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Abstracts

Conference Papers Editors

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(Names are arranged alphabetically)
Introduction

For the past decade the Emirates Diabetes and Endocrine Congress has distinguished itself as the premier meeting in the region, offering researchers and clinicians a unique opportunity to share ideas and explore state of the art science in diabetes and endocrinology. The 10th Congress was held from 27th to 29th February 2020. Indeed, it was one of the last large face-to-face conferences before the global COVID-19 restrictions, attended by over 4300 delegates. The congress maintained its high standards and attracted numerous international and regional experts in the field of diabetes, obesity and endocrinology. Furthermore, the conference scientific committee selected 30 high quality scientific abstracts from local, regional, and international authors to be presented at the conference. Indeed, a large number of abstracts were from UAE, but there were numerous abstracts from Asia, Middle East and Europe covering a variety of topics. The most frequent topics were in the field of diabetes and obesity, highlighting the importance of these conditions in our region and beyond. The free communications covered both current research and clinical practice. We have grouped the accepted abstracts in thematic categories listed below:

Pharmacotherapies for diabetes and obesity
Epidemiology and prevention programs for Pre-diabetes, Diabetes and Obesity
Genetics of obesity
The role of Technology in glycemic management
Mental health programs for people with diabetes
Molecular properties of dietary products and their role in glycemic management
Thyroid metaplasia

We present the abstracts as submitted by the authors of the free communications in the hope of extending the benefit to those who were unable to attend the conference.

Fatheya Al Awadi, Dubai
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An Activating STAT3 Mutation Presenting with Neonatal Diabetes and Nephrotic Syndrome

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Keywords: STAT3, diabetes, nephrotic, hyper IgE syndrome

Introduction and Background: Diabetes mellitus is a metabolic disease characterized by chronically high glucose levels. It is a multifactorial disease can present at any age from birth. An extremely rare form of diabetes mellitus is monogenic diabetes, a subset of which is permanent neonatal diabetes, and is usually suspected if a child is diagnosed with diabetes at less than 6 months of age. The most common mutations in neonatal diabetes in are KCNJ11 or ABCC8 mutations.

Methods: It is a case report. R.S. was delivered at term by normal vaginal delivery. She was a normal for gestational age baby with a birth weight of 2.9 Kg. Both parents are first degree relatives. During neonatal follow ups, she was discovered to have hyperglycemia at age of 35 days of life and had several admissions with hyperglycemia and/or DKA. (The Insulin autoantibodies (IAA) was positive, while other antibodies anti GAD & Anti–Islet cell ICA Antibodies were negative). She was initiated on MDI injection at a dose of 1.2 unit per kg and achieved good glycemic control. At age of 8 years, she presented with generalized body swelling. She was diagnosed to have nephrotic syndrome secondary to minimal change disease. Nephrotic syndrome was treated with steroid and she went into complete remission. She continued on insulin therapy till date and achieved good results. Genetic testing reported heterozygous missense mutation in the STAT 3 gene, p.T716M. This mutation confirms diagnosis of diabetes secondary to an activating STAT 3 mutation. She is presently 14 years with a weight of 52 kgs and height of 160.8 cms. She has an HbA1c of 6.3%. She is still on multiple daily insulin injections of around 57 units per day, almost 1.1 unit/Kg.

Results: We are the first to report in Dubai a case of permanent neonatal diabetes with concomitant nephrotic syndrome secondary to heterozygous missense mutation in the STAT 3 gene in the absence of hyper IgE syndrome.

Discussion: STAT3 stands for Signal Transducer & Activator of Transcription. STAT 3 mutation is commonly associated with Hyper IgE syndrome. Recently, it is reported as a rare new cause of permanent neonatal diabetes. This newly identified mutation leads to hyper-inhibition of the transcription factor Isl-1 and premature pancreatic cell differentiation that leads to a deleterious downstream effect in pancreatic β-cells, hypoplastic pancreases and consequently, to a decrease in insulin expression. This mutation has been linked also to early-onset autoimmune disorders. The literature is scarce in relation to best medical management. However, our case required long term insulin therapy. Nephrotic syndrome with STAT 3 mutation was always associated with Hyper IgE syndrome. Our case is the first up to our knowledge to report nephrotic syndrome associated with STAT3 mutation in the absence of Hyper IgE syndrome.

Conclusion: Activating STAT 3 mutation is a recent form of monogenic neonatal diabetes getting publicity. Additionally, it can increase risk of having another form of autoimmune disease like nephrotic syndrome in our case.

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Anthropometric Indicators of Obesity: A Cross-Sectional Study of Overweight and Obese Patients in a Multi-Disciplinary Weight Management Program in a Private Hospital in UAE

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Keywords: Anthropometrics, weight, obesity

Introduction: United Arab Emirates (UAE) has one of the highest prevalence rates of obesity in the Middle East at 33%
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Introduction and Background: In the past few years social media has become an essential part of our life; a medium used by many as a main source of information. Therefore, as an NGO, we use social media to share the correct and proper information (tips, recipes, facts about diabetes) and we conduct a large campaign throughout the month of November. The campaign is mainly on social media however, it is also implemented on the ground throughout our awareness sessions.

Methods: The campaign followed a user centered design approach including participatory and cooperative design methods. It followed a color coded, easy to replicate method in order to encourage individuals to take part in the campaign and was made up of 4 parts:

Part 1: On November 1, the 23 participants posted a video on their accounts sharing a fact about diabetes, explaining that the color blue stands for diabetes awareness and red for their support for Dialeb. The video then ended with our slogan “Together we Control Diabetes”.

Part 2: On November 14, the participants each posted a photo on their accounts wearing blue and red & challenging 3 friends to post a photo wearing blue and red in order to spread diabetes awareness.

Part 3: On November 14, the participants each posted a photo on their accounts sharing a fact about diabetes, explaining that the color blue stands for diabetes awareness and red for their support for Dialeb. The video then ended with our slogan “Together we Control Diabetes”.

Part 4: Snowball effect – Different individuals continued to share their photos in support of the diabetes cause throughout the month of November and even in December.

Results: The campaign reached 2 million impressions; it gained the attention of the media (9 TV stations & 2 radio stations). It was played in over 30 of our awareness events.

Discussion: People became informed about the alarming rates of diabetes through the different facts that were being shared. They also learned that “Blue” symbolizes the color of WDD and “Red” symbolizes Dialeb’s logo.

Conclusion: The campaign received a lot of attention online as well as offline. It prolonged throughout the whole month of November and even throughout December all across our social media platforms.

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Circulating Lipopolysaccharide-Binding Protein (LBP) as a Marker of Inflammation and Metabolic Syndrome – Related to Insulin Resistance

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Keywords: LBP, Metabolic syndrome, insulin resistance, inflammation

Introduction and Background: Lipopolysaccharide-binding protein (LBP) is a 65-kDa soluble acute-phase protein present in the blood. It is primarily produced by hepatocytes, intestinal epithelial cells and visceral adipocytes. LBP is released in response to exposure to bacterial endotoxin lipopolysaccharide (LPS) and promotes an immune response. This study investigated the association of circulating LBP with the metabolic syndrome associated factors, inflammatory markers and insulin resistance as predictors for type 2 diabetes in human.

Methods: A cross-sectional study was conducted on apparently healthy participants (n = 272) living in Sharjah, UAE. Association of serum LBP (Enzyme-linked immunosorbent assay- ELISA) with inflammatory markers (IL-6, hs-CRP and TNF-α), metabolic syndrome associated factors and insulin resistance (HOMA-IR) were investigated. IL-6 and insulin were measured via electromechanicalisance (ECLA) method, hs-CRP measured by industrial turbidometric assay (ITM) and TNF-α by (ELISA).

Results and Discussion: LBP concentration was significantly elevated in obese subjects diagnosed with metabolic syndrome (metabolic syndrome score ≥ 3). LBP was significantly associated with hypertension, fat mass, waist circumference and body mass index (BMI), which are considered as associated factors to metabolic syndrome (p < 0.05). LBP was strongly associated with hs-CRP and IL-6 (p < 0.0001). LBP was not directly associated with HOMA-IR, however, increased HOMA-IR was associated with elevated IL-6 and hs-CRP. That may indicate the role of LBP as a mediator of low-grade inflammation that leads to increased insulin resistance and the development of type 2 diabetes.

Conclusion: LBP is an inflammatory marker associated with several metabolic syndrome components and may lead to the development of insulin resistance.

Clinical Decision Support Strategies to Deliver Effective Outcomes through Accountable Care in the Management of Patients with Diabetes – Analysis of a Novel Approach for Last Two Decades

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Keywords: Clinical decision, Accountable, Diabetes

Introduction and Background: Diabetes is now considered a global emergency with 463 million people (every 1 in 11) living with diabetes across the World (IDF Atlas 2019). Over 3 in 4 people with diabetes now live in low- and middle-income countries. The mean diabetes related health expenditure per person is now as high as USD 753 in the middle-income countries. Therefore, a novel approach is required to address effective outcomes through stakeholder participations for an accountable care. We evaluated the role of clinical decision support strategies to manage healthcare needs holistically from a long-term basis through an accountable care model with physician, patient and care coordinators as the key stakeholders.

Methods: We evaluated the differentiated clinical approaches in our secondary care set up for last two decades involving the diabetes delivery care program through diabetes trust, polyclinic and philanthropy program approach to provide an equitable approach to address the socio-economic divide.

Results: 5000 patients with T2DM have been screened for diabetic complications (retinopathy, neuropathy and nephropathy) through a self sustained Sardar Trilok Singh Memorial DREAM Trust, resulting in consistency of follow up and identifying complications early. 60 patients per week for last two decades have been managed at polyclinic through shared resources model including insulins that have been sponsored and shared tiffin approaches among the T1DM children to develop a powerful peer to peer connect and bridge the socio-economic gap. Awareness programs were helpful as a de-stigmatisation technique resulting in effective outcomes with consistent glycemic control. This has led to achievement of mean HbA1c of less than 8%. Consistent media campaigns have been actively been implemented to address and demonstrate the adoption of diabetes risk reduction behaviours in community. This approach has led to a prevention of diabetes and delay the progression towards the complications.

Discussion: Population based programs and mass media should be utilised, planned and implemented to drive awareness for continued championing by the community for the adoption of diabetes risk reduction behaviours.

Conclusion: An effective glycemic care can be delivered through an active participation by the physicians, patients and the care coordinators.
6 Comparative Effectiveness of Abelmoschus Esculentus (Okra) and Acarbose in Lowering Blood Glucose: An Experimental Study using Streptozotocin-Induced Diabetic Rats

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Keywords: diabetes, okra, acarbose, Sprague Dawley

Introduction and Background: Diabetes affects about 382 million people globally. Despite progress in management using commercial drugs, cheaper and more effective alternative treatments are still in demand.

Methods: In this randomized, double-blind experimental study, 48 streptozotocin-induced diabetic male Sprague Dawley rats aged 75-90 days old and weighing 150-250 grams were divided into three groups: (1) Experimental group given 300 mg/kg aqueous extract of Abelmoschus esculentus L. (okra), (2) Positive control group given 15 mg/kg acarbose, and (3) Negative control group given 5 mL/kg distilled water. All groups were concurrently treated once daily for 7 days via oral route. Blood glucose levels were measured using EasyTouch® glucometer.

Results: After 7 days, the experimental group and the positive control group demonstrated glucose-lowering effects. However, the decrease in blood glucose from the baseline up to day 7 was statistically significant only in the experimental group (p-value < 0.05). Comparison of the glucose values among all the groups on day 7 demonstrated a significant difference in the experimental group (p value = 0.02). This showed that okra extract exhibited a time-dependent effect.

Discussion: The negative control group showed a continuous elevation of blood glucose levels throughout the experiment. This finding could be explained by the absence of any treatment. As a result, there is progressive destruction of pancreatic β-cells attributed to STZ administration at the beginning of the experiment, and also due to decreased glycogen formation which typically occurs in the diabetic state. In the positive control group, acarbose demonstrated a glucose-lowering effect among the rat subjects, but it was not statistically significant despite the treatment being given at 15 mg/kg which was based on the highest human dose given in clinical trials. This shows that although acarbose does exhibit its glucose-lowering effect as an alpha-glucosidase inhibitor, it has comparatively weak potency compared to other hypoglycemic agents in the market (Katzung, 2015). This then requires the drug to be administered in much higher and more frequent doses over a long period of time. The significant decrease in the blood glucose as demonstrated in the experimental group strengthens the findings in the phytochemical evaluation of Abelmoschus esculentus L. made by Jain et al. that aqueous okra extract given at a dose of 300mg/kg is effective in lowering the blood glucose levels after 7 days of treatment. This also reinforces the findings of Pereira et al. in their study on the biochemical properties of okra that the very high flavonoid content of okra which acts as an α-glucosidase inhibitor results in dose-dependent lowering of blood glucose without toxic effects. Specifically, the glucose lowering effect of α-glucosidase inhibitors can be credited to its mechanism of action in delaying the digestion and absorption of starch and disaccharides.

Conclusion: These findings prove the potential beneficial effect of Abelmoschus esculentus L. (okra) in the treatment of diabetes through its glucose-lowering effect which is comparable to that of the commercially prepared drug acarbose. Thus okra may be used to manage type 2 diabetes in humans.

7 Dermatological Manifestations in Diabetes Mellitus Patients and its Correlation with HbA1c

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Introduction and Background: Permanent and irreversible functional damage in cells of the body due to long-standing diabetes mellitus which may be a cause for various complications. Dermatological manifestation mostly occur after diabetes mellitus but may be the first clinical presenting sign or even precede the diagnosis by many years. Our aim is to correlate the cutaneous manifestation in diabetes mellitus patients with HbA1c.

Methods: Total 200 diabetic patients were included in this study. After taking the informed consent, demographic details, duration of diabetes, complete history, examination of all of patients with onset of cutaneous manifestations, mode of treatment for diabetes, glycemic profile were documented.

Results: Out of 200 patients (42% male and 58% female), mean duration of diabetes 7.6 + 3 years, mean age was 56 + 10.2 years, mean HbA1c was 8 + 2.3 with 68% patients having poor glycemic control. Most commonly observed skin disease was bacterial infection (22%), followed by fungal infection (20%), acanthosis nigricans (17%), diabetic foot (11%), nail changes (8%), viral infections (5%), pruritus (6%) and xanthelasma (4%), acrochordons (4%), necrobiosis lipoidica (2%). Significant correlation of poor glycemic control with bacterial (p = 0.012), fungal (p = 0.005) and viral infection (0.042). Acanthosis nigricans (p = 0.043) and acrochordons (0.031) are more common in females compare to male.

Conclusion: Skin disease like bacterial and fungal infections are more common in patients with poor glycemic controlled type 2 diabetes mellitus patients. Other cutaneous manifestations like diabetic foot and acanthosis nigricans are less common comparatively.
The Effectiveness of Patient-Centered Approach on Diabetic Care

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Keywords: Diabetes Mellitus, shared care, self-management, diabetic education.

Introduction and Background: Diabetes mellitus is a chronic medical disease which lead to a significant morbidity and mortality. Patient-centered diabetic education and active patient involvement constitutes an essential component of the comprehensive diabetic management approach. Objectives: To assess the effectiveness of adding patient-centered diabetic education sessions to the prescribed treatment plan in controlling diabetes and other related cardiovascular risks.

Methods: All referred diabetic patients to the diabetic educator clinic during the period of the study were included. The needs of these patients were assessed and a 30-45 minutes patient-centered educational session was given to all of them based on the Role of Diabetic Educator published by the ADA. These sessions were given to participants in addition to their prescribed plan. Data were obtained at the beginning of the study, 3 months, and 6 months later. Short and intermediate term effects of this educational intervention on the glycemic status and other cardiovascular risks were examined.

Results: One hundred and thirty patients were included in this study with a mean age of 58 years. There was a significant reduction of FBS, TC, LDL, TGS, and HbA1C after 3 months. This difference was even maintained at 6 months. The mean of HbA1C was reduced from 10.2% at the beginning of the study to 8.7% at 6 months. At 6 months, glycemic control was improved for 58% of participants, 37% remained the same, and 5% continued to show deterioration in their glycemic status.

Discussion and Conclusion: This study showed a considerable positive effect of active patients’ involvement and patient-centered diabetic education toward achieving better glycemic control and minimizing the burden of diabetes.

Evaluating Effectiveness of the Freestyle Libre on Diabetes Related Distress among Young Adults with Type 1 Diabetes

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Keywords: Freestyle Libre, Type 1 diabetes, Diabetes Distress

Introduction and Background: To study and explore the intervention of the flash glucose monitoring system (FGMS) on diabetes-related distress (DRD) in children and adolescents with type 1 diabetes (T1D).

Methods: A 12-week prospective study was performed from March 2019 to July 2019 involving 187 children and adolescents (age range 13–19 years; 56.7% female) with T1D who were self-testing their glucose levels using the conventional fingerprick method. At the time of the baseline visit, FGMS sensors were fixed by a trained diabetes educator onto each patient in the study population. A trained interviewer also administered the 28-item T1-Diabetes Distress Scale (T1-DDS) questionnaire to each participant at the baseline visit and again after 12 weeks to determine the T1-DDS score.

Results: Comparison of the baseline (fingerprick) data with data collected at 12 weeks after the patients had switched to the FGMS revealed a significant decrease in the subdomains of the T1-DDS as follows: powerlessness (p = 0.0001); management distress (p = 0.0001); hypoglycemia distress (p = 0.0001); negative social perceptions (p = 0.0001); eating (p = 0.0001); physician distress (p = 0.0001); friend/family distress (p = 0.0001); and total T1-DDS score (p = 0.0001). Similarly, analysis of the data revealed that there was also a substantial drop from baseline to 12 weeks after initiation of the intervention in the clinical variables assessed, such as glycosylated hemoglobin; specifically, there was a considerable decrease after 12 weeks in the frequency of hypoglycemia. Interestingly, the frequency of glucose monitoring also showed an upsweep among users of the FGMS.

Discussion: The findings of this study concur with the outcomes of several earlier studies which reported that a large percentage of patients with diabetes experienced feelings of frustration due to the pressure of disease management and anxieties, fears, and discouragement as well as concerns regarding the potential appearance of complications, irregular blood glucose values, hypoglycemic episodes, and feelings of diabetes-related stress.

Conclusion: Despite the limitations of the present study, we have obtained valuable data on DRD among T1D patients in Saudi Arabia. In conclusion, the results of this prospective study clearly demonstrate that the DDS subdomain scores were reduced after initiation of the FGMS scanning to determine the blood glucose levels. However, further studies are necessary to ascertain if the FGMS system after prolonged and consistent use will provide enhanced results.
From Guidelines to Clinical Practice, Reflections on the Multinational Randomised Trial Investigating the Efficacy and Safety of Insulin Degludec/Insulin Aspart and Biphasic Aspart 30 in Patients with Type 2 Diabetes before, during and after Ramadan

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Aims: To provide clinical evidence reinforcing practical guidance concerning the titration algorithm and dose modification for patients with Type 2 diabetes fasting during and/or outside Ramadan.

Methods: Data were retrieved from a multinational, randomised, treat-to-target trial of insulin egludec/insulin aspart (IDegAsp) twice-daily (BID) (n = 131) vs biphasic aspart 30 (BIAsp 30) BID (n = 132) before, during and after Ramadan in fasting patients with Type 2 diabetes. A structured titration algorithm and dose modification, based on IDF – Diabetes and Ramadan 2016 guidelines, were applied during treatment (8- to 20-week initiation, 4-week Ramadan, 4-week post-Ramadan). Hypoglycaemia was analysed as overall (severe or blood glucose confirmed <3.1 mmol/l) symptomatic, nocturnal (00:01 to 05:59) overall symptomatic or severe (requiring third-party assistance).

Results: Glycaemic control was maintained in both arms during and after Ramadan, regardless of treatment initiation duration. For both treatments, total daily doses rose during titration, and as per protocol (30% to 50% reduction of latest pre-Ramadan breakfast/lunch or evening dose), decreased when Ramadan began and increased to pre-Ramadan level after Ramadan. During Ramadan, IDegAsp was associated with 62% lower overall hypoglycaemia rate (estimated rate ratio [ERR] 0.38 [0.19, 0.77], p = 0.0070) and 74% lower nocturnal hypoglycaemia rate (ERR 0.26 [0.08, 0.88], p = 0.0304), vs BIAsp 30. Post-Ramadan, overall, nocturnal and severe hypoglycaemia rates were IDegAsp: 78.6, 44.9 and 0.0 per 100 patient-years of exposure (PYE) respectively; BIAsp 30: 821.7, 142.4 and 32.9 per 100 PYE respectively.

Conclusions: This study provides clinical evidence that reinforces recent practical guidance for patients with Type 2 diabetes who fast during and/or outside Ramadan.

The FTO Genetic Variants are Associated with Dietary Intake and Body Mass Index Amongst Emirati Population

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Keywords: FTO, Obesity, Emirati, BMI, dietary intake, food predilection, rs9939609, rs9930506

Introduction and Background: The risk of obesity is determined by complex interactions between genetic and environmental factors. Little research to date has investigated the interaction between gene and food intake. The aim of the current study is to explore the potential effect of fat mass and obesity associated protein gene (FTO) rs993609 and rs9930506 single nucleotide polymorphism (SNP) on the pattern of food intake in the Emirati population.

Methods: Adult healthy Emirati subjects with Body mass index (BMI) of 16–40 kg/m\textsuperscript{2} were included in the study. Genotyping for FTO rs993609(A>T) and rs9930506(A>G) was performed using DNA from saliva samples. Subjects were categorized according to the WHO classification by calculating the BMI to compare different classes. Dietary intake was assessed by a sixty one-item FFQ that estimated food and beverage intakes over the past year. The daily energy, macronutrient, and micronutrient consumption were computed.

Results: We included 169 subjects in the final analysis (mean age 30.49± 9.1 years, 57.4% females). The mean BMI of the study population was 26.19 kg/m\textsuperscript{2}. Both SNPs were in Hardy Weinberg Equilibrium. The rs993609 AA genotype was significantly associated with higher BMI (p = 0.004); the effect was significant in females (p = 0.028), but not in males (p = 0.184). Carbohydrate intake was significantly higher in AA subjects with a trend of lower fat intake compared to other genotypes. The odds ratio for the AA was 3.78 in the fourth quartile and 2.67 for the A/T in the second quartile of total carbohydrate intake, considering the first quartile as a reference (95% CI = 1.017–14.1 and 1.03–6.88, respectively). Fat intake was significantly lower in the FTO rs9930506 GG subjects. The presence of FTO rs9930506 GG genotype decreased the fat intake in subjects with FTO rs9930506 AA (p = 0.037).

Discussion: In our study, MAF of rs 9939609 and rs 9930506 genotypes were detected in 15.9% and 20.7% of the subjects, similar to our previous study in the UAE. FTO rs 9939609 AA genotype was significantly associated with high BMI, in line with other studies. Females showed a significant difference in BMI according to genotype. The AA genotype of rs 993609 was significantly correlated with high carbohydrate lower fat foods. If combined with rs 9939506 G/G genotype of the rs 9939506 there is significantly less fat intake in AA genotype group. Such SNP interaction is first to be reported in the current study. In contrast to previous studies, AA allele is associated with higher carbohydrate and lower fat
intake. Environmental changes may modify the effect of FTO genotype on BMI by modifying the penetrance of genetic risk factors, leading to diverse phenotypes.

**Conclusion:** The results of this study highlight the interaction of the FTO risk alleles on the food intake in Emirati subjects. The FTO rs9939609 AA subjects had higher carbohydrate and lower fat intake. The latter was accentuated in presence of rs9930506 GG genotype.

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**Hemodinamic Specifics in Patients with Excess Weight and Obesity with Various Tissues Insulin Sensitivity**

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**Introduction:** hypertension is a socially important pathology that is recently reported in overweight individuals of varying severity grades. One of the pathogenetic factors for its development in this category of patients is possible insulin resistance. Therefore, for the early diagnosis system development it is relevant to determine the parameters that would be informative about the early diagnosis of hemodynamic disorders for individuals with overweight and obesity, which occurred with a decrease in the sensitivity of peripheral tissues to insulin.

**Objective:** To determine in individuals with excess body weight and obesity the nature of correlation relationships between basic hemodynamic parameters and insulin sensitivity.

**Materials and Methods:** 1377 residents of Ukraine over the age of 18 years (men / women = 739/638) examined stroke volume (SV), cardiac output (CO), stroke index (SI), cardiac index (CI), systolic blood pressure (SBP)) and diastolic blood pressure (DBP), HOMA-IR. Insulin resistance was diagnosed in individuals who had a HOMA-IR value greater than 2.77.

**Results:** It was determined that in individuals with insulin resistance SV was registered on the average (84.57 ± 18.53) ml; CO - (6.14 ± 1.27) ml / min; CBP - (126.64 ± 10.8) mmHg; DBP - (77.61 ± 8.49) mmHg. For individuals with normal insulin sensitivity these parameters were recorded at (76.04 ± 20.90) ml; CO - (5.41 ± 1.20) ml / min; CBP - (120.57 ± 13.45) mmHg; DBP - (75.20 ± 8.06) mmHg. In the analysis of the obtained data, the correlation of insulin resistance to the levels of SV, CO, CBP and DBP confirmed the statistical difference at p <0.001 of these parameters in groups of individuals with insulin resistance and with normal insulin sensitivity. No association between CI, SI and HOMA-IR.

**Conclusion:** The obtained results allow us to determine that the parameters of SV, CI, CBP and DBP are the most sensitive markers of the presence of hemodynamic changes in the bodies of people with excess weight regarding the possible development of hemodynamic disorders due to the insulin resistance.

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**Incidence, Clinical Characteristics and Histopathological Correlation of Atypia of Undermined Significance in a Tertiary Center in UAE**

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**Keywords:** Thyroid Nodules, Bethesda classification, fine needle aspiration, atypia of undetermined significance

**Introduction and Background:** Bethesda classification of thyroid nodules cytology is an agreed upon method of classifying thyroid nodules according to risk of malignancy. Among them, Bethesda class III (Atypia of Undetermined Significance AUS) has been a topic of great controversy. The reported estimated risk of malignancy associated with it varies in different studies. Our study investigates the associated incidence of malignancy in the population of UAE.

**Methods:** Data were retrospectively collected over a 10 year period from January 2009 till December 2018 for cytology diagnosis of AUS. Cases were assessed for method of management and follow up. Histopathological diagnosis was documented for operated cases.

**Results:** A total of 180 cases were labeled Bethesda III (AUS) with a mean age of 45.09±14.7 years. One hundred cases (55.6%) of them underwent surgical resection and histopathological diagnosis was obtained. Among the operated cases, 46 were benign and 54 were malignant. Papillary thyroid cancer was the most common malignancy, seen in 39 (72.2%) of cases, and follicular cancer was the second most common, seen in 13 (24.1%) cases.

**Conclusion:** The findings highlighted in our study, suggest a higher incidence of malignancy in Bethesda III category than previously reported. It also puts in question the utility and benefit behind keeping a time gap and repeating FNA as previously recommended.

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**Liraglutide 3 mg for the Treatment of Obesity: Real Life Experience of Use in a Large Emirati Population**

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**Keywords:** obesity, liraglutide, pharmacological

**Introduction:** Obesity is a global health problem and pharmacological treatment options are limited. To assess the efficacy and tolerability of liraglutide 3 mg in routine clinical practice as a treatment for obesity in Arab patients.
Methods: We prospectively collected data on the use of liraglutide 3 mg combined with a calorie deficit diet and exercise in patients who were obese and non-diabetic.

Results: Between 1st January 2017 and 30th April 2018, 2,092 patients were dispensed liraglutide 3 mg as part of routine care and had both pre- and post-treatment weight records. Mean age was 38 years and 75% were females. Median baseline weight was 99 kg, BMI 37.5 kg/m². 188 (9%) had previous bariatric surgery. 787 patients were treated for ≥16 weeks with a median duration of treatment of 213 days. Median (interquartile range) weight loss was 6.0 (2.4-9.4) kg, equivalent to 6.4 (2.5-9.7)% of baseline weight (p<0.0001, n = 787). 474 (60%) of the patients treated for ≥16 weeks achieved a weight loss of ≥25% of baseline weight while 182 (23%) achieved ≥10% weight loss. In the 91 patients who were treated for at least 365 days, 51% achieved a weight loss of ≥5% and 25% achieved a weight loss of ≥10%. In the 39 patients aged between 16 and 18 years, a mean weight loss of 5.5 kg, equivalent to 5% of baseline weight was achieved, which is similar to the whole cohort. There was no difference in percentage weight loss between post-bariatric surgery (n = 76) and non-surgical patients (n = 711). There were small improvements in several cardiometabolic parameters including systolic BP, lipids and liver enzymes. 140 (6.7%) of the patients stopped treatment as a result of adverse events, mainly gastrointestinal symptoms. One patient developed acute pancreatitis in the context of gallstone disease but made an uneventful recovery.

Conclusion: Liraglutide 3 mg was well-tolerated and resulted in weight loss in routine clinical care similar to that seen in randomized controlled trials.

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Mental Health and Type 1 Diabetes: Integrating Psychosocial Support Groups into the Treatment Plan
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Keywords: Mental Health, Type 1 Diabetes, Diabetes, Psychosocial Support, Support Groups.

Introduction and Background: The topic of mental health has received a lot of attention from both the medical and social sciences fields as it is progressively being tied to the physiological state of individuals. The study includes both qualitative interviews and quantitative results collected from healthcare professionals and people living with T1D.

Methods: Qualitative interviews were held with 4 healthcare professionals (2 endocrinologists and 2 nurses working with T1D patients) and a survey was filled by 12 participants living with T1D (all of whom attended support group sessions for T1D).

Results: People Living with Type 1 Diabetes: 83.3% of the quantitative sample believes that people living with T1D, they are more likely to face mental health issues. 33.3% shared that they’ve been diagnosed with a mood disorder (depression or bipolar disorder) and 25% shared that they’ve been diagnosed with an anxiety disorder. 100% of the participants believe that support group sessions should be integrated into the treatment plan of people living with T1D and would recommend it. Health-care Professionals: 100% of interviewed healthcare professionals believed that it would be beneficial to include support group sessions in the treatment program of people with T1D. All interviewees shared that they have encountered cases of people with T1D experiencing diabetes burnouts. They agreed that each case is different, and that listening is key. They all considered referring their patients to specialized assistance, including support groups. 75% of the healthcare professionals believed that using a mental assessment scale would be beneficial to identify if there is a need for additional services or interventions.

Discussion: Both people living with T1D and health care professionals that treat them acknowledge the importance of integrating mental health services in the treatment plan of people with T1D. All participants felt like people with T1D are more prone to experiencing mental distress and should have access to the needed psychosocial support.

Conclusion: It is greatly advisable that medical care professionals perform a simple assessment with patients with T1D, in order to assess their mental health. This can be done in informal or formal matters. If patients exhibit worrying signs, then they can be referred to psychosocial support services designed for people with T1D. Support group sessions, for example, have been found to be very effective in improving mental health for people with chronic illnesses.

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The Molecular Basis of the Anti-Diabetic Properties of Camel Milk
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Keywords: Diabetes, camel milk, insulin, insulin receptor, BRET, cell signaling

Introduction and Background: Camel milk has been reported to have anti-diabetic properties in many in vitro and in vivo studies but the molecular basis of such beneficial properties are still elusive. Recently, camel milk whey proteins (CWP) have been shown to positively affect the activity of the human insulin receptor (hIR) in cell lines.

Methods: In this study, we profiled crude CWP and their hydrolysates for their pharmacological and functional effects on hIR activity and its downstream signaling in both human embryonic kidney (HEK293) and hepatocarcinoma (HepG2) cell lines. For this, bioluminescence resonance energy transfer (BRET) technology was used to assess hIR activity in live cells and the phosphorylation status of hIR and its key downstream signaling proteins, protein kinase B (Akt) and the extracellular signal-regulated kinases (ERK1/2), was also analyzed in parallel. Moreover, glucose uptake was examined in order to link our data to more integrated cell response and to the hypoglycemic effects of camel milk.
**Results:** Our data clearly demonstrate the biological activity of CWP s and their hydrolysates, by promoting hIR, Akt and ERK1/2 phosphorylation in both HEK293 and HepG2 cells. In addition, our BRET assay confirmed the positive pharmacological action of CWP s and their hydrolysates on hIR activity in a dose-dependent manner. More interestingly, the combination of CWP s and their hydrolysates with insulin revealed an allosteric modulation of hIR that was drastically abolished by the competitive hIR-selective peptide antagonist S691. Finally, such effects on BRET and kinase phosphorylation were nicely correlated with an increase in glucose uptake in HepG2 cells.

**Discussion:** This clearly demonstrates the implication of hIR activation in the effects of CWP s and their hydrolysates.

**Conclusion:** Our data reveal the pharmacological effects of camel milk proteins on hIR activity and function. This provides for the first time the molecular basis of the anti-diabetic properties of camel milk that was unknown until now.

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**Methods:** Patients with diabetes and chronic DFUs were randomized (double blind) to either active TWO2 therapy or sham control therapy, both in addition to optimal SOC. The primary outcome was the percentage of ulcers in each group achieving 100% healing at 12 weeks. A Group Sequential Design was utilized for the study with three predetermined analyses and hard stopping rules once 73, 146 and ultimately 220 patients completed the 12-week treatment phase.

**Results:** At the first analysis point, superiority was achieved with the active TWO2 arm being shown to be significantly superior to the sham arm (41.7% vs 13.5%, p = 0.007) with an OR = 4.57, (97.8% CI 1.19, 17.57) p = 0.010. The active TWO2 arm demonstrated more than 3.5 times the likelihood to heal DFUs over 12 weeks compared to the sham arm with a HR = 3.64, (97.8% CI 1.11, 11.94) p = 0.013. At 12 months post enrollment, 56% of active arm ulcers were closed compared to 27% of the sham arm ulcers (p = 0.013).

**Discussion:** Topical Oxygen Therapy has been reported to improve healing of DFUs in several earlier prospective randomized studies. However, these studies suffered from methodological weaknesses, such as a lack of blinding, uncontrolled standard-of-care, or inappropriate analyses of the ITT populations. The present TWO2 study has demonstrated in a randomized, sham controlled trial, that cyclical pressurized topical oxygen therapy adjunctive to optimal SOC is significantly superior to standard care alone in healing recalcitrant diabetic foot ulcers within a 12-week home-based treatment period. To this end, trial enrollment was terminated at the first predetermined analysis point since the primary endpoint had been achieved after the initial 73 randomized patients had completed their 12-week treatment phase.

**Conclusion:** This sham-controlled, double blind RCT demonstrates that, at both 12 weeks and 12 months, adjunctive cyclical pressurized TWO2 therapy was superior in healing chronic DFUs than optimal SOC alone.

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**Results:** Our data reveal the pharmacological effects of camel milk proteins on hIR activity and function. This provides for the first time the molecular basis of the anti-diabetic properties of camel milk that was unknown until now.

**Discussion:** This clearly demonstrates the implication of hIR activation in the effects of CWP s and their hydrolysates.

**Conclusion:** Our data reveal the pharmacological effects of camel milk proteins on hIR activity and function. This provides for the first time the molecular basis of the anti-diabetic properties of camel milk that was unknown until now.

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**Methods:** We enrolled 238 MS patients in the study, male patients represented 39.1% (n = 93) while females accounted for 60.9% (n = 145) (male:female ratio 0.64). The mean age of the study population was 32.07 ± 7.93 years. The mean duration of the disease was 7.06 ± 4.7 years. We determined that 89.9% (n = 214) of the patients showed mild to severe depression symptoms (55.46% of the females, and 34.4% of the males; p = 0.474). We further found that 37.39% (n = 89) and 65.13% (n = 155) of the depressed patients were unemployed (p = 0.039) and were non smokers (p = 0.097) respectively. Furthermore, depression severity is significantly associated with education (p = 0.005).

**Discussion:** Multiple sclerosis (MS) is a serious chronic autoimmune disorder of the central nervous system of unknown etiology. MS-related depression is a common mood disorder recognized within the medical community. However, their association is ambiguous, underdiagnosed, undertreated and widely less reported. The study aimed to estimate the point prevalence and severity of depression among multiple sclerosis patients in Saudi Arabia.

**Methods:** We conducted an observational cross-sectional study among multiple sclerosis patients in Riyadh region, Saudi Arabia. Patients filled demographic data and Patient Health Questionnaire-9 (PHQ-9) to determine depression. Those who did not meet the age, disease duration, and regular follow up eligibility criteria were excluded from the study.

**Results:** We enrolled 238 MS patients in the study, male patients represented 39.1% (n = 93) while females accounted for 60.9% (n = 145) (male:female ratio 0.64). The mean age of the study population was 32.07 ± 7.93 years. The mean duration of the disease was 7.06 ± 4.7 years. We determined that 89.9% (n = 214) of the patients showed mild to severe depression symptoms (55.46% of the females, and 34.4% of the males; p = 0.474). We further found that 37.39% (n = 89) and 65.13% (n = 155) of the depressed patients were unemployed (p = 0.039) and were non smokers (p = 0.097) respectively. Furthermore, depression severity is significantly associated with education (p = 0.005).
Discussion: The medical care has a lot to be reviewed and improved within the framework of the association between chronic diseases and psychiatric disorders such as depression. Our approach differs from others in the literature since it operates a modified screening tool dedicated to the illness severity. In addition, the prevalence of depression in our model of MS patients was high probably because of maltreatment or failure of pharmacological and non-pharmacological means during the management plan. Lastly, our results show that higher level of education had a positive correlation with depression severities, which contradicts existing literature.

Conclusion: High levels of depression symptoms were found among MS patients in Saudi Arabia. The relationship between MS and psychiatric conditions exists despite the uncertainty of its pathogenesis. Further longitudinal studies should be carried out to obtain more valid outcomes. Neurologists treating MS patients can play a role in studies related to the condition by investigating depressive symptoms actively and providing the data.

Nigella Sativa a Promising Drug in Treatment of Diabetes and Prevention of Its Complication

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Keywords: Nigella sativa, Type 1 diabetic patients and hypoglycemic effect Nigella sativa seeds. Glycosylated hemoglobin (HbA1c)

Introduction: Nigella sativa (NS)- an annual herb belongs to the family Ranunculaceae– has been used as a remedy for many diseases. Many researches revealed its medicinal properties including antidiabetic, antioxidant and antidiyslipidemic activities with a large margin of safety. Diabetes mellitus has high morbidity and mortality. Rapidly increasing pervasiveness worldwide needs to be encountered by increase in research to help lessen pervasiveness as well as reduce its complications.

Aim: This study was conducted to validate hypoglycemic effect of NS on type 1 diabetic patients and safety of the seeds.

Methodology: 70 type 1 diabetic patients of both gender, aged 5-17 years with type 1 diabetes were included in the study, divided into NS group include 31 patient they were given NS(2gm per day) in addition to their conventional medicines-- insulin - for 90 days and control group (39pt) ws treated with insulin only. At day zero (prior to commencement of treatment) and at the end of the study (90 days), fasting blood glucose (FBG); glycosylated hemoglobin (HbA1c), serum urea and creatinine were checked then data was analyzed by paired t-test using Statistical Package for the Social Sciences (SPSS software) version 22.

Results: There was a significant reduction in FBG and HbA1c the P value were (0.000 and 0.003) respectively. On the other hand no significant changes in FBG and A1c were observed in the control group using insulin only the P value were (0.21and 0.95) respectively. Reduction in serum urea and creatinine was insignificant.

Conclusion: Our study confirmed that NS has hypoglycemic property which is reflected by reduction in both FBG and HbA1c. Non-significant alteration of urea and creatinine validate the safety of the seeds.

The Obesity Epidemic and Eating Behaviour: Are Diets The Answer? Gulf Eat-ology Research Group (GERG)

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Keywords: obesity- behaviour modification- diets

Introduction and Background: The “Globesity” epidemic is directly linked to type 2 diabetes, cardiovascular risks and escalating health care expenditures making it a critical public health priority. Unfortunately, diets have limited short term benefits with lack of sustainability. Besides their restrictive nature, there are complex personal behaviours and social factors affecting food ingestion that current day “diets” do not address. Data from our multicentre study, aimed at understanding such eating habits in overweight individuals, demonstrates some of these pitfalls. Thus for effective and sustained weight loss, diet interventions must focus on behaviour modification. A recently published novel “concept” highlighting some of these essential elements will be described.

Methods: This study aimed to uncover eating behaviour patterns in overweight and obese individuals in primary, secondary and tertiary facilities in United Arab Emirates. A questionnaire was administered to adult patients with BMI > 25 attending outpatient services.

Results: Only 30 % of subjects described feeling their hunger pangs in the upper abdomen with the rest sensing it in the mouth, throat, head or mid-lower abdomen. The impetus to eat was based on hunger in only 37% whereas according to pre-set meal timings in 43%. In addition, cravings contributed to meal decisions in 20% of meals and 33% of snacks. Moreover, 46% consumed their meals in 5 to 10 minutes and 85% in 20 minutes or less. The foods...
Eating behaviour is introduced as a novel behaviour modification process. Moreover, given the significant challenges to present day life-long adoption of the acquired eating behaviour changes.

Essential 7 addresses “how to eat?” raising awareness to the rate of food consumption, speed feeding triggers and imparting techniques to address them thus heightening the meal experience and food enjoyment. Essential 4 addresses “how much to eat?” enabling the recognition of the culprits for overeating and associated physical and psychological cues. It also introduces a change to the consumption target, strategies to overcome overeating triggers and practice portion control. Eat-ology Essentials 5 and 6 address “how to eat in pairs and in groups?” through facilitating an appreciation for the body’s innate gastro-intelligence and facilitates the development of heightened awareness for internal cues to guide meal choices, timing and quantity of food consumed. It essentially helps individuals uncover their own eating Errors and acquire skills to convert these into eating Essentials which are reinforced by practical exercises allowing long-term adoption. Eat-ology Essential 1 addresses “when to eat?” focusing on imparting an appreciation for the body’s innate gastro-intelligence and how it can be rediscovered. Essential 2 addresses “what to eat?” and instructs on how to differentiate internal vs external origins for cravings, recognize and integrate post- meal feedback to guide future meal consumption. Eat-ology Essential 3 addresses “how to eat?” raising awareness to the rate of food consumption, speed feeding triggers and imparts techniques to address them thus heightening the meal experience and food enjoyment. Essential 4 addresses “how much to eat?” enabling the recognition of the culprits for overeating and associated physical and psychological cues. It also introduces a change to the consumption target, strategies to overcome overeating triggers and practice portion control. Eat-ology Essentials 5 and 6 address “how to eat in pairs and in groups?” through facilitating an appreciation for the important influences of social relations on eating behaviours and the long term adoption of dietary changes. This simple methodology transforms the “way of eating” by uncovering individual eating errors and turning them into eating essentials through simple, easily- applied principles facilitating weight loss and its long-term sustainability.

21 Prevalence of Prediabetes among the Young Female Student Population of Gulf Medical University

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Keywords: Prediabetes, female, young-adult, UAE, HbA1c, Prevalence

Introduction and Background: Diabetes mellitus has become a major health problem worldwide. Prediabetes is a risk factor for Diabetes mellitus. Studying the prevalence and risk factors in young adult population can help to develop and design targeted health education campaigns to delay or reduce the risk of development of diabetes early in this population.

Purpose: To determine the prevalence of prediabetes in the young female population (age 17-32 years) at the Gulf Medical University and to study factors associated with risk for prediabetes including BMI, waist circumference and fasting blood sugar.

Participants and Methods: It was a small pilot study (N = 80) conducted among young female student population in the Gulf Medical University. Ethical approval was obtained from the Institutional Review Board of the Gulf Medical University. A questionnaire was prepared to obtain data regarding age, family history and lifestyle factors. Anthropometric measurements and Blood pressure were measured for the participants. HbA1c and Glucose levels were measured in the blood. Prediabetes was diagnosed according to American Diabetes Association guidelines as HbA1c between 5.7% and 6.4%, or fasting blood glucose levels between 100 mg/dl and 125 mg/dl. Data was entered to EXCEL sheet and transferred to SPSS software version 24. Descriptive and inferential statistics was used to determine the prevalence of prediabetes and to identify associated factors.

Analysis and Results: The prevalence of prediabetes was 6.3% (N = 5) based on HbA1c test as well as the fasting blood glucose levels. HbA1c correlated significantly with BMI and Waist Circumference. 4 out of the 5 participants who were found to be prediabetic were overweight or obese based on the waist circumference of ≥ 88 cm.

Conclusions: The overall prediabetes prevalence, in the young adult female population in Gulf Medical University, is 6.3%. The high prevalence of prediabetes in the young female population highlights the need to test and diagnose it, as well as the need for more awareness regarding diabetes and obesity and the preventive measures in this population.
Prevalence of Undiagnosed Type 2 Diabetes Mellitus and Prediabetes in United Arab Emirates

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**Keywords:** Diabetes mellitus Type 2, Prediabetes, Diagnosis, Fasting Blood Glucose

**Introduction and Background:** United Arab Emirates (UAE) reports one of the highest prevalence of diabetes. High prevalence of Type 2 Diabetes Mellitus in UAE, if diagnosed earlier or in stage of prediabetes can minimize the problem.

**Aim:** This study aimed to provide population-based estimates of prediabetes and undiagnosed type 2 diabetes prevalence in UAE.

**Methods:** A cross-sectional study was conducted to estimate prevalence of un-diagnosed diabetes prediabetes and total diabetes in a random sample of 506 adults aged 23 to 65 years of age. The prevalence of diabetes was defined using a previous diagnosis of diabetes or, if diabetes was not previously diagnosed, by (1) a hemoglobin A1c level of 6.5% or greater or a fasting plasma glucose (FPG) level of 126 mg/dL or greater. Prediabetes was defined as a hemoglobin A1c level of 5.7% to 6.4%, an FPG level of 100 mg/dL to 125 mg/dL.

**Result:** According to FPG levels, the prevalence of undiagnosed type 2 diabetes in Emirati adults was 10.8% (95% CI 8.52-13.50). Compared with FPG levels, the undiagnosed prevalence was greater using HbA1c level as a criterion, 12.56% (95% CI 10.14-15.45). The prevalence of prediabetes was 21.35% (95% CI 18.26-24.82) using FPG levels. The prevalence of prediabetes was higher, 37.19% (95% CI 33.89-41.63) using the HbA1c-only criterion. The overall prevalence of type 2 diabetes (FPG or HbA1c) was 19.17% (95% CI 16.1-22.4). The overall prevalence of type 2 diabetes was 23.36% (95% CI 18.55-28.54) in males and 15.71% (95% CI 11.92-19.82) in females. The prevalence of un-diagnosed diabetes was 30.77% (95% CI 20.55-43.29) using FPG levels and 28.95% (95% CI 19.70-40.35) using HbA1c levels.

**Conclusion:** This population-based study identified a significant proportion of people with prediabetes and un-diagnosed type 2 diabetes. The prevalence of prediabetes was higher using HbA1c levels as compared with FPG levels. Population based prevention strategy to address this problem is highly needed.

Result of a Patient Outreach Program to Assess the Reasons for not Following Up at a Diabetes Clinic

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**Keywords:** diabetes mellitus, patient care, patient compliance, program evaluation, pilot project

**Introduction and Background:** We present here the results of a diabetes helpline pilot program initiated by the department of Endocrinology and Diabetes at Al Zahra hospital, Sharjah, under guidance from the hospital management to investigate the reasons for patients who has failed to attend diabetes clinic in the previous six months.

**Methods:** We conducted this pilot study at Al Zahra hospital, Sharjah, over a period of 45 days from 15-9-2019 to 30-10-2019. Data of patients who had missed clinic appointment or had not followed up in the diabetes clinic in the previous 6 months were collected by the medical records and provided to the diabetes educator. The diabetes educator then contacted the patients through phone. A questionnaire was used to collect data from the patients regarding the reasons for missing clinic appointment and other variables. Patient awareness data including diagnosis and duration of diabetes, importance of HbA1c, knowledge of last HbA1c, presence of any hypoglycaemic episodes, compliance with medication and home glucose monitoring were collected in addition to reason for non-compliance with follow up clinic visits.

**Results:** 100 patients were contacted and data was collected. Of these 91 had type 2 Diabetes, 7 had type 1 Diabetes and 2 had pre diabetes. The various reasons provided by the patient for not being able to follow up with the clinic were retirement, too busy at work to attend to the doctor appointments, job change, switch to herbal medication, move to another emirate, left the country etc. Some patient forgot their appointments. Other reasons provided included insurance expiry, higher insurance co-payment, downgrade of insurance category and not covered at Al Zahra any more, not satisfied with management plan or following up with another department. Based on sample size of 100 patients: 25% of the patients have moved out of the hospital. This included patients who left the country, shifted to other emirates or to other hospitals. 7% of the patients were unsatisfied with either the waiting time or with treatment plan. Appropriate feedback is provided to the clinical department and appointment desks to address barriers in this area. 17% of patients have moved out because their insurance is not accepted in the current hospital. Feedbacks to relevant departments are made to find solutions for continued care of these patients as well. 25% of the patients have liked the process of the call being made as remainder for the appointments, and confirmed that they will come for follow up. This proves the usefulness of the diabetes helpline and encouragement to take this project further.

**Conclusion:** It was noted that a significant proportion of patients who were called were happy about the diabetes help line and appreciated the call back to discuss their concerns regarding their care. Data collected in this manner would help to identify barriers and provide opportunity to the hospital and care team to
overcome those barriers. This will ensure effective continued care of patients with chronic conditions like diabetes based on the principles of patient-centred care as advised by ADA and EASD.

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Sagittal Abdominal Diameter (SAD): A Marker of Metabolic Syndrome, Insulin Resistance (HOMA-IR) among Saudi Type 2 Diabetes Mellitus (T2DM) Patients

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Keywords: Insulin resistance, Metabolic syndrome, Sagittal Abdominal Diameter

Introduction and Background: Abdominal obesity has been identified as an important risk factor for T2DM. Anthropometric measures (BMI, waist circumference (WC) and hip circumference (HC) are commonly used in evaluating obesity. One major shortcoming of these measure are their inability to distinguish between abdominal and visceral adipose tissue. SAD (i.e., the height of the abdomen when lying supine) Can predict the amount of visceral fat and several studies showed its strong correlation with insulin resistance, hyperinsulinemia as well as its prediction of metabolic syndrome.

Aim: The study is aimed to evaluate SAD as predictor of metabolic syndrome components and (HOMA-IR) among Saudi T2DM patients.

Methods: A cross-sectional sample of 743 T2DM subjects (430 female and 313 male) collected for T2DM patients who meets the Inclusion and exclusion criteria, those patients who follow up in Chronic illness Center at Prince Sultan Military Medical City between November 2018 and April 2019.

Results: A total of 743 T2DM patients with a mean age of 57±12 (18-96) years was suitable for analysis. Mean SAD, BMI, WC and HC were 15.2±±3.8 cm, 33.05±±6.66, 105.6±±12.3 cm and 114.1±±13.1 cm respectively; mean HbA1c and C-peptide were 8.37%±±1.55 and 802.4±±464, 5pmol/L respectively. SAD (Sensitivity, specificity) with correspondence to metabolic syndrome were (69%, 77%) in males and (87%, 73%) in females. The area below the ROC curve was 14.70 cm for males and 15.25 cm for females. In Females and male, Each 1 cm increase in SAD increased 19% and 13% respectively of HOMA-IR threshold as well as SAD prediction of metabolic syndrome should be further examined.

Conclusion: SAD was a strong predictor of insulin resistance for both male and female among Saudi T2DM patients. The lower cut-off points of SAD in both genders compared with International threshold as well as SAD prediction of metabolic syndrome should be further examined.

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Study of Adults’ Glycemia in T1D (SAGE)

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Keywords: insulin therapy

Introduction and Background: The Global TEENs and US-based T1D Exchange registries demonstrated that the majority of people with type 1 diabetes (T1D) do not achieve HbA1c targets. SAGE examined diabetes control in adults outside of the US with T1D, across the following global regions: Asia, Eastern Europe [EE], Western Europe [WE], Latin America [LA] and Middle East [ME].

Methods: SAGE was a multinational, cross-sectional study of participants aged ≥26 years with T1D for ≥1 year. Data were collected at a single study visit for each patient, from medical records and interviews. This analysis evaluates the percentage of participants achieving HbA1c <7 % (<53 mmol/mol), and assessed other glycaemic and hypoglycaemic outcomes and therapeutic management of T1D.

Results: The number of eligible participants ranged from 1150 in WE to 444 in ME (Table). Cross-sectional HbA1c ≤7 % achievement was highest in WE (27%) and lowest in ME (19%). Incidence of documented symptomatic hypoglycaemia (≤3.9 mmol/L) within the last 3 months was lowest in Asia (59%) and ME (37%). Severe hypoglycaemia incidence was lowest in Asia (9%). Rates of diabetic ketoacidosis due to severe hyperglycaemia within the last 6 months appeared similar to those reported in published literature, with the highest rate in WE (7%) where use of insulin pumps was greatest (43%). Overall, physician-driven (rather than patient-driven) titration of any insulin was very common in Asia (56%), LA (53%) and ME (73%), but less so in EE (29%) and WE (31%). Regarding basal insulin (BI) type, NPH insulin was used most frequently in EE (22%) and LA (15%). First generation long-acting BI analogues were used more frequently in ME (69%), while most of the patients in Asia (43%) used second-generation long-acting BI
analogs. BI dose adjustment often occurred more than once a week in EE and WE (29%), while over 50% of participants in LA titrated less than once a month.

**Discussion/Conclusion:** SAGE identified suboptimal overall glycaemic control across every region analysed. Eastern and Western Europe had greater achievement of HbA1c <7 % but also a higher incidence of symptomatic hypoglycaemia compared with other regions. The observed regional differences could be related to variations in treatment strategies, including type of BI and insulin pump usage, physician- vs patient-driven titration and titration frequency, but also ethnic, cultural and health care system-related factors.

**26 Systematic Review and Meta-Analysis of the Ongoing Clinical Trials Across the World Assessing the Efficacy of Teneligliptin in Type 2 Diabetes Across Varied Clinical Spectrum**

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**Keywords:** Teneligliptin, Efficacy, Meta Analysis

**Introduction and Background:** Teneligliptin, a novel DPP-4 inhibitor, exhibits a unique structure characterized by five consecutive rings, which produce a potent and long-lasting effect. It is administered at a dosage of 20 mg once daily, which can be increased up to 40 mg per day. Ever since the first marketing approval in Japan in 2012 and South Korea in 2014, several studies have evaluated in various co-morbid scenarios. It is important to critically evaluate the contemporary study designs and parameters in the ongoing clinical trials across the world.

We aimed to systematically evaluate the study designs and the outcomes being analysed in the ongoing trials evaluating the efficacy of Teneligliptin in Type 2 Diabetes (T2DM) across varied spectrum including the parameters beyond HbA1c.

**Methods:** We reviewed the contemporary protocols of the trials that are currently ongoing through the WHO- ICTRP (www.who.int/ictrp/search/en), www.clinicaltrials.gov trials registry database. The latest evaluation was on January 5, 2020 with key word ‘teneligliptin’, for the trials initiated over last five years (2014-2019). Two researchers independently extracted the outcomes analysed, the number of patients included, duration of the studies and the treatment effect estimated SPSS was used for statistical analysis.

**Results:** We evaluated the database to study the clinical parameters being evaluated to improve HbA1c in association with other metabolic and non- metabolic parameters. Six trials (including, TOLEVEL) are cumulatively recruiting 1166 patients; with trials being conducted predominantly in Japan (5) and South Korea (1). Registration date of these trials range from January 2014 till October 2019. Five studies are open label and one study is double blind that would be independently assessed by outcome assessor. The study designs include randomised, parallel designed studies. The highest number of patients are being recruited in the TOLEVEL trial (n=936) evaluating the effect on Left Ventricular Diastolic Dysfunction. Teneligliptin is actively compared with other DPP IV inhibitors (sitagliptin, vildagliptin, alogliptin, linagliptin, teneligliptin, anaglaptin, saxagliptin) and SGLT 2 inhibitor (canagliflozin), with four trials are multi- comparative arms and two trials as single arm teneligliptin alone. The mean number of participants being enrolled is 194 (SD ± 363, maximum 936, minimum 40, range 896, 95% CI -187 to 576). The cumulative duration is 37 months, with mean duration 6.2 months (SD ± 8.9, minimum 1, maximum 24, range 23, 95% CI -3.2 to 16). The trials evaluate the glycomic control (HbA1c), serum BNP levels, cardiac function evaluated by echocardiography, serum insulin, serum SDF-1 alpha, serum active GLP-1, serum active GIP, endothelial function, Mixed meal tolerance test (MMTT), Mean amplitude of glucose excursion (MAGE), Diabetes Treatment Satisfaction (DTSQ), glycoalbumin, urine albumin creatinine ratio, cGFR, glucagon, urinary sodium excretion.

**Discussion:** This is the first ever systematic review evaluating for emerging outcomes based on the quantitative and qualitative parameters including clinical, biochemical and biomarker, based evaluation for both glycemic and non-glycemic outcome-based changes with teneligliptin.

**Conclusion:** Teneligliptin is being well researched for the emerging parameters across varied clinical spectrum of the patients.

**27 Three Years Cohort Follow Up via Population Based Intervention on Adolescent and Childhood Obesity and Overweight at Schools Setting**

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**Keywords:** Obesity, intervention, population based, school setting

**Background:** Obesity and overweight are recognized as major global public health phenomena. Its long term consequences are many of wide variety of chronic conditions including high blood pressure, type 2 diabetes, stroke, cardiovascular disease, and certain forms of cancer; which in turn are primary drivers of healthcare spending, disability, and deaths, childhood obesity is complex and multidimensional, which has been identified as a public health priority. It is also recognized that obesity decreases the quality of life and life expectancy considerably.

**Objectives:** To assess population based childhood obesity intervention over three year at school population in Dubai, To examine the childhood obesity intervention outcome.

**Methodology:** About 2600000 students age range (5-18) years grade (1 –12) over about 180 private schools in Dubai over three consequence academic years 2014-2015,2015-2016 and 2016-2017, BMI measurement as per CDC criteria and chart, WHO (mean + - SD) centile Body weight at the beginning of each academic year (September), wide variety of interventions been designed an applied e.g. health promotion, school Nutritional education activities, Food labelling, happy schools initiatives, 10/10
Blood glucose monitoring is done serially (SMBG) using a glucometer, which is useful for PwO and HCPs. Further emphasis to treat obesity as promptly as any other chronic disease should be encouraged.

**Keywords:** Obesity, gaps, management

**Purpose:** In spite of being recognized as a chronic disease, obesity remains underdiagnosed and undertreated in the UAE. The ACTION-IO study (NCT03584919) aimed to identify the international perceptions, attitudes, behaviors, and barriers to effective obesity care in people with obesity (PwO) and healthcare professionals (HCPs). Here we present the data collected in the UAE.

**Relevance:** Obesity is a growing health concern in the UAE. Understanding the perceptions and attitudes of PwO and HCPs is important to assess the current gaps in obesity management. This would help devise and implement necessary interventions to tackle the growing burden of obesity in the future.

**Methods:** Two separate online surveys (offered in English and Arabic and approved by Dubai Healthcare City Authority-Regulation/ Research Ethics Review Committee) were conducted for PwO and HCPs. Analysis: De-identified data were summarized and analyzed using descriptive statistics using SPSS (IBM, version 23.0), Stata (StataCorp LLC, version IC 14.2), and Excel (Microsoft, version 2016).

**Results:** 750 PwO and 200 HCPs completed the survey in the UAE. Most PwO (82%) and HCPs (78%) agreed obesity is a chronic disease. Many PwO believed obesity had an extreme impact on overall health (88%) and were motivated to lose weight (49%). However, most HCPs (54%) believed patients have little motivation for weight management. While PwO (48%) considered an improvement in their appearance to be the main goal for weight loss, HCPs (83%) believed the main motivator to be general health concerns. There was a mean of 4 years between the time when PwO started struggling with excess weight or obesity and when they first discussed their weight with an HCP. Most PwO (84%) would like their HCP to initiate a conversation about weight and none of them were offended by such a conversation. However, most HCPs (69%) reported not discussing weight management if they feel the patient is not interested in losing weight. This may constitute a barrier for weight management conversations.

**Conclusions:** Our UAE dataset reveals that PwO are motivated and inclined to lose weight and would like their HCPs to discuss weight management with them. This provides an opportunity for HCPs in the region to proactively initiate such conversations without the fear of being interpreted as offensive. Also, PwO and HCPs education is warranted to highlight the need for early consultations, and clear and effective communication is required between PwO and HCPs. Further emphasis to treat obesity as promptly as any other chronic disease should be encouraged.

**Keywords:** Diabetes Mellitus, Continuous blood glucose monitoring (CGM), self-monitoring of blood glucose (SMBG), HbA1c, FreeStyle Libre

**Introduction and Background:** Blood glucose monitoring is vital in every diabetic patient’s management as it gives their physician an idea of the body’s response to the care plan that has been individually curated for them. Traditionally, blood glucose monitoring is done serially (SMBG) using a glucometer, which is useful
in measuring discrete glucose levels accurately. However, it mandates constant finger pricking, which is undesirable and tedious, often resulting in poor adherence and does not provide an idea of real-time variability in blood glucose levels during the course of the day. In view of this, newer approaches for blood glucose monitoring are being tested every day; one of which is continuous glucose monitoring (CGM). CGM determines blood glucose levels on a continuous basis and provides information about the direction, magnitude, duration and frequency of fluctuations in glucose levels, and in turn, helps direct the physician towards the cause of variability. Case studies have concluded that with flash glucose monitoring system, there is a remarkable improvement in patients with difficult-to-control diabetes and an increase in the proportion of patients achieving good glycemic control. In addition, it was noted that the time spent in hypoglycemia by type 1 diabetics was reduced, compared to self-monitoring by capillary strips. CGM supplies trend information that may help identify and prevent unwanted periods of hypoglycaemia and hyperglycaemia and enables healthcare providers to improve regulation of blood glucose levels by adjusting insulin dosage as required, thus improving HbA1c levels. One such example of a CGM system is the Freestyle Libre system. The FreeStyle Libre provides a new concept of glucose monitoring by producing much greater data than blood glucose testing whilst being more affordable than other continuous glucose monitors. Readings are obtained by scanning a small, round sensor which is applied to the skin with a handheld applicator and then lasts in place for 14 days. Within the 14 days of usage, the sensor can be scanned with the reader which sends data of glucose levels over the previous 8 hours to the Libre system’s reader.

Methods: Study design: A single-arm, single center study was conducted at the Dubai Diabetes Center in a retrospective format, with a sample size of 99 patients for a time frame of three months for each patient. Participants: All diabetic patients, irrespective of the type of Diabetes, who were registered under Dubai Diabetes Center as users of the Freestyle Libre system from May 2016 through January 2017. Inclusion criteria: All UAE nationals, registered at Dubai Diabetes Center confirming to have: Established diagnosis of Diabetes Mellitus. Used the FreeStyle Libre Flash glucose monitoring system at least once. Used within a pre-set time frame of three months. Exclusion criteria: Patients who started using the system after the 30th of November 2016 (3-month period ending February 28, 2017). Patients who did not have their blood glucose recorded for at least 50% of the days (during the 14-day period of wear). Patients who were registered users of the system according to the database, but no Libre readings were available. The electronic medical records system (VPDMS) was used to obtain the clinical data of the patients. Statistical Analysis: Data were collected retrospectively for 99 patients who ranged from 4-81 years. The sample included a similar number of men and women (48% vs 52%) with more patients having Type 1 Diabetes than Type 2 Diabetes (58% vs 38%). It was noted that the HbA1c value for the majority of patients (65.7%) was above the target when using conventional blood glucose monitoring methods. HbA1c levels were measured before and after using the Freestyle Libre system. Paired t-test method was used for statistical analysis.

Results: There was noted to be a significant decrease in HbA1c from 8.44% to 8.03% (p = 0.008) after the introduction of continuous blood glucose monitoring using the Freestyle Libre system.

Discussion: The improvement in blood glucose control and the fall in HbA1C demonstrated in patients using the FreeStyle Libre system could be attributed to active patient participation in their plan of management by independent and easy monitoring of blood sugar levels. Real time information on blood glucose levels allows for timely intervention and enhanced control. Greater adherence to monitoring of blood sugar helps patients adjust their insulin doses according to blood glucose variability, while improving outcomes of blood sugar control and increasing the time period during which they are in the target blood sugar range. Our study was limited by sample size, as the CGM device was new to the United Arab Emirates and only a limited number of patients were available for data collection. In addition, some patients were non-compliant and did not scan daily, leading to suboptimal data. Furthermore, there was no control arm to the study, which could have helped perform a comparative study. Lastly, glucose variability before and after Libre use could not be compared, due to lack of antecedent data. Continuous glucose monitoring is a novel concept, which is believed to revolutionize the care of diabetic patients that only time and future research can prove or disprove. The scope for development and expansion of our study lies in including and assessing more variables to help understand the holistic impact of CGM on the patient’s health, especially in relation to hypoglycemic episodes faced by diabetic patients. The inclusion of a control group who will use the conventional method of blood glucose analysis such as the standard meter, will provide a standard against which the results can be compared. Furthermore, the addition of a qualitative dimension to the study, by assessing the improvement in the quality of life for patients who are benefitting by this no-prick technology, would be of great significance. The ease of use, inclination to be compliant and difficulties faced (if any) are some of the points that would offer an interesting insight into use of continuous blood glucose monitoring.

Conclusion: The use of continuous blood glucose monitoring using the Freestyle Libre system in diabetic patients was associated with a statistically significant improvement in HbA1c values over the period of 3-6 months. With patients facing many challenges with conventional blood glucose monitoring methods, and traditional methods have witnessed patients being receivers rather than participants in treatment, this device could be a breakthrough in allowing for easier and continuous measurements. Continuous glucose monitoring systems provide additional benefit as it gives information on the variability of blood glucose levels during the day, all of which will guide healthcare providers in making more effective therapeutic decisions ultimately resulting in long term improvement of their patient’s glycemic control.
Weekly Semaglutide vs Liraglutide Efficacy Profile: A Systematic Review and Network Meta-Analysis

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Keywords: Network meta-analysis, diabetes mellitus, glycemic control, HbA1c, weight, semaglutide, liraglutide, Glucagon-like peptide, GLP-1, and GLP-1 RA

Introduction: Glucagon-like peptide 1 receptor agonist (GLP-1 RA) is a class of hypoglycemic medication that has shown benefit in glucose metabolism, beta-cell function enhancement, and weight loss promotion with low risk of hypoglycemia. The U.S. FDA has approved several GLP-1 RAs, including liraglutide once-daily (OD), and semaglutide once-weekly (QW) in 2010 and 2017, respectively. Both medications significantly improved glycemic control in comparison to placebo. To date, no phase III head-to-head comparisons between semaglutide QW and liraglutide OD are available. This network meta-analysis (NMA) aims to compare the long-term efficacy of semaglutide versus liraglutide.

Methods: PubMed, Embase, and Cochrane library were searched from inception till June 2019 to acquire relevant articles. Nine long-term randomized controlled trials comparing once-weekly semaglutide or liraglutide with placebo or other active comparison were identified. Outcomes of interest were changes in HbA1c and weight after 52 weeks. A Bayesian framework and NMA was used for data synthesis. This is a sub-study of the protocol registered in PROSPERO, number CRD42018091598.

Results: Nine trials were included in the analysis. The data showed significant superiority in HbA1c reduction of semaglutide 1 mg QW over liraglutide 0.6 mg, 1.2 mg, and 1.8 mg with a treatment difference of 0.56, 0.47, and 0.3, respectively. Semaglutide 0.5 mg QW was not found to be superior to liraglutide in HbA1c reduction. Regarding weight reduction analysis, semaglutide 1 mg QW was significantly associated with a greater reduction than liraglutide 0.6 mg with a treatment difference of 3.06. However, semaglutide 0.5 mg QW showed no superiority to liraglutide in weight reduction. SUCRA score suggested the superiority of semaglutide 1 mg QW in HbA1c and weight reduction after one year of treatment.

Conclusion: This NMA illustrated that semaglutide could improve the control of blood glucose and body weight. The capacity of long-term glycemic control and body weight control of semaglutide appears to be more effective than other GLP-1 RA, including liraglutide. However, considering the number of included studies and potential limitations, more large-scale, head-to-head, well-designed RCTs are needed to prove these findings.