Sth ASPED-ISPAD Diabetes Academy Collaboration of ASPED and ISPAD

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Fifth ASPED/ISPAD Diabetes Academy Proceedings, 11th-13th April 2019, Muscat, Oman

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Abstract
The 5th ASPED-ISPAD Diabetes Academy is an initiative by the Arab Society of Pediatric Endocrinology (ASPED) in collaboration with International Society of Pediatric and Adolescence Diabetes (ISPAD) and is exclusively sponsored by Lilly, Gulf, and UAE.

The 5th ASPED/ISPAD Diabetes academy was held on 11-13 April, 2019 in Muscat, Oman. The course was accredited with 12 CME hours, by the Omani Pediatric Society. It targets young healthcare professionals in the field of pediatric endocrinology and diabetes with a primary focus on actively supporting training and education in the region. An expert faculty panel from both ISPAD and ASPED from 11 different countries selected candidates following a competitive enrollment process, announced on each organizations respective websites. This year 67 candidates were accepted (out of 117 applicants) from 15 countries (figure/photo).

The curriculum is delivered in three main formats; plenary, workshop and debate sessions. The plenary sessions covered novel therapeutic approaches, diabetes emergencies, use of technology in diabetes management, comprehensive diabetes care, dietary challenges, monogenic and rare types of diabetes, psychology and patient empowerment, obesity and type hyperlipidemia in children. In workshops, the focus was on research methodology, clinical cases, nutrition, psychology and technology within smaller groups, which provided a forum for candidates to present either a diabetes research project or unique presentation of a clinical case. Winners selected by the steering committee members presented in the final plenary session. This intensive 3 days course has consistently aimed and successfully provided a concrete educational platform for seamless exchange of clinical and scientific information. This has contributed to improvement of care and outcome for children and youth with diabetes in the ASPED region.

Faculty Abstracts
Novel Ambulatory Glucose-Sensing Technology Improves Glucose Profile, Patient Adherence and Detects Hypoglycemia Frequency and Duration in Children and Adolescents with type 1 diabetes.
Asma Deeb, Mafraq Hospital, Abu Dhabi, UAE

Background: Glucose monitoring (GM) is a mainstay of diabetes control and management. Improving glycemic control is essential to prevent microvascular complications. However, adherence to GM can be a challenge in children and adolescents. Detecting hypoglycemia is essential for its prevention and treatment. We aim to study the impact of the flash ambulatory glucose monitoring in improving diabetes control, enhancing adherence and detecting hypoglycemia in children and adolescents with type 1 diabetes.
Methods: The study is prospective involving 3 hospital visits. Children and adolescents with diabetes were enrolled in the study which involved a period on conventional glucose self-monitoring followed by a similar period of monitoring using the flash glucose monitoring device (FreeStyle Libre). Average fasting and daily glucose, frequency of GM, frequency and duration of hypoglycemia were compared on conventional and the flash monitoring.

Results: 75 subjects were studied. Mean (range) was 11.9 years (2-19). Significant difference was found between the median average of day glucose by glucometers compared with flash monitoring (P = 0.028), 68 (94%) and 65 (90%) patients had detected nocturnal and diurnal hypoglycemia respectively on Flash monitoring compared to 12 (16.6%) and 30 (41%) on glucometer testing (P< 0.00). Mean range duration of hypoglycemia was 95 minutes (15-330). Statistically-significant difference is found between the frequencies of GM on flash monitoring compared with glucometer testing (P < 0.001).

Conclusion: Flash monitoring is a useful tool to improve glycose profile, adherence to GM and detecting hypoglycemia (diurnal and nocturnal) in children and adolescents with type 1 diabetes.

Technology Work Shop
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Pediatric Endocrine Fellowship Program Director, Children’s Clinical Management Group Division of Endocrinology, Sidra Medicine, Doha, Qatar.

The DCCT trial since 1993 stated that, the better the control of diabetes the less likely the occurrence of complications. The continuous subcutaneous insulin infusion (CSII) via insulin pump is considered a great achievement in the insulin delivery that proved its superiority in controlling diabetes over other regimens. The insulin pump is indicated in cases with poor control, needs accurate frequent doses, young age, lifestyle flexibility, and many other indications make it appropriate for most of cases. It has advanced features in the basal and bolus insulin delivery, small doses as low as 0.025 IU and needless frequent doses. For the best achievement with pump, patient should be familiar with technology use, counts carbohydrates, and have realistic expectations from the pump therapy as an insulin delivery modality rather than a diabetes cure. The great progress in the accuracy of the continuous glucose monitoring system (CGMS) made the control of diabetes with or even without pump much convenient, achievable and can prevent glycemic excursions which is proved to be more correlated with complications. Integration between the pump and the CGMS leads to the currently used 3/4 closed loop with the automated basal adjustment (Hybrid Insulin Pump) and the safe effective prevention of hypoglycemia. Complete closed loop between the insulin pump and the CGMS is the future of the technology and diabetes management.

Diabetes Outcomes: Sweet retry
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2. Department of Pediatrics, University Hospital VUB, Brussels, Belgium.

Diabetes mellitus is a chronic disease, requesting an intensive treatment to prevent acute complications and to delay/prevent the severe chronic complications. Comprehensive education is necessary to provide family and patients the knowledge and skills to obtain a good metabolic control. Further reduction of mortality and morbidity is still needed [1]. New drugs and new technology may help to achieve these objectives in all forms/ages of diabetes. Whether these approaches meet the objectives and have the expected added value, needs to be confirmed through long term follow up.

The importance of the quality of control has been studied in randomised controlled studies [2, 3].

Longitudinal observational studies, such as by Pirart, have in the past demonstrated the strength of this follow up [4]. Over the last 30 years different registries either almost nationwide, regional or hospital based have started to contribute to the evaluation of quality of care and benchmarking of outcome between centers and countries [1, 5].

To compare and improve the quality of care in pediatric diabetes at a global level, by sharing data and learning from best practice, the SWEET registry has been created [6]. Currently data of more than 76 centers from all continents , including over 45,000 patients (aged below 25 years) are included.

To participate a center needs to submit biannually data on all patients. Based on these data, all participants receive biannual reports with process and outcome data. During the annual meetings, these data are discussed and best practice options analysed. Different challenges on different continents are identified and need to be taken into account when evaluating best practice.

Through a common data set, sharing of these data, experience and outcome, harmonization of cross border health care and improved short and long term outcome in all youth with diabetes should be achievable.

1) Rawshani et al, NEJM 2017
2) Nathan DM et al, Diabetes Care 2014
3) Today Study Group, NEJM 2012
4) Pirart et al, NEJM 1978
5) Warncke et al, Pediatric Diabetes 2016
6) Danne et al, Pediatric Diabetes 2012

CSII versus CGM: which one would you choose?
Carine de Beaufort, MD, PhD,
1 DECCP Pediatric Clinic/Centre Hospitalier de Luxembourg, Luxembourg, Luxembourg
2 Department of Pediatrics, University hospital, Free University of Brussels (VUB), Brussels, Belgium.

Type 1 diabetes mellitus in childhood is a chronic disease, necessitating a lifelong insulin administration. Although the discovery of insulin last century offered survival for the persons with diabetes, long term registries still report an increased mortality [1]. This suggests that treatment requests further improvement.

Current diabetes treatment includes insulin administration, with syringes, pens or pumps, comprehensive education and either home blood glucose measurements or continuous glucose monitoring (CGM).

To meet treatment objectives in youth, insulin administration needs to be flexible and adjusted to age specific challenges.

Use of continuous subcutaneous insulin infusion (CSII) - when available - is in the younger children the current golden standard, whereas in other age groups it may be a helpful tool to render the 24/7 treatment of diabetes a little bit easier [2]. Although in the nearby future, the hybrid artificial pancreas (which integrates with an algorithm the CGM data in the CSII) should become available, a good metabolic control should be achieved today. It will be the role of the treatment teams to identify the best tools for each patient, as diabetes treatment should be made to measure.

1) Rashwani et al, NEJM 2017
2) Sundberg et al, Pediatric Diabetes 2017

Role of technology in prevention of hypoglycemia
Goran Petrovski,
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One potential solution in improving Type 1 Diabetes T1D management is the use of technology, providing additional opportunities to support management, maintain and improve communication and engagement with healthcare services. Continuous glucose monitoring (CGM) provides information unattainable by intermittent capillary blood glucose, including instantaneous real-time display of glucose level and rate of change of glucose, alerts and alarms for actual or impending hypo- and hyperglycemia, “24/7” coverage, and the ability to characterize glycemic variability. CGM can inform, educate, motivate, and alert people with diabetes.
CGM is medically indicated for patients with frequent, severe, or nocturnal hypoglycemia, especially in the presence of hypoglycemia unawareness. CGM can be used as personal or professional use. Patients should receive structured education on personal CGM device, how to use and how to respond to alerts and alarms. CGM in combination with insulin pump is changing the diabetes treatment and diabetes life. The algorithms can suspend the insulin delivery on low glucose level or before going low to prevent low glucose levels. Another advantage of combined CGM and insulin pump is a hybrid closed loop, which delivers small amount of insulin every 5 minutes based on glucose levels.

Bariatric surgery in older children and adolescents

Guido Mannaerts, MD, PhD,
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Obesity and its related diseases has become the number one health problem, especially so in the Gulf region where a quarter of the population has diabetes. Obese children and adolescents are more prone to these future health issues. Besides that they frequently experience social isolation, bullying resulting in a lower self-esteem, depression, and as a result shying away from activities, which makes them even more likely to find comfort in eating.

Bariatric surgery is the only therapy that results in substantial sustainable weight loss (15-25% of total weight) in a large series of morbid obese patients resulting in resolution of the obesity related comorbidities in three-quarter of morbidly obesity patients. Bariatric surgery in older children and adolescents with morbid obesity is a bit controversial evidence as, unfortunately, still many believe that conservative treatment is the way to go. Overwhelming evidence has shown that this conservative treatment even supported by medical treatment is only long-term successful in bringing and keeping the weight within the normal BMI range in less than 0.2% of morbidly obesity patients. The not by any evidence supported fear lays in the fact that we have the feeling that it is a big thing to operate a “healthy” child. Besides that many fear such operation for their possible complications. However, in skill hands the mortality of these bariatric procedures as well as their major complications reach almost 0%. Besides that this should be weighed against the future risks of morbid obesity and its related comorbidities, which risks are far greater, and the psychosocial impact of obesity in childhood. Also evidence shows that bariatric surgery has no significant influence on growth in a rich society. Though in adults the laparoscopic bypass has superior results in comparison with the sleeve gastrectomy, the sleeve gastrectomy does very well in adolescents and provides future possibilities for additional bariatric procedures if needed in the longer life span of these young patients. As the response of adolescents to bariatric surgery is comparable to those of adults the ASMS uses comparable operation criteria for these young patients in their 2018 report, being BMI 35 plus an obesity related comorbidity or a BMI > 40 kg/m2, or the 95 percentile.

Management of type 1 diabetes in children in an emergent country

Farida JENNANE.

Head of the Diabetes Unit / Pediatric Endocrinology, Children University Hospital Abderrahim Harouchi Of Casablanca.

CHU AVEROES.

Proфессor of pédiatries, Medical School. King Hassan II University.

The purpose of this presentation is to give an overview of the management of TD1M in an emerging country such as Morocco.

We underline the difficulties of managing the disease in Morocco hospital cares structures and also the individual and collective effort to improve the care of diabetic children through associative activities.

This will be illustrated by our personal experience in improving the quality of care for children with TD1 in the Greater Casablanca region by creating a reference centre for therapeutic education with the development of a structured therapeutic education program.

The epidemiology and genetic landscape of childhood diabetes in the state of Qatar.

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Diabetes mellitus (DM) is a characterized by hyperglycemia either due to insulin deficiency or resistance. It is a major health burden across the world, especially in the Middle East. The National Diabetes strategy 2016-2022 held in Qatar stated that diabetes is a major health challenge faced by Qatar and the prevalence of diabetes (adults) in Qatar is over double that of the world population, at 17%. There are no figures on the prevalence and epidemiology of the different types of diabetes in children in Qatar. No previous studies have focused on understanding why diabetes is so common in children in the state of Qatar. Compared to adults, children can have many different types of diabetes. Children can have neonatal diabetes (starting from birth to 6 months of age), type 1, type 2, Maturity Onset Diabetes of the Young (MODY), autoimmune monogenic, mitochondrial, syndromic and yet unclassified forms of DM. Currently there is no knowledge on the epidemiology or the prevalence of the different types of DM in children or on underlying genetic/molecular basis of DM in these children in Qatar. Therefore, we have embarked on a comprehensive study to understand the epidemiology and biochemical mechanisms of DM of every child in the state of Qatar. During the talk I will give an overview of the study, discuss the preliminary results and show how in some cases understanding the underlying mechanisms of the DM has transformed the lives of some of the children and their families.

Familial Hypercholesterolemia: an overview

Manal Al Kindi,

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Familial hypercholesterolemia (FH) is autosomal dominant, characterized by elevated LDL-C level, cutaneous manifestations (tendinous xanthomas), and a 20 fold increase in risk of atherosclerotic cardiovascular disease (ASCVD).

The prevalence of Heterozygote FH estimated to be 1 (250-500) depends on the country.

There are at least three major genes are known to cause FH: the LDLR, APOB, rarely, PCSK9 (gain of function). Secondary causes of hypercholesterolemia such as DM, hypothyroidism, hepatic disease, renal disease, and drug should be excluded first before making the diagnosis.

There is no single internationally accepted set of criteria for the clinical diagnosis of FH. Commonly used are the US, UK (Simon Broome) and DLCN. Genetic testing may give a definite diagnosis of FH by detection of a pathological mutation.

Early diagnosis of FH enables prompt treatment and prevention of consequent morbidity and mortality from premature CHD. Statins are the current standard treatment for the majority of HeFH patients, and have shown to be effective in reducing the incidence of cardiovascular heart disease in patients with FH. There other non-statins therapy can be used. The new pharmacotherapy such as inhibition PCSK9 help in control LDL. The clinical validity and utility of cascade screening for FH is effective way to identify persons who have FH. However, the Screening Varies from Country to Country.

SWEET Registry: ASPED Center experience

Nancy Samir Elbarbary,
Professor of Pediatrics, Pediatric Diabetes Unit, Consultant of Pediatric Diabetes, Ain Shams University, Cairo, Egypt.
**Background:** Diabetes affects many children living in developing countries. The largest contribution to the total number of estimated childhood type 1 diabetes mellitus (T1DM) cases comes from Egypt which accounts for about a quarter of the middle east region’s total. Despite the existence of evidence-based guidelines for the care of children with diabetes, widespread gaps in knowledge, attitude, and practice remain.

SWEET (Better control in Pediatric and Adolescent diabetesS: Working to crEate CEntErS of Reference) provides reviews of benchmarking practices among different contributing centers.

**Methods:** From a developing country like Egypt, we will share our perspectives on caring for children with diabetes. In this presentation, our center will provide a description of the population of children with diabetes we serve, the organization of care, and our future direction. The anticipated benefits and challenges encountered with participation in SWEET will also be discussed.

**Results:** According to benchmarking and data validation report that has been received from SWEET, our center had contributed data for 239 patients (58.6% female). The mean age is 11.5 ± 3.48 years, with a median diabetes duration of 4.3 years. Median HbA1c of all patients’ (T1DM) was 8.3% (67 mmol/mol), with 18.9%, 50.5%, and 30.4% of patients having HbA1c < 7.5% (58 mmol/mol), 7.5%–9% (58–75 mmol/mol) and >9% (75 mmol/mol), respectively. In our population 55.3% of patients presented with DKA at time of diagnosis and 10.8% had hyperlipidemia.

**Conclusion:** The results of our center are a testimony of the reality of managing diabetes by dynamic teams striving to achieve recommended standards of care for pediatric diabetes in an environment with limited resources. Dissemination of results and prospective projects serve as further motivation to improve outcome. Our vision is that the participation of our center in SWEET is encouraging to deliver increasingly accurate and complete data and is inspiring to other centers in the ASPED region to participate in SWEET registry. Comparing processes and outcomes will help members identify weaknesses and introduce innovative solutions, resulting in improved and more uniform care for patients with diabetes.

**Interactive Psychology Session**

Oudi Abushachra,

**Acacia Medical Centre, UAE.**

Previously, almost entirely a disease of adulthood, today Type II diabetes affects many children and adolescents. Obesity is the single most important contributor to its development and weight loss is its best cure. However, achieving and maintaining weight loss is extremely challenging especially in children. Diets, because of their restrictive nature, are notorious for limited short term benefits and lack of sustainability. This lecture will explore dietary patterns in the overweight and obese, which promote weight gain and may be key in sabotaging weight loss efforts. We will then uncover how these eating habits may present potential areas for intervention through “Eatology” behaviour modification.

**Obesity Co-morbidities; Experience from Egypt.**

Rasha T. Hamza.

**Professor of Pediatrics, Consultant Pediatric Endocrinologist, Ain Shams University, Cairo, Egypt.**

**Abstract:** Obesity epidemic is becoming a global health problem due to the alarming rise in its rate. Abdominal obesity predisposes to metabolic syndrome (MS) in the form of hypertension, dyslipidemia, impaired fasting blood sugar ending up by type 2 diabetes, cardiovascular disease and stroke. For this reason, the International Diabetes Federation Task Force chose the waist circumference as the best anthropometric correlate of intra-abdominal fat as the “obesity factor” of pediatric MS definition. Peripheral insulin resistance and subclinical obesity-related inflammation are the primary driving factors for MS. Other associations include non-alcoholic fatty liver disease (NAFLD) and polycystic ovary syndrome (PCOS) in adolescent girls, anemia, obstructive sleep apnea syndrome and psychological problems like depression and anxiety. The work up includes proper anthropometric assessment and hormonal profile to exclude endocrinial problems. In addition, laboratory tests should be requested to exclude complications like lipid profile, fasting glucose, fasting insulin, liver function tests, follicle stimulating hormone (FSH), luteinizing hormone (LH), testosterone, 17-hydroxyprogesterone. Pelviabdominal ultrasound is important to exclude NAFLD and PCOS. Weight loss and regular exercise are of great importance. Medical treatment varies according to the cause and co-existing complications. The choice of bariatric surgery depends upon body mass index (BMI), associated co-morbidities and age.

**FITTER recommendation**

Rasha Odeh,

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Diabetes is currently one of the most common prevalent non-communicable diseases worldwide. Insulin therapy is one of the options for treatment of type 2 diabetes and the only therapy for type 1 diabetes. Few guidelines or clinical recommendations have been made available to help clinicians manage insulin injection and infusion therapies. This is a particular challenge for children and young adults. The Forum for Injection Technique and Therapy: Expert Recommendations (FITTER) was the fourth in a series of expert workshops that have issued recommendations on insulin delivery. After which the first Middle East and North Africa ASPED FITTER Insulin Delivery Recommendations for Children and Young Adults were created.

**Key recommendations:**

1. The shortest needles (currently the 4-mm pen and 6-mm syringe needles) are safe, effective, and less painful and should be the first-line choice in all patient categories.
2. Intramuscular injections should be avoided, especially with long-acting insulins, because severe hypoglycemia may result.
3. Lipodystrophy is a frequent complication of therapy that delays insulin absorption, and, therefore, injections and infusions should not be given into these lesions.
4. Correct site rotation will help prevent lipodystrophy.
5. Effective long-term therapy with insulin is critically dependent on addressing psychological hurdles upstream, even before insulin has been started.
6. Inappropriate disposal of used sharps poses a risk of infection with blood-borne pathogens; and mitigation is possible with proper training, effective disposal strategies, and the use of safety devices.
7. Adherence to these new recommendations should lead to more effective therapies, improved outcomes, and lower costs for patients with diabetes.

**Updates on DKA management**

Sabine Hofer,

**Department für Pädiatrie 1, Medizinische Universität Innsbruck, Austria.**

Diabetic ketoacidosis is known as acute complication of Type 1 diabetes occurring in a high percentage of patients at disease onset. Furthermore, this acute diabetes complication can occur at any time based on insulin deficiency. Clinical signs of diabetic ketoacidosis (ranged from mild to severe ketoacidosis) are signs of dehydration, nausea, vomiting, abdominal pain, tachycardia and tachypnoe, deep respiration, drowsiness, confusion and progressive decrease in level of consciousness. Diabetic ketoacidosis is defined as hyperglycemia (>11 mmol/L, >200 mg/dl), venous pH <7.30 or serum bicarbonate <15 mmol/L and ketonemia/ketonuria. The hyperglycemic hyperosmolar state (HHS) may overlap with DKA, characterized with very high plasma glucose concentrations and effective serum osmolality >320 mossm/kg.

DKA may be developed 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.
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. The management of DKA is based on treatment of insulin deficiency and fluid rehydration. Simple, clear and effective algorithms for the management of DKA must be established at every department of paediatrics. Ideally a child with DKA should be managed by an experienced staff trained in management and monitoring of DKA in children and adolescents. Laboratory access to frequent and timely biochemical measurements is also needed in treatment and monitoring of DKA.

Treatment of DKA includes intravenous rehydration and correction of electrolyte disturbances, insulin replacement and clinical and biochemical monitoring throughout the DKA episode. Fluid and salt rehydration should improve circulation volume, replace sodium and the intra- and extracellular water deficits and improve glomerular filtration rate to improve clearance of glucose and ketones from the blood. Insulin infusion is needed to solve the cause of DKA. A dose of 0.05 to 0.1 Unit/kg/h is suggested as initial dose to start with. Timely and regular monitoring of blood glucose levels are needed to titrate insulin dose. Be aware that insulin deficiency is the main cause of ketoacidosis and therefore insulin replacement needs to be continued and is not allowed to be stopped. Watch out for neurological deteriorations as sign of severe complication during DKA. Cerebral injury (CI) may occur at any stage of DKA. The incidence of CI (formerly cerebral edema) varies from 0.5 – 0.9% associated with a mortality rate of up to 24%. Symptoms of CI are headache, change in neurological status followed by high blood pressure, bradycardia, respiratory suppression. Other complications of DKA are hypokalaemia, hyperchloremic acidosis, hypoglycaemia and inadequate rehydration.

On these grounds prevention of DKA is most important. Information campaigns might be useful to prevent DKA at disease onset. Identifying risk factors for DKA in children with established diabetes might be helpful to allow better identification and better education of persons at risk for DKA.

**Stem cell therapeutic potential**

**Sarah Al Khawaja,**

**College of health and life sciences, Hamad Bin Khalifa University, Doha-Qatar.**

Diabetes mellitus type 1 and 2 (T1D, T2D) are characterized by loss of insulin-producing β cells either by autoimmune destruction or progressive dysfunction and loss, respectively. Stepwise differentiation of human pluripotent stem cells (hPSCs) into functional β cells provides an opportunity to study otherwise inaccessible phases of human β cell development and function in vitro. Studies have shown that β cells are specified through several stages of progenitors during pancreas development, each stage defined by the expression of specific transcription factors (TFs). Understanding the different signaling pathways that control the differentiation and specification process will enable a more efficient generation of functional β cells in vitro. Herein, we discuss the most recent advancements in the field of stem cells and cellular therapy for T1DM that have received approval from the U.S Food and Drug Administration (FDA) in August 2014. Recent encapsulation devices products are based on the differentiation of pluripotent stem cells into pancreatic beta cell precursors (PEC-01™), with subcutaneous implantation in a retrievable medical device (Encaptra® cell delivery system). Once implanted, the precursor cells mature into endocrine cells that secrete insulin and other hormones in a regulated manner to control blood glucose levels. The device is usually implanted under the skin of the patient through a straightforward outpatient surgical procedure. Effectiveness in Preclinical Disease Models have proven efficacy in mouse models. Finally, the following therapy outlook are expected; long-term control of blood glucose levels with a single minimally invasive outpatient implant, targeted Insulin independence, reduction in the long term chronic complications, significantly reduced risk of hypoglycemia. Physiologic production of other pancreas-derived regulatory hormones and co-factors, and ability to terminate treatment by minimally invasive, outpatient removal of the encapsulated product, if needed.

**Medical Nutrition Therapy in Type 1 Diabetes Work Shop**

**Sheryl Salis,**

**Registered Dietician and Certified Diabetes Educator, Consultant- Juvenile Diabetes Association and Director- Nurture Health Solutions, Mumbai, India.**

There is a steady rise in the number of individuals with type 1 diabetes now, previously known as Juvenile diabetes or Insulin Dependent Diabetes Mellitus (IDDM).

Nutritional management is one of the cornerstones of diabetes care and education. Dietary recommendations for children with diabetes are based on healthy eating recommendations suitable for all children and adults and therefore, the whole family.

A guide to the distribution of macronutrients

- Carbohydrate 45% to 55% energy
- Moderate sucrose intake (up to 10% total energy)
- Fat 30% to 35% energy, <10% saturated fat + Trans fatty acids
- Protein 15% to 20% energy

**Carbohydrate:**

Carbohydrate requirements in children and adolescents are individually determined based on age, gender, activity and previous intake. Clinical evidence suggests that individuals typically consume 45% to 50% energy from carbohydrate and can achieve optimal postprandial glycemnic control with appropriately matched insulin to carbohydrate ratios and insulin delivery.

Healthy sources of carbohydrate foods should be encouraged to minimize glycemic excursions and improve dietary quality. Addition of a moderate amount of protein to a meal containing predominantly carbohydrate can assist in reducing postprandial excursions. Substituting low-Glycemic Index (GI) for High-GI carbohydrate and increasing dietary fiber intake are other useful dietary options. A meal-time routine with limits on snacking episodes can assist in preventing prolonged periods of postprandial hyperglycemia. Sucrose can provide up to 10% of total daily energy intake.

A more flexible approach using individualized insulin to carbohydrate ratios (ICR), which enables the preprandial insulin dose to be matched to carbohydrate intake, should be used for children and adolescents on intensive insulin therapy. The ICR is individualized for each child according to age, sex, pubertal status, duration of diagnosis and activity.

In order to assess the accuracy of the insulin to carbohydrate ratio pre- and post 2 to 3 hours post-prandial BGL testing is required. Although this method increases flexibility of the meal timing and the carbohydrate amount, meal-time routines and dietary quality remain important.

For high fat and high-protein meals, combination bolus with sufficient insulin upfront to control the initial postprandial rise is needed. Pre- and post-prandial blood glucose testing at 3, 5 and 7 hours or continuous glucose monitoring systems can be useful in guiding insulin adjustments and evaluating the outcomes of changes to the insulin dose or timing.

**References:** Ispad Clinical Practice Consensus Guidelines 2018: Nutritional Management In Children And Adolescents With Diabetes Carmel E. Smart,1,2 Francesca Annan3 | Laurie A. Higgins4 | Elisabeth Jelleryd5 | Mercedes Lopez6 | Carlo L. Acerini7
Delegates’ Presentations Abstracts

GROUP 1

Metabolic improvement offered by Medtronic Minimed 640 G associated to transient insulin perfusion suspension before hypoglycemia in young patients with type 1 diabetes.

Yasmine Ibrahim Elhenawy ¹, Mona Hussein El, Isabelle JOURDON², Nadine LEPAGE¹, Marie-Eve SCHMIDT², Michel POLAK³, and Jacques BELTRAN⁴ ²

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Objective: Fear of hypoglycemia interferes frequently with metabolic control of type 1 diabetes especially in patients under 5 years of age who are at high risk of hypoglycemia and low metabolic control. Medtronic Minimed 640 G Insulin pump with Smart Guard technology (suspension of insulin perfusion in predictive hypoglycemia situations) appears to be an adequate system for these patients by reducing the risk of hypoglycemia.

Research design and methods: Retrospective study, patients with type 1 diabetes using Medtronic Minimed 640G with Smart Guard technology. Carelink-Pro software used to follow continuous glucose monitoring (CGM) as well as HbA1c.

Results: 11 patients with type 1 diabetes, median age 4.5 years old (22 months - 8 years old): 27 % girls, 73 % boys. Median age at diagnosis 22 months old (11 - 40 months old). Insulin pump used on average 12.5 months after diagnosis. CGM + Smart Guard technology added on average 7.1 months after starting insulin pump. Study duration: 6 – 24 months.

Significant reduction of time spent in hypoglycemia: 6 - 90 episodes of hypoglycemia per month before intervention, 0 - 10 minutes of hypoglycemia during the last month of the study and an average duration of 145 minutes of stopped insulin administration (113 - 204 minutes). No major hypoglycemia noted either hyperglycemia or Ketonis secondary to transient treatment suspension.

Significant improvement of metabolic control, average HbA1c 8.26% before intervention and, 7.71 % at the end of the follow-up: 0.55% of average reduction (p=0.03).

Conclusion: The Medtronic Minimed 640 G with the option of transient insulin suspension before hypoglycemia shows a positive impact in the treatment of type 1 diabetes allowing physicians to attempt metabolic control, with limited episodes of hypoglycemia and better quality of life of patients and their families. Age who are at high risk of hypoglycemia and low metabolic control. Medtronic Minimed 640 G Insulin pump with Smart Guard technology (suspension of insulin perfusion in predictive hypoglycemia situations) appears to be an adequate system for these patients by reducing the risk of hypoglycemia.

Urinary miRNA-377 and miRNA-216a as biomarkers of nephropathy and subclinical atherosclerotic risk in pediatric patients with type 1 diabetes

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Background: Urinary microRNAs (miRNAs) play a role in the pathogenesis of chronic kidney disease (CKD).

Objectives: To identify the expression of urinary miR-377 and miR-216a in 50 children and adolescents with type 1 diabetes (T1DM) compared with 50 healthy controls and assess their relation to the degree of albuminuria, glycemic control and carotid intimal thickness (CIMT) as an index of atherosclerosis.

Methods: Children and adolescents with type 1 diabetes were divided into normoalbunimic and microalbuminuric groups according to urinary albumin creatinine ratio (UACR). Urinary miRNAs were assessed using real time polymerase chain reaction. CIMT was measured using high resolution carotid ultrasound.

Results: The expression of urinary miR-377 was significantly higher in patients with microalbuminuria (median, 3.8) compared with 2.65 and 0.98 in normoalbuminmic patients and healthy controls, respectively (p < 0.05). Urinary miR-216a was significantly lower in all patients with type 1 diabetes and the lowest levels were among the microalbumuric group. Significant positive correlations were found between urinary miR-377 and HbA1C, UACR and CIMT while urinary miR-216a was negatively correlated to these variables.

Conclusions: Urinary miR-377 and miR-216a can be considered as an early biomarkers of nephropathy in pediatric type 1 diabetes. Their correlation with CIMT provides insights on the subclinical atherosclerotic process that occurs in diabetic nephropathy (DN). This may allow their use as potential therapeutic targets to avoid vascular complications in T1DM. Further studies are needed to extend and validate these observations in the setting of DN as well as cardiovascular diseases and clarify the potential utility of other types of miRNAs in early diagnosis, risk stratification for progression and treatment selection or monitoring.

Risk Factors of Diabetic Peripheral Neuropathy in Children and Adolescents with Type 1 Diabetes Mellitus

Shawq A. Jabir, Isra’a Abd Al-Hameed.

Central Child Teaching Hospital, Iraq.

Background: Type 1 diabetes mellitus is one of the most common metabolic diseases in pediatrics that can cause variety of complications including peripheral neuropathy. Although clinical peripheral neuropathy is rare in children and adolescents, subclinical peripheral neuropathy is prevalent. Some factors are assumed to increase the risk of developing neuropathy including glycemic control and duration of diabetes.

Aims of the study: The objectives of this study were to evaluate the prevalence of diabetic peripheral neuropathy among patients with type 1 diabetes mellitus and the possible risk factors associated with developing neuropathy.

Patients and methods: Cross-sectional study was conducted in the period from May 1st, 2018 till November 30th, 2018, on a group of children and adolescents with Type 1 diabetes on insulin treatment whom attended the Iraqi National Centre of Diabetes for follow up visit. Patients who included in this study were between 10-18 years old with type 1 diabetes for more than 5 years duration. Patients were evaluated through history and physical examination. Height, weight, blood pressure and pubertal stage were assessed. All patients were sent for nerve conduction study. Glycemic control was assessed by the measuring the mean glycated hemoglobin for the previous years of the disease. Also patients were sent for fasting lipid profile, 25-hydroxycholecalciferol level, spot urine albumin/ creatinine ratio, tissue transglutaminase IgA antibodies, free thyroxine and thyroid stimulating hormone as part of their annual screen. Ophthalmological examination for retinopathy was done.

Results: Fifty three patients were included in the study; 43.4% were males and 56.6 were females. Thirty three (62.3%) patients had abnormal finding in nerve conduction study. Six (11.3%) patients had symptoms related to peripheral neuropathy, while 50.9% of patients had subclinical neuropathy. Older age and longer duration of illness were associated with peripheral neuropathy. Patients with diabetic peripheral neuropathy had higher mean glycated hemoglobin, systolic and diastolic blood pressure, total cholesterol and low density lipoprotein than patients without.
No one of the pre-pubertal children had diabetic peripheral neuropathy; however, it was increasing with progression of the puberty. Low level of vitamin D, positive titre of tissue transglutaminase lGa antibodies and having microalbuminuria were associated with diabetic peripheral neuropathy.

**Conclusion:** Diabetic peripheral neuropathy is a common complication in children and adolescents with type 1 diabetes. Subclinical polyneuropathy was affecting more than 50% of patients. Longer duration of diabetes, poor glycemic control, pubertal changes are risk factors. Other factors associated with increased risk of peripheral neuropathy were dyslipidemia, hypertension, low vitamin D level and presence of celiac disease or microalbuminuria.

**Persistent hyperinsulinemia hypoglycemia of infancy: clinical, biochemical and molecular genetic characteristics of patients at King Faisal Specialist Hospital & Research Center (KFSHRC).**

Haneen Aldalaan, KFSH&RC, Pediatric department, Endocrine section, Riyadh, Saudi Arabia.

**Background:** Persistent hyperinsulinemia hypoglycemia of infancy (PHHI) is the most common cause of persistent hypoglycemia in neonates and infants in our population. The clinical manifestations range from life-threatening hypoglycemia presenting on the first day of life to only mildly symptomatic hypoglycemia in a child or adolescent that may be difficult to identify. The response to medical and surgical therapy also varies. As we have a large cohort of patients and we are a major center for referrals for these patients the aim of our study was to describe the clinical, biochemical and molecular genetic data of our patients.

**Methodology:** It is retrospective cross-sectional study by reviewing medical files. It includes all patients followed in pediatric endocrinology clinics at KFSHRC with PHHI.

**Results:** 70 patients were reviewed with a male: female 1:1. Mean age at presentation 4 12 months.

(68%) treated with subtotal pancreatectomy and 32 % responded to medical therapy, after surgery 96% of continued medications (90% octreotide and 10% diazoxide). Surgery was done at diagnoses in 60% of patients VS 40% later. 14% of those who had surgery required another surgery in1-2 year.86 % were found to have the Genetic mutation including: ABCC8 (60%), ABCC8USHR1C (12%), HNF4A (5%), KCNJ11 (6%), GLUD 3%, not done in 5% (92% were having AR disease). About 10% developed DM so far at a mean age of 10 years. 80% of patients had no neurological complications.

**Conclusion:** In our study we noticed that our patients had sever for of PHHI were majority underwent pancreatectomy but continued to require medication mainly Octreotide, there is very poor response to Diazoxide in our population, early detection and treatment improved neurological outcome of this population, Mutation in ABCC8 is the commonest genetic defect noted.

**Why is this Girl with Type 1 Diabetes Hypoglycemic?**

Haitham Alkhath, Jordan University Hospital, Amman/Jordan.

**Background:** hypoglycemia in diabetic patients is always worrisome. It has numerous causes and associated conditions such as Addison’s disease, celiac disease or overdosing of insulin.

**Case report:** Our patient is a 16-year-old female who was diagnosed with type 1 diabetes since the age of 9 years. She presented with recurrent unexplained hypoglycemia. She is on multiple daily injection method for management of her diabetes and until 2 years ago, her blood sugar readings were adequate. Her insulin ratios were adjusted to her body’s physiological changes and hypoglycemic readings however, hypoglycemia persisted. The patient was admitted to the hospital for supervised monitoring of her glucose levels and insulin administration. Laboratory investigations showed elevated insulin levels and very low C-peptide levels, while no episodes of hypoglycemia occurred during her hospital stay. The patient was then counselled, and she admitted that she administers extra units of insulin as to have “better” control of her disease.

**Conclusion:** After ruling out comorbid conditions, factitious hypoglycemia should be considered in patients with type 1 diabetes.

**A 13-year-old Saudi girl with type 3c diabetes mellitus due to hereditary pancreatitis**

Sahar Badr MD, Zahid Arain MD, Najlaa Jassas, MD. KFSH- Dammam – KSA.

**Background:** Hereditary pancreatitis (HP) is a rare, autosomal-dominant disorder usually presents with acute pancreatitis during childhood. Since it’s similar to other pancreatitis cases, the presence of HP in a family warrants the detection of the defective gene. Type3cDM, is complicated by exocrine pancreatic insufficiency and pancreatic cancer. Patients with HP have a >50-fold increased risk for pancreatic adenocarcinoma and the incidence increases with smoking and DM.

**Objectives:** To describe a rare cause of Diabetes in children, T3cDM as a complication of HP. Also, to highlight the need of a long follow up in children with HP for related endocrine and exocrine complications.

**Case report:** A case of recurrent pancreatitis since the age of 3 years, was complicated by pseudocyst which needed surgery. She was treated with pancreatic enzymes and fat soluble vitamins. Gene study confirmed HP due to mutation in CTRC Gene.

Later, while she was 13 years old she presented to the ER with polyuria, polydipsia, high blood sugar, a positive urine ketone and no acidosis. On examination: She was alert, vitally stable, well hydrated, height on 75th centile and BMI 20 kg/m2. Systemic examination was unremarkable. Biochemical work up revealed elevated Hb A1C of 9% and low lipid profile. Diagnosis of Type3cDM was documented and patient is maintained now on multiple daily injection insulin regimen, diet control and is followed up in both diabetes and gastroenterology clinics.

**Conclusions:** We report a rare case of hereditary pancreatitis due CTRC Gene mutation that developed T3cDM as a complication of chronic pancreatitis. This is one of the few cases reported in the literature highlighting the need of early diagnosis of such cases and long term monitoring for endocrine, exocrine complications as well as pancreatic cancer.

**Frameshift variance in SLC19A2 gene, causing thiamine responsive megaloblastic anemia (TRMA): a case report from Pakistan**

Saima Askari, Mohsina Ibrahim, Asher Fawad, Jamal Raza, Abdul Basit, BIDE, Pakistan.

**Background:** Thiamine responsive megaloblastic anemia (TRMA) syndrome or Roger’s syndrome is a rare genetic disorder (autosomal recessive) usually associated with sensorineural deafness, megaloblastic anemia and diabetes mellitus due to mutations in SLC19A2, encoding a thiamine transporter protein. The active uptake of thiamine into the cells is disturbed in this disorder. The disease onset is typically seen during infancy or at early childhood and most of the TRMA syndrome patients are resulted from consanguineous marriages. Pharmacological doses of thiamine cures/ameliorates the megaloblastic anemia and diabetes mellitus.
Case report: In this case, we report a 2.5-year-old baby boy who was born to consanguineous parents. He was noted to be deaf and mute during his first year of life. He was diagnosed with anemia at the age of 1.3 years and required blood transfusion twice. The cause of anemia was not established and it was attributed secondary to some viral infection. At the age of two years he was diagnosed with diabetes mellitus (DM). The diagnosis of TRMA had made during his evaluations for uncontrolled sugars, sensorineural deafness and anemia. After few weeks of thiamine replacement his hemoglobin increased to normal values, his sugars improved but had no changes in his deafness

Methods: Analysis of all coding regions and exon/intron boundaries of the SLC19A2 gene by Sanger sequencing.

Results: A p, Leu208fs homozygous frameshift variant was identified in the SLC19A2 gene of the patient. It was located on the Exon 2 and DNA description was c.623dup. This variant is predicted to be pathogenic and diagnosis of TRMA syndrome was confirmed.

Conclusions: The diagnosis of TRMA should be kept in mind in differential diagnosis of DM with anemia and or sensorineural hearing loss especially in the populations where the consanguinity is frequent as diagnosis has great impact on management. Moreover, genetic counseling should also be provided.

The patient didn’t read the textbooks

Sami Mushawwah Alanazi,
Pediatric endocrinology fellowship program, King Abdullah specialized children’s Hospital, NGH, Riyadh, KSA.

Background: Multiple causes of widely erratic glycemic control are seen in patients with longstanding type 1 diabetes. A careful history should be performed to explore causes related to diet, monitoring, medications, and activity.

Case report: a 12-year-old girl, was diagnosed with type 1 diabetes mellitus for more than 2 years. At diagnosis, she had positive antibodies (Anti GAD, ICA, Anti insulin Ab), with no impressive family history of diabetes and negative MODY panel. In the last 8 months, the patient was still having high Hba1c ranging between 13-15% despite she reached an insulin dose of 1.7-2 units/kg/day.

She had multiple visits for uncontrolled hyperglycemia as well as recent DKA, and she tried many types of insulin regimen. Lastly, she is now on MDI (Lantus and Aspart). She is totally a normal girl, prepubertal with Tanner stage of 2. She is slim with areas of lipohypertrophy in most of her areas of the injections mainly arms. Her BMI is 16 kg/m². The rest of the clinical examination and systemic review were normal, and she has no other chronic diseases, autoimmune or endocrinopathies.

Last visit to diabetes clinic, the concern of compliance was raised but the mother confirmed that she is the one who is giving her the doses of insulin, and she is using the buttock areas predominantly. The family was counselled for the importance of the admission and to be started on insulin infusions to see the response to IV insulin and how much the difference before to raise any other differential diagnoses.

The first three days the patient was receiving almost 2 units/kg/day of insulin SC, by the primary nurse to check compliance. For the three days all the readings of glucose monitoring were more than 15mmol; giving the impression of either insulin resistance or subcutaneous defects (lipatrophy or dystrophy). The glucose checking were 6-8 times per day. Then the patient was kept on continuous glucose monitoring to monitor glucose values in between these readings which persistently showed high glucose readings too. The patient was shifted from Lantus to Tresiba and insulin Aspart is kept the same to see if there is any subcutaneous regimen could give her chance of improvement, but unfortunately, this trial also failed.

Lastly, the patient was replaced her daily SC doses by continuous regular insulin infusion with these following parameters.

<table>
<thead>
<tr>
<th>Insulin infusion</th>
<th>Glucose level/ mmol</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.025 iu/kg/h</td>
<td>4-10</td>
</tr>
<tr>
<td>0.05 iu/kg/h</td>
<td>10-12</td>
</tr>
<tr>
<td>0.075 iu/kg/h</td>
<td>12.1-15</td>
</tr>
<tr>
<td>0.1 iu/kg/h</td>
<td>15.1 and above</td>
</tr>
</tbody>
</table>

After two days, the patient was showing dramatic improvement with maximum glucose level of 12mmol. The total insulin requirement per day did not reach 1 unit/kg/day. So, at this time the diagnosis of brittle diabetes was raised and the patient was planned for insulin pump therapy. After the adjustment of the proper sites and the basal / bolus doses with insulin pump therapy, 4 months later the patient’s HbA1c dropped to 9% with no significant hypoglycemia.

Conclusion: Uncontrolled diabetes in youth has a wide range of differential diagnosis. Brittle diabetes should be considered for any wide range of insulin requirement between IV and SC doses if the compliance is optimum. There are no clear criteria to diagnose brittle diabetes, but fluctuation of hypoglycemia or recurrent hyperglycemia with or without DKAs with increasing the insulin requirements could raise the index of suspicion to such entity.

Prepubertal Onset type 2 Diabetes mellitus: Case report

Mayada Raya, Rasha Ibrahim, Irfan Siraj, Saleem Bawani, Junaid Khan

Department of General Pediatrics, Rahba Hospital UAE.

Background: The prevalence of childhood type 2 diabetes (T2D) is increasing but prepubertal (T2D) is still unusual.

Case report: We report a case of T2D with onset below 10 years of age. T2D was diagnosed based on the absence of ketosis, good beta cell reserve as shown by C-peptide assay, absence of antibodies, and later by response to oral hypoglycemic agents.

Conclusion: T2D is beginning to be seen in first decade of life. A proper clinical workup of children with diabetes will prevent misclassification as type 1 DM and help avoid unnecessary insulin therapy.

Huda Izzeldin Ahmed, MBBS University of Khartoum

Pediatrics Endocrinology Fellow; Sudan Medical Specialization Board

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Background: Skin disorders affect different populations. Skin disorders in diabetics may be related to autoimmune conditions such as dermatitis herpetiformis associated with celiac disease, or skin manifestations associated with SLE. It may also be a complication of long standing or poorly controlled diabetes like necrobiosis lipoidica diabetorum. Other causes include reactions to certain drugs that used to treat diabetes or diabetic complications like angiotensin converting enzymes inhibitors that used for treatment of diabetic nephropathy.

Case presentation: A 17-year-old female known diabetic for 11 years presented with generalized body swelling and elevated BP and diagnosed as diabetic nephropathy. She was started on Lisinopril treatment and furosemide. The edema subsided but a month later she developed generalized bullous skin eruption and again generalized body swelling. On examination, she was pale. Her blood pressure was not controlled and later she developed ascites. Investigations showed hypoalbuminemia and deterioration of renal function.

Lisinopril was changed to Amlodipine and then she was started on dialysis. Skin histopathology diagnosed her skin condition as Bullous Pemphigoid. Strikingly, there was no development of new bullae since the anti-hypertensive changed to Amlodipine.
Conclusion: Skin disorders in diabetics can be related to auto immune conditions, diabetic complications or drug reaction. Lisinopril (used for treatment of diabetic nephropathy) can be a cause of serious skin manifestation.

Challenges in management of Diabetic Ketoacidosis (DKA) with hypoglycaemia, case presentation

Rawah Mohamed, Manal Mustafa, Latifa Hospital, Dubai, UAE.

Background: Diabetic Ketoacidosis (DKA) in paediatrics remain a common presentation for patients with type 1 diabetes mellitus (DM). The optimal management for DKA should include IV Fluids for correction of dehydration, acidosis and electrolyte abnormalities and administration of insulin infusion. A close observation of the electrolytes, blood glucose and neurological status should always be provided. Hypoglycaemia will remain a real challenge during treatment of DKA with insulin infusion.

Case Report: A 7-year-old girl, known case of Type 1 DM and intermittent asthma. She was diagnosed 5 years ago in Saudi Arabia, on insulin aspart and Insulin Glargine. Presented with URTI symptoms and abdominal pain with vomiting. Her investigations revealed moderate DKA, hence admitted for further management. Started on management according to our hospital protocol. As the family were travelling, insulin glargine dose timing was delayed, and received 3 hours before admission. After starting the insulin infusion, the hourly monitored glucose dropped to 15 mg/dl despite being on the 12.5 % dextrose concertation, she received 1 bolus of 10% dextrose, and however hypoglycaemia persist. Finally, we had to decrease the insulin infusion rate. By the next day she was cured from DKA and blood glucose level stabilized. She remained hospitalized for more 2 days for proper insulin dose adjustment and parent’s education.

Conclusion: Using IV fluids with high glucose concertation in management of DKA in pediatric patients, guided by hourly blood glucose will play a major role in preventing hypoglycaemia. However, reducing the insulin infusion rate should always be the last option, to ensure not delaying the DKA correction.

When Neurofibromatosis Meets Diabetes: A Case Report

Femla Hayek
Rafic Hariri university Hospital, Lebanon University, Lebanon.

Background: Neurofibromatosis is one of the most frequent human genetic diseases with a prevalence of 1 case in 3000 births. It is occasionally associated with autoimmune diseases including type 1 diabetes mellitus. So far, four male cases associated with type 1 diabetes were published with favourable diabetic outcomes.

Case report: Rayan was diagnosed at the age of 4 years with type 1 diabetes and neurofibromatosis because of café-au-lait spots and the presence of intracranial gliomas. The management of her diabetes was difficult to control with several episodes of hypoglycemia leading to seizures and HbA1c around 10%.

CT scan of the abdomen was normal. Adult studies showed increased insulin sensitivity and lower fasting blood glucose in Neurofibromatosis. She developed celiac disease and delayed growth with uncontrolled headache. Cerebral MRA showed hypoplastic left anterior cerebral artery and mild stenosis at the origin of the right middle cerebral artery. As for Rayan’s growth, the parents accepted short stature as a feature of NF1 because the concern about the safety of recombinant growth hormone treatment. GH receptors were demonstrated in neurofibromas and there is increased risk of developing benign and malignant tumors in this pathology.

Conclusion: Increased Insulin sensitivity with lower fasting blood glucose were demonstrated in adult neurofibromatosis.

There is a concern about safety of GH treatment in short neurofibromatosis patient.

Unusual and rare cases of diabetes as part of a larger cohort of consanguineous patients from the north east of Iraq

Tara Hussein Tayeb 1, Shenali Amaratunga 2, Štěpánka Frňová 2, Petra Kučerová 2, Lenka Elblová 2, and Jan Lebl 2.
1 Department of Paediatrics, Sulaymani University, College of Medicine, Iraq.
2 Department of Paediatrics, 2nd Faculty of Medicine, Charles University in Prague, Czech Republic.

Background: Human Genetics is a relatively new field in Kurdistan, Iraq.

Objective: Giving an outline on a collaborative research project between the correspondent author of this article and Pediatric endocrinologists from the 2nd Faculty of Medicine, Charles University in Prague.

Method: The cohort currently involves 39 families, 32 probands with short stature, 3 cases of hyperinsulinism and 4 families with unusual diabetes presentation. All children are patients seen in Sulaymani Governorate. After obtaining written consent, blood was taken from the probands, their parents and siblings. Their family history was taken, family pedigree obtained and relative investigations were taken accordingly. Blood was transported for genetic testing to Genetic Lab of the Pediatric endocrine department of the Motol University Hospital, in the Czech Republic. DNA was examined via whole exome sequencing methods. Detected variants were filtered using bioinformatic software (Ingenuity and Varait) and unpublished variants were evaluated according to their absence in the ExAC database, in-silico prediction programs and the American College of Medical Genetics (ACMG) standards. The identified pathogenic variants were confirmed using Sanger sequencing methods.

Result and Conclusions: Three pathogenic homozygous variants were found in the 4 families with diabetes and other phenotypic features:

1. A 13 year old girl with insulin resistant diabetes and dysmorphic features has pathogenic variant p.Thr937Met (c.2810C>T) in the INSR gene causing Rabson Mendelhall syndrome.
2. An 11 year old girl and her affected brother who both have diabetes and short stature has a novel pathogenic variant p.Ile863Met (c.2589C>G) in the WFS1 gene causing Wolfram syndrome.
3. A 12 year old girl with short stature, non-immune diabetes, hepatosplenomegaly and camptodactyly has a pathogenic variant p.Leu349Serfs*56 (c.1045delC) in the SLC29A3 gene known to cause histiocytosis-lymphadenopathy plus syndrome.
4. In a sibling pair with neonatal diabetes and hypothyroidism, a causative variant has not been found yet.

Most of these cases have phenotypic features challenging the classical presentation of diabetes. We hypothesize that this research will help to find novel mutations which will help in the understanding of the pathophysiology of endocrine diseases in this under-studied population.

GROUP 2

Frequency and risk factors of depression in type 1 diabetes in a developing country

Doaa Khater, Magdy Omar.

Alexandria University, Children’s Hospital, Egypt.

Background: Living with type 1 diabetes, especially in developing countries, can feel overwhelming for parents and children because constant vigilance is required for proper care with an inadequacy of resources.

Aim of the work: To investigate the frequency of depressive symptoms in children and adolescents with type 1 diabetes and their association with demographic, diabetes-specific, and family-functioning risk factors.
**Method:** This study was conducted using Epidemiologic Studies Depression Scale. 86 (42 males and 44 females) patients with type 1 diabetes from Diabetes Clinic in Alexandria University Children’s Hospital, Egypt, have completed the questionnaire during 1 November-31 December 2015. Their mean age was 11.14±3.02 (Range 5.8 - 16.2 year). Logistic regression models were used to detect the predictors of depression.

**Results:** In the current study 44 children (51.16%) had score > 15 indicating depressive state. Children who had depression were found to have significant longer duration of diabetes (5.7 ± 2.5 year), higher mean total daily insulin dose (1.3 ± 0.44 unit/kg), HbA1c level (9.9 ± 1.7) and were less frequently treated with basal bolus insulin regimen (29.6%); P <0.001. Univariate logistic regression model showed that older age (OR, 1.2; 95% CI 1.21 –1.39), having puberty (OR, 0.3; 95% CI, 0.1 – 0.7), lower socio-economic status (OR, 0.19; 95% CI 0.04 – 0.95), having less educated mother (OR, 0.28; 95% CI, 0.08 – 0.96), not on basal bolus insulin regimen (OR, 5.3; 95% CI, 2.1– 13.4), receiving < 3 daily injections (OR, 1.2; 95% CI, 0.27 – 0.55), DKA admission (one OR, 3.6; 95% CI, 1.19 – 11.06), two (OR, 5.1; 95% CI, 1.2 – 21.4), three times (OR, 11.3; 95% CI, 1.8 – 122.5) were independent predictors for depression.

Multivariate logistic regression model adjusted for significant predictors in the univariate model showed that HbA1c is the only significant predictor for depression with statistics of 0.83.

**Conclusion:** Children and adolescents with type 1 diabetes have higher frequency of depressive symptoms in a developing country. Poor glycemic control is the most significant predictor for depression in these patients.

**Screening of children and adolescents with diabetes mellitus for asymptomatic coeliac disease: is it beneficial?**

Marwan Sherif, Ibtisam Hadeed, Abdullah Burwaiss, Nadia Alghazir, Umalmir Alhadi, Suleiman Abusrewil.

**University of Tripoli, Department of Pediatric Endocrinology and diabetes, Tripoli University Hospital, Tripoli, Libya.**

**Background:** Coeliac disease (CD) is common in children and adolescents with type 1 diabetes mellitus; and hence CD screening of all asymptomatic diabetic children is carried out in many countries. While introduction of a gluten-free diet (GFD) might improve glycaemic control, the burden of two dietary regimes is a great challenge.

**Aim:** To assess the short-term effects of the diagnosis and treatment of asymptomatic CD in children and adolescents with type 1 diabetes on their diabetic control and body mass index (BMI), one year before and two years after diagnosing CD and introducing GFD.

**Design:** Observational longitudinal case-control study of 26 diabetic children with CD and 26 diabetic children without CD as controls, matched for age, sex, and duration of diabetes.

**Results:** The age at diagnosis of diabetes mellitus in coeliac group and controls was 6.0±3.98 years and 5.8±3.86 years, respectively (p=0.8). The coeliac cases were diagnosed with CD at 10.3±4.27 years of age. HbA1c levels were 9.76%±2.49%, 9.54%±2.77%, and 9.62%±2.64% in controls, coeliac cases pre-GFD, and post-GFD, respectively. HbA1c did not change in coeliac cases 1 year before and 2 years after introduction of GFD, but insulin requirements and BMI SDS increased significantly. HbA1c values during pre-GFD and after-GFD periods were similar to those of controls with the exception of insulin requirement, which was significantly higher after diagnosis of CD than in controls (1.01±0.27 unit/kg/day vs. 0.94±0.25 unit/kg/day, p=0.009), and BMI in control group was higher than those of both periods in coeliac group. Individual analysis of all values at each time point between cases and controls did not reach statistical significance over the two-year period.

**Conclusion:** This study suggests that diagnosing CD and introducing GFD in diabetic children has no effect on glycaemic control.
After one year, she returned to clinic refusing of insulin therapy intake by her family. She presented with blurred vision, severe weight loss, but no history of hospital admissions from diabetic ketoacidosis. Ophthalmology consultation was undertaken with full investigations which revealed cataract in both eyes, HbA1c 20%, weight 18 kg (severely emaciated) and height 123 cm indicating stunted growth. Intensive insulin therapy was re-initiated in the form of basal-bolus and after 3 months HbA1c level dropped down to 6.4%, operation had been done for cataract in both eyes.

**Conclusion:** The pattern of presentation of type 1 diabetes has changed as the incidence of DKA has decreased. Chronic complications of diabetes, such as cataract or retinopathy, are considered rare but still could be seen in some patients. These complications might be prevented by achieving better awareness of good glycemic control and regular follow up of patients.

**DKA ASSOCIATED WITH STROKE IN A PATIENT TYPE 1 DIABETES MELLITUS**

Hasan Eideh, Pediatric Endocrinologist, Palestinian medical complex – Ramallah.

**Background:** Type 1 diabetes mellitus (T1DM) is a common autoimmune condition that often presents in childhood and may be complicated by episodes of diabetic ketoacidosis (DKA).

DKA is a complication that mostly occurs in association with type 1 DM, and it may be encountered in up to 25% -40% of children with newly diagnosed type 1 DM.

Common precipitating factors are infection, drugs, stress of chronic disease, and psychological trauma. It is characterized by the presence of ketoacids due to insulin insufficiency and it is associated with hyperglycemia, disturbances of fat, protein and carbohydrate metabolism. We have to remember that children can die from diabetic ketoacidosis.

**Case report:** In this context, we are reporting a case with type 1 DM and celiac disease who presented with DKA from Palestinian medical complex. The patient was started on treatment according to DKA protocol; then he was complicated with cerebral edema and hemorrhagic stroke. Upon reviewing the new guidelines for treatment of DKA, we have come across changes in the amount of fluid given, mainly in the degree of dehydration that is used to calculate fluids and option for using intravenous insulin rate 0.05units/kg -0.1 units/kg per hour.

**Conclusion:** One of the most serious complication of DKA is cerebral edema which occurs in 3-10 pediatric patients per 1000 cases of DKA, so prevention of cerebral edema is a must as it could lead to high risk of ischemic or hemorrhagic stroke in children if not properly managed.

Diabetic ketoacidosis itself has been reported to be a risk factor for the occurrence of stroke in children and youth. A cerebral hypoperfusion in untreated DKA may lead to cerebral injury, arterial ischemic stroke, cerebral venous thrombosis, and hemorrhagic stroke. All these were noted following DKA episodes in children.

**Oral Gliclazide (A Sulfonylurea) Monotherapy Is Effective and Safe in the Management of T2DM in Children, a Case Report.**

Ashraf Soliman, Shayma Osman, Noor Hamad, and Nada Alaaraj

Hamad General Hospital, Doha, Qatar.

**Background:** Type 2 Diabetes Mellitus in pediatric patients is usually treated with metformin and insulin.

The use of other oral antidiabetic drugs is not clearly delineated in T2DM in children although potentially useful.

**Case Report:** A -13 year-old girl, presented with polyuria, polydipsia and weight loss (5 kg) for 2 weeks before presentation.

Weight 65.7 kg, Height 152 cm (15th percentile) and BMI 27 (>97th percentile). She had acanthosis nigricans, no goiter.

Laboratory result revealed Blood glucose = 27mmol/l. HbA1C = 11.6 %, insulin level 14.4 uU/ml (n= 20 - 23.uU/ml) and C-peptide= 1.15 ng/ml (n= 0.78-5.19 ng/ml). OGTT using 75 g of dextrose showed: fasting glucose 6.3mmol/l, c-peptide 1.4ng/ml and 2 hours glucose 15.5mmol/l and c-peptide 7.37 ng/ml.

T2DM was diagnosed and she was started on s.c insulin (basal/bolus) (0.6 units/kg/day). After 6 months her HbA1c dropped to 5.9 %. Another Diabetologist investigated the effect of Gliclazide 60mg daily. OGTT on Glyclazide showed FBG = 6 mmol/L and 2h = 7.8 mmol/L.

Insulin was stopped. Readings of blood glucose pre meals were as following: before breakfast before lunch (6.3-6.1mmol/L) and before lunch (6: 6.7 mmol/L) and before dinner (6-6.6 mmol/L).

HbA1c continued to be 5.9: 6.2% in subsequent visits for 1 year. No hypoglycemia or other side effects was reported during this period.

**Conclusion:** Sulphonyl urea (Gliclazide) offers safe long-term control similar to insulin in our adolescent with type 2 DM.

More studies are required to assess the efficacy and safety of its use in large cohort of children with type 2 DM.

**Case Report of a 6-Week-Old Female Presenting With Diabetic Ketoacidosis Due to an Activating ABCC8 Gene Mutation**

Noha Mohamed Ali Kharie, MRCPCH, Arab board of Pediatrics, DCH and Elham Alamir, UAE.

**Background:** Neonatal diabetes (NMD) is a monogenic form of diabetes that occurs in the first 6 to 12 months of life. It is a rare condition accounting for up to 1 in 400,000 infants in the United States. Infants with NDM do not produce enough insulin, leading to an increase in blood glucose. NDM is often mistaken for type 1 diabetes, but type 1 diabetes is very rarely seen before 6 months of age.

**Case Report:** Six weeks old Afagani female was admitted with severe hyperglycemia and ketoacidosis. This was noticed by the mother having polyuria and polydipsia for the last 2 weeks and she has been feeling hungry most of the time and demanding more frequent feeds since the age of 2 weeks.

She was admitted with very high blood sugar and severe dehydration and metabolic acidosis.

The diagnosis of neonatal diabetes with ketoacidosis was established and managed with insulin infusion and intra-venous fluids till her blood glucose levels were normalized and the dehydration and acidosis were corrected and started on insulin long acting insulin glargine and short acting insulin lispro.

Genetic Testing proved to have homozygous ABCC8 mutation. Both parents are heterozygous for the same mutation and are at risk of developing diabetes. In view of the genetic testing results she was started on sulphonylurea (glibenclamide) concomitant with insulin initially till insulin could be discontinued gradually.

**Conclusion:** This genetic diagnosis has therapeutic implications regarding the initiation of sulfonylurea administration as 85% of patients with neonatal diabetes due to ABCC8 gene mutations can be successfully treated with oral sulfonylurea.

**Severe diabetic ketoacidosis with distal hypoperfusion: Case report**

H.Berrani, Z.Imane

Diabetology unit, Children’s Hospital of Rabat.
Background: Ketoadiasis is the most frequent acute metabolic complication of mellitus diabetes.

Case report: A 15 years old girl, admitted in the diabetology unit for an inaugural diabetic ketoacidosis. The protocol of intravenous insulin therapy was applied for 3 days but the capillary glycemia was 5g/l. She had a urinary infection treated by antibiotic therapy. She presented with cyanosis of toes then the fourth day of hospitalization. After treatment of infection and then normalization of hyperglycemia, the cyanosis of the toes disappeared. The hypoperfusion due to severe ketoacidosis may explain the distal cyanosis.

Conclusion: The distal hypoperfusion of extremities is a rare complication of severe diabetic ketoacidosis.

Necrobiosis Lipoidica Diabeticorum
A paediatric case report

Badsher Elnaem.

King Abdullah Medical city, Department of Paediatric Endocrinology, Al-Madinah Al-Munwarah, Kingdom of Saudi Arabia.

Introduction: Necrobiosis lipoidica is a chronic, cutaneous, granulomatous condition with degenerative connective tissue changes of unknown aetiology various aetiological factors have been proposed, poor metabolic control and long durations of diabetes may play a role although there is still controversy. Clinically it is characterized by yellowish-brown, bizarrely shaped, well-demarcated plaque. In > 80% of cases, the pretibial area is the typical site of presentation. It affects about 0.3–1.2% of adult diabetic patients, but it’s very rare in paediatric with few reported cases.

Case report: This is a case of a 10 year old girl with history of diabetes for 9 years poorly controlled with an average HbAlc of 10% who developed an erythematous nodular rash on the lower extremities and abdomen. The lesions were red-brown plaques with well-defined border. Necrobiosis lipoidica was suspected, local treatment with corticosteroid started but no improvement of the lesions.

Conclusion: In paediatrics patients with T1DM, diagnosis of necrobiosis lipoidica may be more challenging but always be taken in consideration in order to avoid misdiagnosis, wrong/late treatment decisions and progression to ulceration.

Eyaid Syndrome and type 1 diabetes mellitus: A case report

Abdullah Ibrahim alzaben, Pediatric Endocrine Fellow, KSA, NGHA, Riyadh.

Mohammed Al Dubayee, Consultant, Pediatric Endocrinology and Diabetes, Division Head, Pediatric Endocrinology. KSA, NGHA, KASCH, Riyadh.

Background: Transaldolase deficiency is a disease characterised by abnormally low levels of the Transaldolase enzyme. It is a metabolic enzyme involved in the pentose phosphate pathway. It is caused by mutation in the transaldolase gene (TALD01)

Case report: Our patient is an 11 years old girl, known case of Eyaid Syndrome – Transaldolase deficiency OMIM #606003 – and diabetes mellitus type 1 ( T1DM ), additionally diagnosed with proximal Renal Tubular Acidosis ( pRTA ). Once this girl presents to the emergency department with mild illness and acidosis, a question would raise its self, is it due to Diabetic Ketaicdosis, or due to missed bicarbonate doses? And to what extent can we blame her pRTA in worsening her condition.

Conclusion: We will discuss briefly the case as it presented to our Emergency Department, review her investigations and management and give an overview about the use of delta ratio (delta anion ratio) in this and similar cases, and the usefulness of delta ratio in assistance guiding the management.

Elevated Liver Enzymes in a Patient with Type 1 Diabetes Mellitus
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Senior Pediatric Resident, Department of Pediatrics, University of Jordan.

Queen Rania St. Amman – Jordan.

Background: Prevalence of elevated liver enzymes is higher in patients with type 1 Diabetes compared to normal population. The causes of elevated liver enzymes are diverse and diabetic patients have their own peculiarities when it comes to elevated liver enzymes.

Case report: Our patient is a 7-year-old girl diagnosed to have type 1 Diabetes in November 2016. She first presented with Diabetic Ketaicdosis, she was admitted and managed accordingly. The patient was discharged home after teaching her parents carbohydrate counting with multiple daily injection regimens using insulin Glargine and Regular insulin.

She presented recently, after losing follow up for 3 years, with poorly controlled blood sugar in the past 3 months along with 4 episodes of Diabetic Ketoacidosis and frequent hypoglycemic episodes. Her last episode of diabetic ketoacidosis was complicated by elevated liver enzymes and hepatomegaly. Her admissions were in a peripheral hospital near her home so she was referred to our centre for further evaluation and blood sugar control.

In our case presentation we unveil the challenge of diagnosing and treating a patient with poorly controlled diabetes and elevated liver enzymes. The differential diagnosis includes infectious, autoimmune, ischemic and diabetes-related causes.

Conclusion: Elevated liver enzymes in a patient with diabetes should trigger clinicians to peruse better blood sugar control in addition to ruling out other causes.

MC4R mutation in a 4-year-old Saudi girl

Mohammed Al Qahtani, KSA.

Background: The most recurrent type of monogenic obesity is caused by mutations in the gene that codes for the melanocortin-4 receptor (MC4R). Expressed primarily in neurons, MC4R is a G protein-coupled receptor and is known to mediate the anorexigenic effects of leptin, reducing food intake and increasing energy expenditure. It responds to α-melanocytement-stimulating hormone (α-MSH) an agonist leading to initiation of receptor activity and restraining food intake, whereas sensitizing with an antagonist agonist-related peptide (AgRP) has the reverse effect.

Case Report: Our patient is a 4-year-old girl, presents with severe and progressive obesity since early childhood. Her birth weight was 3.07 kg. She experienced hyperphagia and rapid weight gain and linear growth throughout infancy and childhood. The patient had a history of obstructive symptoms during sleep. Her developmental history was normal, and her extended family History was negative for obesity. Physical examination revealed weight of 57 kg, weight of 57kg>100%, height: 111 cm >99%, BMI: 47 kg/m² > 140%.

Her genetic study revealed homozygous mutation at MC4R. Unfortunately trials of diet and exercises failed to control her weight.

Conclusion: MC4R Mutation is the most common form of monogenic obesity but unfortunately there is no medical approved yet can help. Adult Trial of liraglutide (GLP-1 RAs) showed good results. Hopefully soon it will be approved for paediatric patients.

ABCC8 gene related Monogenic Diabetes; Transient Neonatal Diabetes followed by Recurrent Hypoglycemia: A Case Report

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Introduction: Neonatal diabetes is defined as hyperglycemia occurring within the first few months of life, lasting more than 2 weeks. It is categorized into permanent neonatal diabetes and transient neonatal diabetes. Transient Neonatal Diabetes Mellitus (TNDM) is a rare genetic form of diabetes with incidence between 1:400,000 and 1:500,000.

Heterozygous activating mutations in the KCNJ11 and ABCC8 genes which encode the Kir 6.2 and SUR1 subunits of the ATP sensitive potassium (KATP) channels that control insulin secretion are the commonest causes of permanent neonatal diabetes and a rarer cause of transient neonatal diabetes respectively.

Case report: A six-year-old Saudi female who was born full term with average birth weight, by uncomplicated C/S delivery. Her mother had gestational diabetes. Postnatal period was uneventful.

At age of 6 months she presented with attacks of seizures and started on antiepileptic medication. At 9 months of age, she developed hyperglycemia and treatment with multiple daily insulin injection was started. Patient had strong family history of diabetes and seizure disorders from the maternal side and one older brother had similar condition. She achieved the normal developmental milestones for her age. On physical examination, she was overweight > 97th percentile, height was on 55th percentile, other clinical exam were unremarkable.

Diabetes associated autoantibodies were negative. Genetic testing (Whole Exome Sequencing) revealed heterozygous variant of uncertain significant in ABCC8 gene chr11p. (Glu628Lys) exon 13. Gradually, her insulin requirement decreased, she achieved better glycemic control, normal HBA1C until hyperglycemia was remitted and the insulin was stopped as well as the antiepileptic drugs. She presented to our clinic, one and half year after stopping the insulin with recurrent episodes of hypoglycemia and was mainly asymptomatic.

Conclusion: This case demonstrates that patients in remission following transient neonatal diabetes can present with unusual manifestation; hypoglycemia. Therefore, follow up for such cases after the remission of TND is important. Moreover, genetic testing is indicated in children who develop diabetes in the first year of life in absence of islet autoantibodies, for treatment and prognosis.
GROUP 3

Comparative Study between Multiple Daily Injections and Conventional Insulin Regimens in Iraqi Children and Adolescents with Type 1 Diabetes Mellitus

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Background: Type 1 diabetes mellitus is the most common endocrine-metabolic disorder of childhood and adolescence. The discovery of insulin in 1922 made a major breakthrough in therapy of diabetes. There are two known insulin regimens, conventional and the basal bolus regimens. While conventional insulin regimen still used in some areas, it is not the preferred regimen. Management is best accomplished by a multidisciplinary team consisting of child, family, physicians, nurse educators, dietitians, and mental health professionals.

Objectives: To assess the effect of basal bolus regimen on glycemic control, risk of hypoglycemia, ketoacidosis, and growth parameters in comparison with conventional therapy in children and adolescents with type 1 diabetes mellitus.

Patients And Method: A six months follow up comparative study had been conducted at the pediatrics clinic of the National Diabetic Center / Al-Mustansiriya University during the period from February 2017 to November 2017. Seventy-two patients with type 1 diabetes had been included, of which 40 on conventional regimen and 32 on basal bolus regimen (multiple daily injections). Patients were followed by HbAlc, body mass index, growth velocity, hypoglycemic and ketoacidosis episodes.

Results: There was a significant increment in body weight in both basal bolus regimen (P< 0.018) group and conventional regimen group (P< 0.001). The basal bolus regimen group had more reduction in HbAlc levels (P< 0.001) and occurrence of diabetic ketoacidosis (P= 0.035) in comparison to conventional group but didn’t differ in body weight increment (P= 0.382), growth velocity (P= 0.99) and occurrence of hypoglycemic episodes (P= 0.673).

Conclusions: In Iraqi children and adolescents with type 1 diabetes, basal bolus regimen was superior than conventional one in reducing HbAlc levels and so achievement of metabolic control without more hypoglycemic episodes or more body weight increment. This must be concomitant with full diabetes team and tools that improve patients’ compliance.

Ramadan Fasting in Adolescents & Young Adults with Type 1 Diabetes

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Background: Ramadan fastig is well watched in Libyan society by nearly 100% of people. This study was carried out during Ramadan month in the year 2018, to see the effect of Ramadan fasting on adolescents and young adults in our center.

Patients and methods: 125 diabetic adolescents and young adults were selected randomly before Ramadan, they were put on Ramadan insulin dose regimen, and were instructed how to manage themselves during the holy month of Ramadan. Age, duration of diabetes, insulin dose, and associated diseases were looked at.

Results: Data were completed on 118 patients, 57 males, and 61 females, mean age was 18 years, and mean duration of diabetes 10 years. 108 completed their fasting without interruption, 6 broke 1 day, 1 broke 2 days, 2 broke 3 days, and 1 broke 4 days.

The main cause of breaking fasting was hypoglycemia, although; some had hyperglycemia, but they managed to complete their fast.

Conclusion: Adolescents and young adults can fast Ramadan safely, provided they are given the right advice, and the right supervision.

Characteristics of autoimmune thyroid disease in African American and Caucasian children with type 1 diabetes mellitus

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2 American Hospital, Dubai.

Background: Patients with Type 1 Diabetes Mellitus (T1DM) are at increased risk of autoimmune thyroid disease (AIT). In the pediatric age group, the prevalence of AIT varies across a wide range (3-50%), depending on the population studied. There is very limited data describing the association of T1DM and AIT disease in African-American (AA) children.

Objective: Characterize the association between T1DM and AIT in AA and Caucasian children presenting to the same medical centre.

Methods: The medical records of 130 AA and 130 Caucasian children with T1DM presenting to the Children’s Hospital of Michigan were reviewed. Data collected included age, gender, and ethnicity, presence of AIT evidenced by positive anti-TPO or anti-TG antibodies, TSH, free T4, anti-islet, anti-insulin and anti-GAD antibodies. Comparison was drawn between the two ethnicities in regards to the prevalence of AIT as well as predisposing factors for the onset of AIT.

Results: 12.3% of AA with T1DM developed AIT versus 23.8% of Caucasian. This difference was statistically significant with a p-value of 0.023. In the Caucasian group, female gender was a risk factor for developing AIT (37.9% in females vs. 12.5% in males, p-value 0.001), while gender was not a significant risk factor for AA patients (p-value 0.790).

The presence of anti-insulin antibodies was a risk factor for Caucasians (p-value 0.024) but not for AAs (p-value 0.185).

Conclusion: Our study shows a significantly lower prevalence AIT in AA compared to Caucasian children with T1DM. Female gender and anti-insulin antibody are risk factors for Caucasians but not in AAs. Differences could be secondary to different genes implication given the different genetic background. Further investigation can lead to a better understanding of T1DM and thyroid autoimmunity in the AA population.

Diabetic Ketoacidosis in children in pediatric emergency department in Algeria: Epidemiological and prognostic aspects.


Néfissa Hamoud Hospital, Algiers, Algeria.

Introduction: Diabetic Ketoacidosis (DKA) remains a common complication of type 1 diabetes. It is the result of a critical relative or absolute deficit of insulin. It constitutes the leading cause of hospitalization for children with type 1 diabetes and is associated with considerable morbidity and a small but preventable number of mortalities.

Aim of the study: To describe the epidemiological, clinical, biological, therapeutic and evolutionary aspects of hospitalized patients for DKA.

Patients and methods: A descriptive retrospective study was conducted from January 2017 to December 2018 including patients hospitalized for DKA in our pediatric service.

Results: The total population of patients was 62 cases 36 % of them had newly diagnosed diabetes. The cause of DKA in the other 64 % who were known cases of diabetes included infections in 32%, a large meal in 16%, a lack of insulin injection in 9.6% and unknown cause in 6.4% of the cases. Fifty percent of patients had consciousness disorder on admission.
The DKA was severe on 50% of patients. The evolution on ISPAD guidelines was favorable in all our patients except one who died by cerebral edema.

**Conclusion:** DKA remains a serious pathology with severe complication requiring urgent care associated with good education of the diabetic patients.

**Donohue syndrome**
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**Background:** Donohue syndrome ([DS]; leprechaunism) is an autosomal recessive disorder of insulin metabolism caused by loss of function mutations in the insulin receptor gene (INSR) which causes severe derangement of insulin metabolic effects and appearance of clinical features of DS that include intrauterine growth restriction (IUGR), dysmorphic features, alternating hyperglycemia/hyperinsulinemia and hyperinsulinemia.

**Case report:** A case of male infant, delivered via caesarean section at 36 weeks gestation due to fetal distress and oligohydramnios, with very low birth weight (1.34 kg). IUGR was detected prenatally. The patient was admitted in the neonatal intensive care unit due to IUGR, atrial septal defect and dysmorphic features that include hypertrichosis, small face, large and low-set ears, prominent eyes, wide nostrils, thick lips, gingival hyperplasia, large mouth, abdominal distension and bilateral inguinal hernias.

Few days after birth, the patient had hyperglycemia alternating with fasting hypoglycemia. Results of critical sample that was taken during hypoglycemic episode showed hyperinsulinemia and very high C-peptide. Those results with distinctive dysmorphic features have led us to suspect DS.

Genetic diagnosis of DS was performed using sequencing of the INSR gene. The patient is homozygous in INSR for c.2437C>T (p.Arg813*) which is a pathogenic variant for DS.

Treatment with recombinant Insulin-Like Growth Factor-1 (rIGF-1) was not available in our institute. We are planning to start such treatment once the medication is available.

**Conclusion:** Donohue syndrome is a rare disorder of insulin resistance, causing a functional defect in insulin receptor function, and affecting the ability of the insulin to bind the receptor. Features include severe hyperinsulinism and fasting hypoglycemia, along with dysmorphic features and severe failure to thrive despite feeding. Diagnosis is confirmed by sequencing of INSR. No treatment has been approved and prognosis is poor, but rIGF-1 has shown some effect in increasing lifespan.

**A case of Type 1 Diabetes Mellitus with Idiopathic Thrombocytopenic Purpura**
Reham Mohammed Ibrahim Atalla.

**Assistant lecturer of pediatric endocrinology at Tanta University, Egypt.**

**Background:** The relation between type 1 diabetes mellitus and idiopathic thrombocytopenic purpura is well known. In the pathogenesis of both diseases, autoimmunization plays an essential role.

**Case report:** A 10-year-old girl with type 1 diabetes mellitus since 3 years complained of epistaxis. By examination, there were purpura and ecchymosis in her body. After investigations were done, the patient was diagnosed as idiopathic thrombocytopenic purpura. The patient had positive titres of anti-platelet antibodies. Due to inefficiency of intravenous gammaglobulins the patient was treated with a steroid therapy, and the platelet counts started to be elevated to safe levels. With start of treatment, episodes of hyperglycemia have appeared as a side effect.

Insulin dose adjustment with steroid was extremely difficult but was modified with meticulous follow up and the girl was released in a good condition. Screening for other autoimmune diseases were performed.

**Conclusion:** There is wide range of association between type 1 diabetes mellitus and other autoimmune diseases. It is always a difficult decision to start steroid therapy while treating a diabetic patient with idiopathic thrombocytopenic purpura.

**Case Presentation: Early Suspicion Can Save Life from a deadly infection**
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**Department of Diabetes and Endocrinology, National Institute of Child Health, Karachi, Pakistan.**

**Background:** Mucormycosis is an acute, relatively rare, often rapidly fatal fungal infection that can be a leading cause of death of young patients with diabetes mellitus (DM) who have poor glycemic control and acute ketosis. Regardless of its significance this fungal infection is not very well delineate among Paediatricians. These infections are comparatively rare and reported in India and Mexico as the lethal fungal infection in young children with type 1 diabetes mellitus.

**Case Report:** In this case, we report two children a girl with the age of 9 years and a boy with the age of 12 years, who were complaining of swelling, tenderness, blackened skin tissue, blister, respiratory distress, vomitting with high grade fever and have been admitted in the previous year to the diabetic unit of National Institute of Child Health, Karachi. Patients were admitted and managed accordingly.

**Method:** Patients were critically examined by a paediatrician and biochemical analysis was performed. Histopathological analysis was also done from the necrotic site.

**Results:** Laboratory investigation at the time of presentation revealed an elevated level of fasting blood sugar level up to 300 mg/dL (normol 100-180 mg/dL), and TLC 33.32×10⁹/L. Histopathology of the infected tissues showed the presence of large, elongated fungal hyphae of Mucormycosis.

**Conclusion:** We report two cases of mucormycosis of diabetic children at a tertiary care hospital. We emphasize on early diagnosis and timely management of this potentially fatal fungal infection to avoid the further spread of contagion, which may lead to high morbidity and mortality. Hence, health practitioners and paediatrician should be familiar with the signs and symptoms of the disease.

**Challenge in the management of KCNJ11 diabetes**
Naif Hamdan, Abdulhadin Habeeb.

Arab Board certificates in pediatric, Associate consultant pediatric department in Prince Mhammed Bin AbdulAziz hospital/ National guard hospital affair. KSA.

**Background:** Neonatal diabetes mellitus (NDM) is a rare genetic condition with an incidence of 1 in 100,000 that presents before 1 year of age. There are two main clinical forms of NDM: permanent NDM (PNDM), which requires lifelong treatment with insulin, and transient NDM (TNDM), which may spontaneously remit and sometimes recurs in the second to third decade of life. In most cases, TNDM and PNDM cannot be distinguished clinically at the time of diagnosis, and genetic analysis needs to be performed.

**Case report:** A -5 -year female diagnosed at 2 month of age with diabetes started on insulin treatment, genetic testing confirmed KCNJ11 mutation started on glibenclamide in another hospital develop hypoglycemia. Mother was over conscious about hypoglycemia requested to stop glibenclamide and re-inject insulin. The following physician suggest glimepiride (Amyral) to be started in a small dose due to hypoglycemia. However, HbA1c increased to 9%.

The child was transferred to us at 4 year old tried to give her back on glibenclamide but mother refused. She was even reluctant to increase the amyral dose. Hence she admitted to hospital to adjust amyral dose, the dose gradually increased without hypoglycemia HbA1c normalized and C-peptide increased.

**Conclusion:** The use of Amyral in neonatal diabetes mellitus due to KCNJ11 has not been reported. The glibenclamide is the main sulfonylurea used for KATP channel neonatal diabetes mellitus.
New Onset of Diabetic Mellitus came with Severe Diabetic Ketoacidosis and Clinical and Radiological Cerebral Edema at presentation
Abdullah Talal, KSA.

Background: In the increasingly expanding population, Diabetes Mellitus accounts for 20-50% of new-onset diabetic patients in young adult population. Diabetic Ketoacidosis (DKA) continues to be the most severe medical emergency requiring admission to Intensive Care Unit.

Case report: A 10 years old girl, who did not to have any past medical history presented to our ER with loss of consciousness. Patient looked sick, unconscious with GCS 6/15, not communicating only none specific sound, eye opening to pain, abnormal extension in response to pain, sunken eyes, severe dehydrated and distressed in form of tachypnea. Glucose level check was high unreadable. Blood gas was as follows PH: 6.84, CO2:14.4, HCO3:2.4.

Brain CT was performed and revealed diffuse effacement of CSF spaces suggestive of brain edema. Our challenge question was do we need to intubate this patient or not and can we give Bicarbonate? Patient was admitted to PICU received mannitol 0.5G/Kg immediately, and treated according to DKA protocol. Patient was not intubated and did not receive Bicarbonate therapy. After 9 hours her lab showed slowly improving acidosis and improved GCS (12/15). After 48 hours, she recovered fully without neurological deficit. Brain MRI done after 1 week and was totally normal.

Conclusion: our case provides clinicians with a refresher on the use of DKA guidelines to guide the fluid therapy, altered sensorium driven by brain edema, and approach to the management of this condition.

A rare cause of Edema in Diabetic patient
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Background: Generalized body swelling in type 1 diabetes mellitus might be a presenting feature of associated comorbidities like celiac disease, nephropathy or thiamine deficiency, however other rare etiologies have been reported.

Case Report: A 15 years old boy presented with generalized body swelling, he is a known case of type 1 diabetes for the last 1.5 years. He was started on premixed insulin twice a day and regular insulin prelaunch. The dose was titrated up to 1.3 unit/kg/day because of uncontrolled blood sugar. He developed lower limbs and periportal swelling with no symptoms suggestive of heart failure, hepatic dysfunction, celiac disease or allergy. Urine was of normal colour. No family history of autoimmune disease.

On examination he was puffy with bilateral lower limb pitting edema with no sign of inflammation, both weight and height on the 10th centile BMI 17.5 kg/m², not pale or jaundiced, blood pressure was on 50th percentile, normal heart and chest examination, abdomen was not distended and liver span of 8 cm, skin was normal, Tanner III puberty. Differential diagnoses at that time included celiac disease, nephropathy, hypothyroidism, liver disease or heart failure secondary to thiamine deficiency. However, all were excluded by examination and investigation.

Investigation showed HB% 12.8 g/dl, MCV 84, normal urine analysis, liver function tests, S. albumin 3.5 g/dl, negative celiac screening and normal Thyroid function test.

Conclusion: Apart from associated comorbidities as a cause of edema in a diabetic patient, other rare aetiology should be considered. A thorough history, physical examination and relevant work up should help in identifying the underlying aetiology and initiating an appropriate plan of management.

DIABETES IN HOMELESS CHILDREN
Mona Mahdi Bashir.

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Background: Homeless children have many problems regarding their health, including: late presentation, deficient history, always there is a suspicion of unknown drug abuse and no family support during their hospital stay. In our country we can add the financial problems. Their exposure to unknown environment and substances abuse may give a very bizarre symptoms and signs that may delay the diagnosis and management. Also, their diabetes presentation and complication may differ from other children.

Case summary: A 17- year old boy, homeless child, presented as newly diagnosed type 1 DM complicated by DKA, treated in PICU for 1 day and his condition was stabilized, but he developed abnormal behaviour that did not settle in 10 days, so he was referred to our endocrinology department. When arrived he was ill , wasted, weak and unsteady, with no neurological deficit, investigated and supportive management was given to stabilize him to be assessed in psychiatric ER. He became more aggressive to the degree that he required medication. His condition was complicated more by seizure, loss of consciousness, with hemodynamic instability.

Conclusion: Different environment and exposure to certain medication will make the management of these children difficult. Much more effort is needed from the government and the community towards these children. Toxicology screening should always be done.

Case Report: Maturity Onset Diabetes of the Young (MODY) in two Bahraini siblings
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Background: Maturity Onset diabetes of the young (MODY) is one of the rare causes of type 2 diabetes in pediatric age group, account for 1 – 2% of all diabetes in children. There are 9 identified gene mutations that result in monogenic diabetes. Almost all reported cases have positive family history of type 2 diabetes in a 1st degree relative. These patients except a mild form of insulin insensitivity, however, all signs of insulin resistant are absent e.g. (a lack of obesity, the absence of acanthosis nigricans, normal triglyceride levels, or elevated or normal high-density lipoprotein cholesterol [HDL-C]). The antibodies are negative, measurable amount of C-peptide with hyperglycemia and absence of ketoacidosis. The diagnosis is made through molecular genetics and identifying the genetic mutation in suspected gene. Even though genetic testing is considered expensive it is of paramount to identify the genetic mutation in each patient in order to optimize treatment plan, predict course of disease and confirm diagnosis in other family members. MODY can be managed by diet only, antidiabetic agent or combination of antidiabetic agents and insulin therapy.

Case report: We report a case of confirmed MODY in two Bahraini siblings who presented to our hospital with incidental finding of high blood sugar reading. Both siblings were asymptomatic at presentation. Family history was positive for type 1 diabetes in the mother, she was diagnosed at the age of 4 years and was on insulin therapy since then. Genetic testing sent for the family, mother and her two kids had heterozygote mutation in INS gene c.188-31 G>A.

Conclusion: MODY is a clinically and genetically heterogeneous group of monogenic disorders causing diabetes in the younger population. Possibility of MODY should be considered in patients whose features are atypical of their diagnostic label? Genetic diagnosis of this disorder has huge therapeutic and prognostic benefits both for patient and family.
GROUP 4

Bed Time Versus Morning Insulin Glargine in Controlling Blood Glucose in Children with Type I Diabetes using Continuous Glucose Monitoring system.

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Background: Strict diabetes control without developing hypoglycemia is considered a challenge in Type 1 diabetes (T1D) management with few studies evaluating the effect of insulin glargine administration time (morning or bedtime) on glucose regulation and/or frequency of hypoglycemia.

Aim: To compare continuous glucose monitoring (CGM) readings and glycemic control in T1D children receiving bedtime versus morning insulin glargine and to assess the value of CGM in improving glycemic control after 3 months.

Methods: This cross-sectional observational study was conducted on 30 pediatric patients with T1D more than 6 years of age receiving insulin glargine (19 at bedtime and 11 in the morning). CGM sensor was applied subcutaneously to the patients for a period of 3-5 days, then the readings of CGM were interpreted.

Results: Mean age of the study group was 12.4 ± 2.7 years, mean age of start of glargine was 6.8 ± 4.1 years and mean glargine dose was 0.495 ± 0.22 IU/kg/d. Total daily dose (TDD) of glargine correlated significantly with glycemic control (r= -0.489, p= 0.006) and percent of glycose readings within average (r= 0.379, p= 0.039). There was statistically significant difference between both groups of glargine timing (bedtime vs morning) regarding the occurrence of nocturnal hypoglycemia (p=0.016). Follow up after 3 months revealed significant improvement in percent of hyperglycemia, blood glucose readings within target average as well as Hemoglobin A1c (HbA1c) (p<0.001).

Conclusions: Bedtime insulin glargine administration was associated with higher incidence of nocturnal hypoglycemia compared to morning dose. CGM use in T1D improved glycemic control and optimizing HbA1c.

Zinc Status in Children with Type 1 diabetes mellitus.

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2 Hevi pediatric teaching hospital, Duhok-Iraq.

Background: Chronic uncontrolled hyperglycemia can cause significant alterations in the status of nutrients and minerals including zinc, and conversely, some of these substances can directly modulate glucose homeostasis.

Objectives: The objective of this study was to determine zinc status based on serum zinc concentration in type 1 diabetic children and adolescents and compare it with that of healthy controls.

Methods: This case-control study was conducted at Duhok Diabetic center in Duhok city/Kurdistan region/ Iraq, during a one year period. Sixty-five patients with type 1 diabetes mellitus aged less than 18 years of both genders were enrolled, and 65 apparently healthy subjects matched for age and sex as control group. From each one a blood sample was obtained for the measurement of serum zinc, and another sample from patients for checking glycated hemoglobin levels.

Results: Among patients and controls; 68 (52.3%) were males; and 62 (47.69%) were females. The mean serum zinc was significantly lower in diabetic patients (53.24 µg/dl), than in controls (60.96 µg/dl). The mean serum zinc was 61.42 µg/dl in patients whose duration of disease was < 1 year, and 42.22 µg/dl in those was > 5 years. The mean plasma zinc level was 65.06 µg/dl in patients their glycated hemoglobin was < 7.9%, and it was 43.53 µg/dl in those was ≥ 10%. It was 48.35 µg/dl and 58.10 µg/dl in patients whose BMI was < 5th, and between 85th-95th percentile, respectively.

Conclusion: Mean serum zinc was significantly lower in diabetic children than controls and in those with duration of > 5 years than those with shorter duration. Glycemic control influence plasma zinc levels in our patients significantly. No statistically significant deference was observed between mean serum zinc level and mean body mass index of patients.

Body mass index in children and adolescent with type 1 DM.

Othman Shawesh, Suleiman Abusrewil.

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Background: Despite improvements in glycemic control and reduced microvascular complications demonstrated with intensive insulin therapy, weight gain is a frequently noted side-effect that may contribute to increased cardiometabolic risk. Weight gain occurring as a result of intensive insulin therapy in patients with type 1 diabetes has been attributed to improved energy utilization and decreased glycosuria, increased insulin administration, and increased dietary flexibility.

Aims: to see the effect of diabetes mellitus (DM) on body mass index (BMI) over 15 years of follow up in children and adolescent treated for Type 1 DM.

Methods: 50 children randomly selected with type 1 DM diagnosed in 2000 were tested for BMI and followed for 15 years, the BMI was correlated for insulin dose, annual HbA1c level, parent education, family history of obesity, and DM and other associated disease.

Results: 50 diabetic children and adolescent [28 boy and 22 girl] were studied at diagnosis, 5 years, 10 years, and 15 years of follow up. Most of the children had normal BMI at diagnosis and throughout the years of follow up. There was an increase in BMI in girls from 7% at diagnosis to 27% at 10 years and 15 years. Insulin dose, HbA1c level, parent education, family history of obesity, and DM and associated disease had no effect on BMI.

Conclusion: Most of the affected subjects have normal BMI at diagnosis and throughout the follow up. It seems that in girls BMI increases with DM duration from 7% at diagnosis and 27% at 10 and 15 years. Insulin dose, HbA1c, parent education, family history of obesity, DM, and associated disease had no effect of BMI.

T2DM in an adolescent female should make you think of other pathologies!

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Background: Type 2 diabetes mellitus (T2DM) is a worldwide epidemic. It is less common in paediatrics compared to adults. Obesity is still one of the leading risk factors. The following case describes an adolescent female that was diagnosed with T2DM found to have polycystic ovary syndrome (PCOS).

The aim of this case report is to raise the awareness of health care professionals in regards the association between T2DM and PCOS in adolescence as the later can lead to significant metabolic and psychological comorbidity.
Case report: A 14 years old female, referred initially due to increased frequency of micturition and her random blood glucose was 14mmol/L. She was previously diagnosed with obesity at age of 2, thought to be related to her reduced mobility following a diagnosis of Macular degeneration in infancy. Positive family history of T2DM (maternal grandmother and 2uncles). Her examination revealed acanthosis nigricans on the neck and armpits. Height -1.7SDS, Weight 2.05SDS, BMI 30.2Kg/m2 (2.7SDS). Her oral glucose tolerance test showed (0 min) glucose 4.2mmol/l and at (2 hrs) 11.5 mmol/l, HBA1c 43mmol/mol and no antibodies. Normal microarrays test. Advice was given to change her lifestyle.

On subsequent visits; Normoglycaemia achieved following weight reduction (BMI1.75), but hair loss was noted, secondary amenorrhoea was mentioned and further investigations showed polycystic ovaries on ultrasound pelvis, Sex Hormone Binding Globulin 24mmol/L(20-126), Oestradiol 241pmol/L, Testosterone 2nmol/L(0-1.5), Androstenedione 10.7nmol/L(0-6), free Androgen Index 8.3(0-4.5), with LH:FSH ratio of 2.14 by which she fulfilled the Rotterdam criteria for diagnosing PCOS.

Conclusion: Type 2 diabetes mellitus can be an eye opener for some underlying pathologies in adolescent females eg. PCOS. Detailed history taking and thorough examination remain the corner stones in reaching appropriate diagnosis. Awareness about the associations that could happen with T2DM is important.

**MUCORMYCOSIS- a rare and lethal complication in type1 diabetes with favourable outcome**

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Background: Mucormycosis is an angioinvasive infection caused by ubiquitous filamentous non seption fungi of the order “MUCORALES”. It is a rapidly progressive fatal infection mostly reported in immunocompromised individuals such as those with poorly controlled diabetes, under nourished or those with defects in phagocyt function. Orbito-rhinocerebral mucormycosis is the most common type of mucormycosis in diabetic patients.

Case report: This case describes a 5.5 years old girl with type 1 diabetes mellitus presenting with rhino-orbital mucormycosis without cerebral involvement. The index patient presented in diabetic ketoacidosis with facial pain and oedema of left half of face, ophthalmoplegia, purulent nasal discharge and black ulceration, with difficulty in swallowing. Swelling was extending up to nasal cavity, hard palate and inferior orbital area. She was a known case of type 1 diabetes mellitus for the past 2months with poor glycemic control. Her blood glucose was controlled on intensive insulin therapy, surgical debridement and histopathologic study revealed non seoptate fungi hyphae although fungal culture was negative. Systemic antifungal (Amphotericin B) non lipophlic was given for 8weeks. She made a slow but steady progress and her wound became clean with healthy granulation tissue followed by reconstructive facial surgery.

Conclusion: The current report emphasizes the importance of having a high index of suspicion when dealing with patients with diabetes presenting with facial pain or cellulitis. The favourable outcome can be achieved by prompt initiation of appropriate medical treatment, good glycemic control, along with surgical debridement to reduce the mortality and morbidity.

**Insulin Resistance Syndromes with Generalized Lipodystrophy.**

Sahar Mirghani, KSA.

Background: Insulin resistance is a reduced glucose-lowering activity of insulin, is either genetic or acquired. Lipodystrophy is one of the monogenic forms of severe insulin resistance and is classified into congenital and acquired, generalized and partial.

Case report: A 13 years old girl complained of skin lesions and discovered to have hypercholesterolemia and diabetes, started treatment with poor response, then referred to endocrine service. Noticed to be different in shape from other family members since early childhood, she have heavy irregular cycle and acne, normal development and average school performance, parents are consanguineous, mother undergone thyroidectomy, no family history of dysmorphism, endocrine or metabolic disease. Examination showed coarse facial features, loss of subcutaneous fat all over the body, acanthosis nigricans, xanthelasmas on extensors of elbows, hypertrichosis, phlebomagny and muscle hypertrophy, abdominal distension and hepatomegaly. Laboratory tests: High lipids, Hba1c, insulin level, liver enzymes, negative Antibody screening for autoimmune diseases, Images: left ventricular hypertrophy, severe fatty liver, polycystic ovary disease, Whole body MRI scheduled. The patient was treated with Metformin, Insulin, atorvastatin, Fibrates, omega 3 and recently pioglitazone with better lipid profile but still poor glycemic control, metrolepitin was recommended to be given.

Conclusion: Insulin resistance in lipodystrophy cases is difficult to manage with the usual medications and is more difficult in children because of the limited options of licensed medications. Recombinant human leptin has good effects on improving glycemic control.

**Hypokalemia Induce Glucose Intolerance in Family with Suspected Channelopathy, A case series**

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Background: Channelopathies is a group of disorders that affect ion channels in different body systems. It is presented with wide ranging of clinical manifestations depending on the affected ion channel. We presented a case series of family members who are sharing the same gene mutation, and they presented with a unique picture of channelopathy which is not previously reported in the literatures.

Case report: A 10-year-old identical female twins, who had history of recurrent presentations to our emergency department with arrhythmia as prolonged QT interval since age of 5 years. Systemic examinations were unremarkable. Investigations showed unexplained recurrent hypokalemia (2.2 - 2.9 mmol/l) associated with transient hyperglycemia (13 - 21 mmol/l) with hyperglycemic symptoms. Hyperglycemia was totally improved after achievement of normal potassium level. HgbA1C was normal. Whole exome sequencing (WES) showed accidentally finding of PLAGL1 gene mutation. Family history showed similar recurrent presentations in multiple members as following: 14-year-old and 12-year-old male siblings had the same clinical presentations of arrhythmia, hypokalemia and transient hyperglycemia. The mother developed similar presentations in addition to gestational diabetes and hypothyroidism on supplement. The father and a 15-year-old sibling are healthy. All the family members underwent genetic study which showed same PLAGL1 gene mutation in all the family members except the father.
Conclusion: Hypokalemia may lead to transient glucose intolerance secondary to decrease insulin secretion, which improved after normalization of potassium level. PLAGL1 gene defect may consider as a new cause of potassium channelopathies.

**Insulin Aspart Unintentional Intoxication in a Teenager: A Case Report.**

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Background: Insulin aspart is a rapid acting insulin with short duration of hypoglycemic action. There are rare reports discuss unintentional insulin aspart overdose in teenager as most of the reports were occurred in mentally disordered or suicidal attempts.

Case report: We report a 13-year-old girl, who is a known case of type 1 diabetes mellitus on pump therapy. She developed high blood glucose (BG) reading of more than 600 mg/dl due to pump malfunction. She wrongly calculated a correction dose of 700 units (7 ml) when to tried to give herself 7 units using insulin syringes when advised on the dose over the phone by her sister, an ER doctor. She presented to our emergency department after 2 hours from the injections time. She was fully conscious and awake with normal vital signs. Initial BG reading was 250 mg/dl, and started in frequent BG monitoring every 30 minutes. Then, BG was decreased gradually till reach 90 mg/dl after 5 hours from the injections when started on dextrose infusion. After that, BG started to decline again while in dextrose infusion till reach the lowest level of 60 mg/dl after 9 hours of the insulin injections, which improved by 1 dose of dextrose10% bolus (2 ml/kg). After 11 hours from the injection, dextrose infusion was discontinued due to no more hypoglycemia, and she was kept on continuous monitoring till completed 12 hours after discontinuation of dextrose infusion.

Conclusion: Insulin aspart intoxication may lead to prolonged hypoglycemic effect. Diagnosis of insulin intoxication is challenging in teenagers. Dextrose infusion considered the standard management of insulin intoxication.

Factitious hypoglycemia in children with type 1 diabetes


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**Conclusions:** Atypical history of recurrent hypoglycemia must be reminiscent of factitious hypoglycemia which can be caused by the child itself especially in the adolescent or one of the parents in the Munchausen syndrome by proxy which is a form of serious child abuse.

**Challenges in management of hyperlipidemia in pediatrics.**

Fathi Abdel Razig.

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**Background:** Familial combined hyperlipidemia (FCHL) is the most prevalent primary dyslipidemia, occurring in up to 1-3% of the general population and in 20-38% of patients with previous history of myocardial infarction. Certain ethnic groups are susceptible to FCHL. However, it frequently remains undiagnosed and its precise definition is a subject of controversy. Management usually requires lipid lowering therapy along with plasmapheresis in severe cases.

We report our experience using IV fluid to improve the cholesterol & triglyceride in siblings with FCHL.

**Case report:** Two siblings, 14 years old female and 9 years old boy, are known cases of familial combined hypercholesterolemia, diagnosed since birth. Another sibling a 29- year-old male has same illness. Off medication, not following up regularly. Their father is a known patient with DM and hypercholesterolemia. Grandfather died suddenly due to heart attack.

Both were admitted to our hospital due to very high triglyceride, for IV fluids therapy, both received above maintenance for few days and discharged home. Regarding the boy; triglyceride level before admission was uncountable (lipophilic sample) and after IV fluid decreased to 22.3 mmol/L and the level of cholesterol was 10.37 and after was 7.3 mmol/L, while the initial triglyceride level was 33.7 mmol/L for the girl and after was 19.06 mmol/L; while the cholesterol decreased from 6.2 to 5.29 mmol/L. Both on Gemfibrozil 600 mg BD and the girl on Atrovastatin 10 mg.

**Conclusion:** Familial combined hyperlipidemia is very challenging and IV fluids could be helpful in the absence of plasmapheresis. Deposits in the organs is one of the long term complications. Acute pancreatitis is difficult to manage.

**A case report of Neonatal Diabetes Mellitus**

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**Background:** Neonatal diabetes mellitus is a monogenic form of diabetes, with insulinopenia resulting from abnormal pancreatic islet development, decreased B-cell mass, or B-cell dysfunction. Sulfonylurea therapy can improve glycemic control and ameliorate neurodevelopment outcomes in patients suffering from neonatal diabetes mellitus.

**Case Report:** This case represents our experience on transferring four patients with genetic mutations from insulin to oral glibenclamide. They successfully discontinued insulin after receiving sulfonylureas with dramatic improvement in glycosylated hemoglobin (HbA1c) and C-peptide.

**Conclusion:** Genetic testing is mandatory for all patients diagnosed with diabetes in the first six months of life. The improved understanding of the disease had revolutionized the diagnosis and it is management with oral sulfonylureas.
Newly diagnosed diabetes mellitus with hepatomegaly

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**Background:** Hepatic glycogenosis is characterized by excessive glycogen accumulation in hepatocytes and represents a complication of poor controlled type 1 diabetes. It can be caused by excessive insulin doses or recurrent ketoacidosis episodes. Mauriac’s syndrome is a rare disease, which includes short stature, growth maturation delay, dyslipidemia, moon facies, protuberant abdomen, hepatomegaly with transaminase elevation. It has become even less common after the emergence of advances on diabetes treatment, but still exists.

**Case report:** This is a 3 years old boy recently diagnosed as type 1 DM admitted as a case of DKA, Responded will to management of DKA:- found to have progressive abdominal distension, weight loss and poorly controlled blood glucose, in examination : severely abdominal distention with hepatomegaly in examination 14 cm with elevated liver enzymes. His abdominal ultra sound showing: Enlarged liver with coarse heterogeneous echo texture, measures 14.8 cm. after improved patient's glycemic control, patient liver enzyme and hepatomegaly much improved.

**Conclusion:** Mauriac’s syndrome should be considered in subjects with brittle type 1 diabetes and hepatomegaly.