post treatment withdrawal. Molecular analysis was carried out with help of a custom NGS panel (MonDIAB.V3; 385 genes) in 80% of the patients. No mutations were identified in known genes implicated in the etiology of congenital hyperinsulinism (*ABCC8, KCNJ11, HNF4A, GLUD1, HADH, SLC16A1, GCK, UCP2, HNF1A, AKT2, INSR, CACNA1D*), however, predicted deleterious variants were found in other candidate genes such as *G6PC2, TH, PMM2,* and *APPL1*, implicated in insulin secretion or glycemic homeostasis. **Conclusions:** TNH is a prevalent entity to be considered in neonates with risk factors. In our series, TNH is also present in term newborns (22% of patients) and in newborns with weight and/or height appropriate for gestational age (30%). Treatment with diazoxide at low doses is effective in the resolution of these hypoglycemias. The fasting test could be useful for a safe treatment withdrawal when resolution is suspected. No monogenic cause explaining the TNH was identified. Most of the cases molecularly examined presented with 2 or more predicted deleterious variants, suggesting a multifactorial genetic component.

Diabetes Mellitus and Glucose Metabolism

METABOLIC DISEASE IN CHILDREN

Novel Perspectives of Super-High Dose Glybenclamide in an Infant With DEND Syndrome

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Mutations in KCNJ11 gene cause a variety of persistent neonatal diabetes mellitus syndromes (PNDM), with and without developmental delay and epilepsy presentations (developmental delay, epilepsy, and neonatal diabetes - DEND Syndrome). We report a heterozygous mutation for pathogenic *KCNJ11* missense variant: c.190G>A, p. (Val64Met), reported once so far, associated with severe epilepsy and neurological deterioration phenotype, responsive to a combination of super high doses of Glibenclamide (Sulfonylurea) and oral steroids. We had the patient attached to continuous glucose monitoring, performed electroencephalogramic tracings, magnetic resonance imaging and whole exome sequencing on parents and patient DNA and Sanger sequencing (SS) on candidate gene mutations. His phenotypic description and management during 18 months, demonstrates this mutation is responsive to super-high doses of SU combined with high dose 6 weeks steroids protocol. In conclusion, we have identified a de novo heterozygous missense mutation as the etiology for severe DEND syndrome in a one day old neonate, presenting with asymptomatic hyperglycemia, responsive to a novel management combination.

Diabetes Mellitus and Glucose Metabolism

METABOLIC DISEASE IN CHILDREN

Review on the Screening of Urine Glucose in School Children and Adolescents With Obesity for Early Diagnosis of Type 2 Diabetes Mellitus in Hong Kong

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Introduction: Obesity and type 2 diabetes mellitus (T2DM) are growing health concerns. A ten-fold increase of T2DM was noted in the Hong Kong paediatric population from 1997 to 2007. T2DM is often asymptomatic at presentation, but complications can emerge rapidly, especially in youngsters. Experience in Japan, Korea and Taiwan suggests that urine glucose screening is a practical and non-invasive screening tool for identification of T2DM. The Hong Kong Student Health Service (SHS) offers yearly health checks for students and is a good platform for screening of T2DM since attendance rate is over 90% for primary school students and over 70% for secondary school students. **Method:** In 2005, SHS and the Hong Kong Paediatric Society formulated a protocol on urine glucose screening for early diagnosis of T2DM in students with obesity. Students between the ages of 10–18 years old with age- and sex- specific body mass index (BMI) >97th percentile were recruited. Those screened positive for glycosuria were referred to paediatric departments for workup under a standardized protocol, whilst those who screened positive for both glucose and ketones were referred to the emergency departments. Students enrolled from school year 2005–2006 to 2017–2018 were included. Demographic data, clinical presentation, investigatory results and co-morbidities were captured using a structured reply letter. **Results:** A total of 219,276 eligible students attended SHS in the years specified and 216,528 students (99%) completed urine glucose screening. 381 (0.18%) students were tested positive for urine glucose; 18 (4.7%) had concomitant urine ketones. In total 120 students had T2DM, 41 had pre-diabetes [impaired fasting glucose and / or impaired glucose tolerance] and 126 turned out normal. 43 students defaulted the referrals and 51 students had known diabetes. 21 students (17.5%) were started on insulin therapy upon diagnosis. A significant proportion of

students with T2DM had co-morbidities including raised alanine amino-transferase (57%), hypercholesterolaemia (59%), and hypertension (13%). Five students (4.2%) had microalbuminuria at presentation. Of those with ketonuria, two students had serum glucose of over 20mmol/L and required fluid resuscitation ± insulin infusion in high dependency unit. **Conclusion:** Our pick up rate for T2DM from students with obesity aged 10–18 years using urine glucose is 0.05% (120/216,528). According to the Hong Kong Childhood Diabetes Registry, the crude incidence of T2DM for this age group was 6.16 /100,000/year over the study period, which equates to 506 new cases of T2DM. Thus 24% of the new T2DM cases were diagnosed by this program and many had associated co-morbidities at diagnosis. Our study shows that urine glucose testing is an inexpensive and simple test that allows for early diagnosis and treatment of T2DM in the primary care setting in this at risk population.

Diabetes Mellitus and Glucose Metabolism

METABOLIC DISEASE IN CHILDREN

Safety Evaluation of the Omnipod® 5 Automated Insulin Delivery System Over Three Months of Use in Children With Type 1 Diabetes (T1D)

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Advances in diabetes technology have transformed the treatment paradigm for T1D, yet the burden of the disease remains significant. The pediatric population poses unique challenges to glucose management with unpredictable exercise and food consumption. The Omnipod 5 System is a novel hybrid closed-loop (HCL) system with fully on-body operation. A tubeless insulin pump (pod) containing a personalized Model Predictive Control algorithm communicates directly with a Dexcom G6 continuous glucose monitor (CGM, or sensor) to automate insulin delivery. Therapy customization is enabled through glucose targets from 110–150 mg/dL, adjustable by time of day, which is a critical component to individualize glucose management in children. We report on the first, pivotal outpatient safety evaluation of the Omnipod 5 System in a large cohort of children with T1D.

Participants aged 6–13.9y with T1D≥6 months and A1C<10% used the HCL system for 3 months at home after a 14-day run-in phase of their standard therapy (ST, included both pump therapy and multiple daily injections). The primary safety and effectiveness endpoints, respectively, were occurrence of severe hypoglycemia (SH) and diabetic ketoacidosis (DKA), and change in A1C and sensor glucose percent time in target range (TIR) (70–180 mg/dL) during HCL compared with ST.

Participants (N=112) were aged (mean±SD) 10.3±2.2y with T1D duration 4.7±2.6y and baseline A1C 7.7±0.9% (range 5.8–10.3%). TIR increased significantly from ST to HCL, from 52.5±15.6% to 68.0±8.1% (p<0.0001), corresponding to an additional 3.7 hours/day in target range. A1C at end of study was reduced by 0.7% to 7.0±0.6% (p<0.0001). Percentages of time in hyperglycemia were reduced: >180 mg/dL from 45.3±16.7% to 30.2±8.7% and ≥250 mg/dL from 19.1±13.1% to 9.6±5.4% (both p<0.0001). Percentages of time in hypoglycemia remained low from ST to HCL: <54 mg/dL from 0.4±0.8% to 0.3±0.3% and <70 mg/dL from 2.2±2.7% to 1.8±1.4% (both p>0.05). Mean glucose decreased from 183±32 to 160±15 mg/dL (p<0.0001). During the HCL phase there was 1 episode of SH (delayed eating after pre-meal bolus) and 1 episode of DKA (suspected infusion site failure) reported. Virtually all participants completing the pivotal study (99%) continued system use during an extension phase.

In this multi-center pivotal study in a large cohort of children with T1D, the Omnipod 5 System was safe and effective when used for 3 months at home. There were significant improvements in both TIR and A1C, while time below range (<70 mg/dL) remained low. The beneficial glycemic outcomes are critical for children, given that neurologic outcomes can be negatively impacted by hyperglycemia. The current results and commitment to the extension phase emphasize the safe and effective use of the HCL system, as well as the preference for the Omnipod 5 System over participants' previous therapy.

Diabetes Mellitus and Glucose Metabolism

METABOLIC DISEASE IN CHILDREN

The Impact of Multi-Disciplinary Input on Glycaemic Control Over Time in Children on Intensive Insulin Therapy Using Real World Prospectively Collected Data

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Aims: To investigate the factors impacting on glycaemic control over time including treatment type, educational input and patient demographics within an Irish tertiary paediatric diabetes centre. **Methods:** Using a prospectively maintained database of clinical encounters, data was analysed in age matched pairs from 2007 to 2019. Pairs were matched by insulin treatment type (pump v multiple daily injection (MDI)). Matching was performed on the basis