia and tachypnoe, deep respiration, drowsiness, confusion and progressive decrease in level of consciousness.

The management of DKA and/or the hyperglycemic hyperosmolar state (HHS) includes intravenous rehydration and correction of electrolyte disturbances, insulin replacement and clinical and biochemical monitoring throughout the DKA episode. Simple, clear and effective algorithms for the management of DKA need to be established at every department of paediatrics.

During treatment of DKA several complications can occur. Watch out for neurological deteriorations as a sign of severe complications during DKA. Cerebral injury (CI) – formerly cerebral edema – may occur at any stage of DKA. Symptoms of CI include headache, change in neurological status followed by high blood pressure, bradycardia, respiratory suppression. Be aware of other complications of DKA during treatment like hypopotassiaemia, hyperchloremic acidosis, hyperglycemic hyperosmolar state and inadequate rehydration but also hypoglycaemia during insulin infusion.

2 INCIDENCE AND RISK FACTORS FOR PAEDIATRIC DIABETIC RETINOPATHY: CASE CONTROL FOR A TERTIARY HOSPITAL IN LEEDS, UNITED KINGDOM

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Background Diabetic retinopathy is a leading microvascular complication and preventable cause of vision loss. NHS diabetes eye screening program (DESP) assesses for early signs, enabling review of modifiable risk factors.

Aims and Objectives Establish clinical characteristics and modifiable risk factors for patients with retinopathy identified by DESP under Leeds Children's Hospital.

Material and Methods Retrospective case control, comparing patients with evidence of diabetic retinopathy versus age-matched control. Patients identified by DESP, mild non-proliferative diabetic retinopathy (NPDR) (R1/M1) or more severe.

Results Retinopathy identified in 9.7% of those eligible for eye screening (n=37/380). There was a female predominance 59.4% (n=22/37) compared to the control group 47.2% (n=27/36). On average, the retinopathy group had 2.6 years longer duration of diabetes and lower clinic attendance.

The mean last two HbA1C measurements were higher in the retinopathy group (n=69.9mmol/mol and 71.4mmol/mol) compared to control (n=60.6mmol/l and 58.7mmol/mol). Similarly time in range (TIR) was lower (n=43% versus n=52%). More of those in the retinopathy group had an HbA1C >80mmol/l 29.7% (n=11/37) versus 13.8% n=5/36).

There was more technology uptake in the control group; pump use 63.8% (n=23/36) versus 54.0% (n=20/37), hybrid closed-loop (HCL) (n=5 versus n=1) and 86.1% (n=31/36) using sensors versus 75.6% (n=28/37).

The retinopathy group had more evidence of other microvascular disease, urine albumin-creatinine ratio (uACR) 1.35mg/mmol versus 0.7mg/mmol, with 5 patients in retinopathy group having uACR >2.5mg/mmol compared to 0.0mg/mmol.

Importantly both groups mean body mass index (BMI) standard deviation score (SDS) were in the overweight category (SDS>+1) and mean total lipids and triglycerides exceeded recommended cut offs of >4mmol/l and >1mmol/l respectively. More patients had high triglycerides (>1.5mmol/l) in the retinopathy group 27.0% (n=10/37) versus 8.3% (n=3/36). Systolic blood pressure (SBP) was comparable.

Conclusion Rates of retinopathy are comparable to previous studies. Those with retinopathy were mostly female, had higher mean HbA1C, lower mean TIR and longer mean duration of diabetes. Those with retinopathy were twice as likely to have a meanHbA1C >80mmol/l. Technology uptake was 10% greater in those without retinopathy, with five times greater HCL use.

Engaging the teenagers with poor control remains a key challenge; those with retinopathy had poorer clinic attendance. The importance of lifestyle intervention has been highlighted.

3 EMOTIONAL AND PSYCHOLOGICAL NEEDS OF PEOPLE WITH DIABETES (INTERACTIVE SESSION)

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The case presentation is about a diabetic child presenting to the paediatric endocrinology clinic with a history of multiple admissions and DKAs, and an uncontrolled BG profile. The usual MD care takes place and during one of the admissions, the child confides in the psychologist about a history of physical and verbal abuse by the mother happening since many years. Wishes of confidentiality expressed by the child and the ethical concerns come forward to the clinical scene and require MD meetings with social work and legal teams. A decision to report the concern of physical and verbal abuse to the Child Protection Services is taken. The stakes of reporting were discussed, along with the medical, psychological, social, legal and ethical aspects of this clinical presentation. Also the effects of reporting on the care relationship were discussed as well as the effects of physical abuse on diabetes care and the

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]

REFERENCES

1. Phelan H, Lange K, Cengiz E, *et al*. ISPAD clinical practice consensus guidelines 2018: diabetes education in children and adolescents. *Pediatr Diabetes* 2018;**19** (Suppl 27):75–83.
2. Deeb A, Al H ajeri A, Alhmoudi I, Nagelkerke N. Accurate carbohydrate counting is an important determinant of postprandial glycemia in children and adolescents