Article published online: 2022-07-28

Free Communications of The Gulf Association of Endocrinology and Diabetes Virtual Meeting 2021 - October 7–9, 2021

Guest Editors

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ABSTRACT

These are the advance abstracts of the Clinical Congress (Virtual) of the Gulf Association of Endocrinology and Diabetes held on October 7–9, 2021. The declared educational objectives of the congress were to give a "state of the art in endocrine practice." Plenary and symposia presentations were delivered online by international and regional key opinion leaders. In addition, free communications on current research and clinical practice in the region and worldwide were presented online. We present here the abstracts of the congress as submitted by the authors of the free communications after minimal restyling and editing to suit the publication requirements of the Journal. We hope that by publishing them in our open access journal, we provide an early recognition of the work and extend the benefit to those who could not make it to the live presentations.

Keywords: Adrenal, diabetes, education, hypoglycemia, pituitary, reproductive, research, thyroid

Introduction

The COVID-19 pandemic-related worldwide restrictions imposed major limitations on the conduct of medical practice, education, and research worldwide.[1] The present meeting is the First Annual Congress of The Gulf Association of Endocrinology and Diabetes (GAED) since its inception.[2] It had to be converted to virtual format. The meeting was held between the south and October 9, 2021. The Annual Congress aimed to maintain the standards of its predecessors (Gulf Chapter of the American Association of Clinical Endocrinologist), which was formed by essentially the same gathering of endocrinologists in the Arabian Gulf (2012–2020).[3-10] The declared educational objectives of the congress are to give a "state of the art in endocrine practice." It caters primarily for the professional development needs of endocrinologists and internal medicine, with special interest in diabetes and endocrinology. However, in the past, many primary care physicians, doctors in training, and specialist nurses and educators found many aspects of the contents, particularly relevant to their continuous professional development needs.

The conference highlights the latest in research and clinical practice in presentations delivered by international and regional key opinion leaders. Furthermore, free communications on current research and clinical practice in the region and worldwide attract great interest. The GAED sees this as a core role in its mission to improve care by education and research since gaps in both attitudes and practices have been identified in our region.[11] The abstracts of the free communications as submitted by the authors after minimal restyling and editing to suit the publication requirements of the Journal. We hope that by publishing them in our open access journal, we provide an early recognition of the work, stimulate networking between parties of mutual research interests, and also extend the benefit to those who could not make it to the live presentations.

Access this article online

Quick Response Code:

Website: www.jdeponline.com

DOI: 10.4103/jdep.jdep_41_21

ORAL COMMUNICATIONS

OC1. Prevalence and Predictors of Hypogonadism Recovery in Men with Macroprolactinomas Treated with Dopamine Agonist

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How to cite this article: Free communications of the gulf association of endocrinology and diabetes virtual meeting 2021 - October 7–9, 2021. J Diabetes Endocr Pract 2021;4:210-31.

Received: 25-08-21 **Accepted:** 26-11-21 **Web Published:** 30-12-21

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Background: Hypogonadism is the most common form of hypopituitarism in men with macroprolactinoma, but factors related to hypogonadism recovery are limited. **Objectives:** We aimed to study the prevalence of hypogonadism in men with macroprolactinoma exclusively treated with dopamine agonists and assess factors predicting hypogonadism recovery. **Methods:** A multicenter retrospective study of men with macroprolactinoma identified using ICD 9 and 10 codes and treated between 2009 and 2019 in five centers in the United Arab Emirates and the Kingdom of Saudi Arabia. Hypogonadism defined as low testosterone level with normal or low gonadotropins being evaluated at presentation and at the last clinic visit. **Results:** A total of 101 patients (mean age 33 years) were initially included in the study. The most common symptoms at presentation were headache (75.3%), erectile dysfunction, low, and libido. Median tumor size at diagnosis was 2.7 cm. Of 82 patients with available data, 62 (75.6%) had evidence of hypogonadism at baseline. The prevalence of growth hormone deficiency and hypothyroidism was 35.9% and 32.5%, respectively. The median (interquartile range [IQR]) serum prolactin level (PRL), available in 83 patients, was 20,000 (56,293.6) miU/l, with a median serum total testosterone (TT) level of 4.4 (5.3) nmol/l. Most patients were treated with cabergoline (n =, %), with a median (IQR) duration of 6 (4) years. Follow-up data on hypogonadism status were available on 60 out of 62 patients. Of those, 39 patients (65%) recovered their pituitary–gonadal axis. Patients with recovered hypogonadism had smaller tumor size (2.4 [1.5] vs. 4.3 [3.3], $P = 0.003$), lower PRL level (18,277.0 [28,967.0] vs. 63,702.5 [139,344.5], $P = 0.008$), higher TT level (4.6 [4.9] vs. 2.3 [2.7], $P = 0.007$), lower PRL normalization time on medical therapy (8 months (0.7–72) vs. 24 (3–120), $P = 0.009$), and lower frequency of GHD (40% vs. 60%, $P = 0.006$) and hypothyroidism (36.8% vs. 63.2%, $P = 0.003$) compared with those with persistent hypogonadism, respectively. Age at diagnosis, presenting symptoms, baseline gonadotropin levels, and duration of medical therapy and did not predict recovery of hypogonadism. **Conclusions:** About two-thirds of men with macroprolactinoma recover from hypogonadism mostly with 12 months of therapy. Smaller adenoma size, lower PRL, earlier prolactin normalization, and higher testosterone patients were related to testosterone normalization.

OC2. Risk Factors Associated with Progression of Diabetic Neuropathy

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Objective: There are limited longitudinal studies assessing the risk factors associated with the evolution of diabetic peripheral neuropathy (DPN). M**ethods:** Patients with type 2 diabetes (T2D) (n = 78) and control participants (n = 26) underwent clinical, metabolic, and neuropathy phenotyping using corneal confocal microscopy (CCM), vibration perception threshold (VPT), and DN4 questionnaire at baseline and 2-year follow-up. **Results:** The prevalence of DPN and painful DPN was 18% and 26%, respectively. Patients with T2D had a higher VPT ($P \leq 0.01$) and lower corneal nerve fiber density (CNFD), corneal nerve branch density (CNBD), and corneal nerve fiber length (CNFL) ($P \leq 0.0001$) compared to controls. Over a 2-year follow-up period, there was a significant decrease in HbA1c ($P \leq 0.001$), body weight ($P \leq 0.05$), and LDL ($P \leq 0.05$). There was no change in the prevalence of DPN ($P = 0.28$), but there was a significant improvement in DN4 in patients who had painful neuropathy at baseline ($P \leq 0.0001$). VPT ($P = 0.57$) and CNFD ($P = 0.28$) did not change, but there was a decrease in CNBD and CNFL ($P \leq 0.05$). However, there was a significant decrease in CNFD ($P < 0.01$), CNBD ($P < 0.001$), and CNFL ($P \leq 0.001$) in patients who were physically inactive, while there was an increase in CNFD ($P \leq 0.01$) and CNFL ($P < 0.05$) in patients who were physically active. **Conclusions:** Despite a modest improvement in HbA1c, body weight, and LDL in patients with T2D, there is evidence of progressive small nerve fiber degeneration associated with physical inactivity, while regular physical activity was associated with small nerve fiber regeneration.

OC3. Prevalence and Risk Factors for Diabetic Peripheral Neuropathy, Neuropathic Pain, and Foot Ulceration in the Arabian Gulf Region

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Objectives: This study determined the prevalence and risk factors for diabetic peripheral neuropathy (DPN), painful DPN, and diabetic foot ulceration (DFU) in patients with type 2 diabetes (T2D) in secondary healthcare (SHC) in Qatar, Kuwait, and the Kingdom of Saudi Arabia. **Methods:** Adults aged 18–85 years with T2D were randomly enrolled from SHC and underwent clinical, metabolic, and DPN using vibration perception threshold and DN4 questionnaire, as well as DFU assessments. **Results:** A total of 3021 subjects were recruited between June 2017 and May 2019. The prevalence of

DPN was 33.3% of whom 52.2% were at risk of DFU and 53.6% were undiagnosed. The prevalence of painful DPN was 43.3%, of whom 54.3% were undiagnosed. DFU was present in 2.9%. The adjusted odds ratios (AORs) for DPN and painful DPN were higher with increasing diabetes duration, obesity, poor glycemic control, and hyperlipidemia and lower with greater physical activity. The AOR for DFU was higher with the presence of DPN, severe loss of vibration perception, hypertension, and Vitamin D deficiency. **Conclusions:** This is the largest study to date from the Middle East showing a high prevalence of undiagnosed DPN, painful DPN, and those at risk of DFU in patients with T2D and identifying key risk factors.

OC4. Toxic Multinodular Goiter: Epidemiological, Clinical, Biochemical, and Radiological Features

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Background: Toxic multinodular goiter (TMG) is one of the important causes for retrogradation of patients' health. For this reason, the purpose of this study is to identify the incidence of TMG in patients admitted to Sultan Qaboos University Hospital (SQUH) and to describe epidemiological, clinical, biochemical, and radiological characteristics for TMG patients. **Methods:** A retrospective study was conducted among Omani patients, and the collected data were searched for all patients who had abnormal thyroid function test and admitted to thyroid clinic at SQUH; it included patients aged above 20 years with abnormal thyroid scan or patients with goiter or symptoms of hyperthyroidism at the time of clinical presentation. However, we excluded pregnant women, thyroid cancer patients, and those who present with hypothyroidism. **Results:** A total of 66 patients were included based on the diagnosis of TMG on biochemical, thyroid ultrasound scan, and thyroid uptake scan for 930 patients demonstrated in SQUH at specified duration. We discovered that the incidence rate of TMG was 71 new cases per 1000 people who had thyroid uptake scan. The male to female ratio was 1:12, with mean and median age 50 (standard deviation ±14.3); the disease was founded in females with 92.4% of total patients. The most reported symptom was palpitations, and the most signs were goiter and tenderness. The presence of thyroid nodules was found in 97% of patients with TMG. In thyroid scintigraphy, 50% of a total of 66 patients were found to have normal Tc-99 uptake. Thyroid hormone test showed that the majority of patients (51.5%) appeared with normal levels of FT4 and 68.2% had suppressed in their TSH level. In pathological findings, 79.5% of 39 patients who had FNA were found to be benign with Bethesda II classifications. The management offer to our patients was carbimazole with (47%), radioactive iodine treatment was given to 13.6% of patients, and surgery was preceded in 15.2% of patients. **Conclusions:** TMG is a common thyroid disorder in our environment, presenting with hyperthyroidism and neck swelling. Our study showed that TMG is more common in females compared to males with palpitation as the most common clinical presentation followed by multiple nodules. The treatment offered to our patients was carbimazole as the first line, while radiotherapy was the most common permanent cure. Surgery was performed in patients with huge neck swelling and obstructive symptoms.

OC5. The Thyroid One-Stop Clinic for Newly Referred Patients with Thyroid Nodules

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Background: Thyroid one-stop clinic (TOSC) is an emerging new approach in providing an integrative diagnostic and therapeutic care for thyroid nodule patients, which has been shown to save cost and time compared to conventional approach. The aim of this study is to measure the effectiveness of this approach in terms of time and cost reduction compared to the conventional way that usually takes five visits, in addition to the safety of this new approach. **Methods:** This was a prospective case–control study that involved a comparison between the patient journey of newly referred patients with thyroid nodules who attended the new established TOSC, compared to those who attended the usual conventional clinic at King Fahad Medical City, Riyadh, between 2017 and 2020. In TOSC clinic, ultrasound-guided FNA and cytology are done at one session by experienced thyroidologist and pathologist, respectively, compared to usual care which involves multiple visits. The primary outcomes include the total amount of time taken from the first visit to the final diagnosis and the cost spent by the patients. The secondary outcomes were biopsy disclosure time (the time from the FNAC to the clinical decision) and patient satisfaction rate. Statistical analysis was done using SPSS software, and independent Student's *t*-test was used for continuous variables while χ^2 test was used for categorical variables comparisons. Statistical significance was set at $P < 0.05$. **Results:** Sixty patients' data were prospectively collected from the conventional clinic group, 88.33% of whom were females with a mean age being 43.96 years, while 100 patients were recruited to TOSC, 87% of whom were females with a mean age of 42.12 years. The total time taken from first visit to the final decision was 138 days in the conventional group versus 2.5 days in the TOSC, $P < 0.001$. The biopsy disclosure time was 20 days in the conventional group while was 2.51 days in the TOSC, $P < 0.001$. Moreover, the mean cost spent by the patients regardless of their place of residence was 4470.00 Saudi Riyals (S.R.) for conventional clinic groups compared to 475.00 S.R. in TOSC, $P < 0.001$. The difference in cost was even more remarkable for patents from Riyadh City versus those from outside Riyadh (450.00 vs. 19583.00 SR) for the conventional clinic, compared to 204 vs. 2218 SR) for TOSC, respectively. Furthermore, the satisfaction rate was 51.25% in the conventional group versus 100% in the TOSC group. There were no serious adverse events reported in either group. **Conclusions:** The TOSC proves the value of the multidisciplinary approach for the patient-centered care service, which requires qualified care providers as well as well-equipped clinics. Moreover, TOSC approach significantly shortens the journey taken by newly referred patients with thyroid nodules, is extremely cost-effective, and significantly improves overall patients experience and satisfaction.

POSTER PRESENTATIONS

P1. Less Likely with Empagliflozin, But It Happened

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Background: The sodium glucose co-transporter 2 (SGLT2) inhibitors are the newest class of oral hypoglycemic agents with a novel mechanism of action, which makes these medications an intriguing option for patients throughout the natural history of type 2 diabetes and as a possible adjunct therapy for type 1 diabetes with close supervision. The FDA Adverse Event Reporting System (FEARS) database identified 19 cases of urosepsis with SGLT2 inhibitors; four of them required intensive care unit (ICU) admissions but none with empagliflozin. This case illustrates the temporal association between the SGLT2 inhibitor (empagliflozin) and serious urinary tract infections (UTIs). **Case Report:** A 76-year-old male, long-standing type 2 diabetes mellitus (DM), well controlled on metformin. He has a history of hypertension, obesity, Dyslipidemia, coronary artery disease, and severe left ventricular (LV) dysfunction. With all of that in mind, he was started on empagliflozin. One month later, he was admitted to the ICU with life-threatening septic shock secondary to UTI requiring high doses of inotropic agents. Both blood and urine cultures grew ESBL-producing *Escherichia coli* that favorably responded to meropenem and he had no recurrence of UTIs for one year after discontinuing empagliflozin. **Conclusions:** SGLT2 inhibitors are not considered as initial therapy for the majority of type 2 diabetes patients. They are associated with modest improvement in glycemia, low risk of hypoglycemia, modest weight and blood pressure reductions, and favorable cardiovascular and renal outcomes but are costly and lack long-term safety data including that of prolonged glucosuria. In December 2015, the FDA warned that SGLT2 inhibitors may result in serious UTIs. The median time of onset was 45 days. Eight of the 19 reported cases had positive blood cultures (*E. coli*). Several studies looked into the relationship between dose and the UTI risk and concluded that there is no association except with dapagliflozin >10 mg OD. Furthermore, they found that empagliflozin was associated with lower risk than other SGLT2-inhibitors. **Conclusions:** This case illustrates the temporal association between the SGLT2 inhibitor (empagliflozin) and serious UTIs. For patients prescribed SGLT2 inhibitors who develop UTIs, clinicians should maintain a high index of suspicion so that appropriate therapy can be provided in a timely manner.

P2. Diabetic Emergencies among Patients with Diabetes Mellitus Who Participated in Hajj of 2019

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Background: Diabetic emergencies are diabetic ketoacidosis (DKA), hyperglycemic hyperosmolar state (HHS), and hypoglycemia. They are serious acute life-threatening complications of diabetes mellitus (DM). Thus, diabetic emergencies need rapid recognition, diagnosis, and treatment. Numerous studies had explored the prevalence and risk factors of diabetic emergencies (3). This study aimed to explore the frequency and associated factors of diabetic emergencies among pilgrims' patients with DM during Hajj, Mecca, 2019. **Methods:** This is a prospective study which is conducted on 153 patients with DM who were presented to one of the major healthcare-providing facilities during Hajj, which are "Arafat," "Muzdalifa," and "Mina" healthcare centers. The study was conducted from August 5th to 12th 2019. **Results:** More than 90% of the study participants were patients with type 2 diabetes mellitus (T2DM), while around 7% had type 1 diabetes mellitus (T1DM). DKA, HHS, and hypoglycemia were presented in 7.2%, 12.4%, and 18%, respectively, of the participants. Moreover, the study found that "younger age" and "type of medication" are significantly associated with DKA. Furthermore, "older age," "type of medication," "having cardiovascular disease," and "diabetes duration" were found to have a significant association with HHS. **Conclusions:** This study shed light on possible associated factors with diabetic emergencies among patients with DM who participated in Hajj 2019. As a primary prevention measure, further efforts are needed for health education about diabetic emergencies for pilgrims with DM who intend to do hajj, especially those who use insulin and had longstanding diabetes. Further research of DM and initiatives creating guidelines for health provider and patients with diabetes during pilgrims are important focuses for future.

P3. Frequency of Diabetic Ketoacidosis in Patients with Type 1 Diabetes Using FreeStyle Libre: A Retrospective Chart Review

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Background: Diabetic ketoacidosis (DKA) is an acute complication associated with poorly managed or undiagnosed diabetes. DKA is associated with significant morbidity, mortality, and healthcare costs but can be prevented with appropriate management of diabetes. The FreeStyle Libre is flash glucose monitoring device that measures glucose levels in the interstitial subcutaneous tissue and has been shown to reduce HbA1c and time in hypoglycemia and hyperglycemia, as well as improve health-related quality of life. **Methods:** A retrospective chart review of patients with type 1 diabetes mellitus (T1DM) and recurrent DKA and who initiated FreeStyle Libre (Abbott Diabetes Care, Alameda, CA, USA) was conducted. DKA frequency and severity, glycated hemoglobin (HbA1c), and frequency of blood glucose monitoring were compared during the 2-year period before FreeStyle Libre initiation and the 2-year period after FreeStyle Libre initiation. **Results:** A total of 47 patients with T1DM with recurrent DKA were included. FreeStyle Libre was associated with a reduction in the frequency of DKA events, with a mean of 0.2 (standard deviation [SD] 0.4) events per person during the 2 years after FreeStyle Libre initiation versus 2.9 (SD 0.9) during the 2 years before FreeStyle Libre initiation. Severity of DKA events was also reduced, with fewer severe (before mean 0.3 [SD 0.5] versus after 0.0 [SD 0.0]; $P < 0.001$) DKA events. A reduction in HbA1c (mean 7.4% [SD 0.5] after versus 9.9% [SD 1.2] before [$P < 0.001$]) and an increase in frequency of blood glucose testing (mean 8.1 scans/day [SD 1.7] after versus 2.2 finger-pricks/day [SD 0.7] at before [$P < 0.001$]) were also observed. **Conclusions:** FreeStyle Libre is associated with a reduction in the frequency and severity of DKA events, reduction in HbA1c, and increase in frequency of blood glucose testing in patients with T1DM and recurrent DKA. The use of such a glucose monitoring tool can help reduce the burden of morbidity, mortality, and healthcare costs associated with complications of diabetes.

P4. Effectiveness of the Flash Glucose Monitoring System on Diabetes-Self-Management Practices and Glycemic Parameters among Patients with Type 1 Diabetes Using Insulin Pump

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Background: The objective of the study is to determine the effectiveness of Freestyle Libre 2 (FSL2) on diabetes-self-management (DSM) practices and glycemic parameters among patients with type 1 diabetes (T1D) using an insulin pump. **Methods:** This prospective study was performed among 47 patients with T1D (13–21 years) who self-tested their glucose levels by the conventional finger-prick method using blood glucose meters (BGMs). Data related to glycemic profile, i.e., mean time in range (TIR), mean time above range (TAR), mean time below range (TBR), mean glucose level, hemoglobin A1c (HbA1c), total daily dose of insulin (TDDI), frequency of glucose monitoring, and DSM responses were collected at baseline and at 12 weeks. **Results:** The mean TIR was 59.8% ± 12.6%, TAR 32.7% ± 11.6%, TBR 7.5% ± 4.3%, mean glycemic variability, standard deviation 63.2 ± 12.5 mg/dL, and the coefficient of variation 41.3% ± 11.4% at 12 weeks. At baseline, the HbA1c level was 8.3%, and at 12 weeks, it dropped to 7.9%. Baseline glucose monitoring frequency through BGM was 2.4/day; however, after the patients employed the FSL2, a higher degree of frequency of glucose monitoring was evident at 12 weeks as 8.2/day. Significant improvements were observed in all the DSM subscales at 12 weeks. **Conclusions:** Using FSL2 was found to raise the patients' DSM levels and improved metabolic control.

P5. Effect of Virtual Education on Glycemic Control in Patients with Type 1 Diabetes during Fasting Ramadan

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Background: Managing patients with T1DM who fast Ramadan is challenging. The COVID-19–related strict imposed curfew in Saudi Arabia-affected access to healthcare and made virtual education (VD) a necessity. **Objective:** To assess the impact of VD on glycemic control and self-management in T1DM during Ramadan fasting. **Methods:** This is pre–post-Ramadan survey at endocrine clinics of National Guards Hospital, Jeddah, Saudi Arabia. Patients were contacted by phone due to COVID-19 restrictions. The VD methods (video + booklet) were sent to patients via WhatsApp. HbA1c was measured before and after Ramadan. **Results:** Eighty-nine patients enrolled: 51.2% males, DM duration 13.8 ± 7.7 years, age 24.4 ±8.1 years. >90% stated that VD used was well done/acceptable, and 57% confirmed using it as reference. During Ramadan, 88% complied with frequent SMBG, 72.6% reported breaking the fast at the recommended threshold of <70 mg/dl, but only 22.6% broke fasting if >300 mg/dL. 61% followed the recommended insulin adjustments to basal and suhoor doses, and to adjustment of meal timings (delay of suhoor), and fluid intake. 43% complied with eating protein at suhoor. Baseline HbA1c 8.46 ±1.85 and decreased to 8.32 ±1.47 after the intervention process (P = 0.004). **Conclusions:** Diabetes virtual education was well received and improved glycemic control and self-care among patients with T1DM during Ramadan fasting.

P6. Atorvastatin Attenuates Streptozotocin-Induced Diabetic Retinopathy in Rats

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Background: Diabetic retinopathy (DR) is a complex pathophysiological event and a major cause of blindness in diabetic patients. Hence, the current study was designed to study the effect of atorvastatin on induced DR in rats. **Methods:** The study was conducted on 40 rats divided into four equal groups. Group 1 served as normal control group. Diabetes mellitus (DM) was induced, by a single intraperitoneal injection of streptozotocin (60 mg/kg) in Group 2 (DR model group), Group 3 (insulin-treated group), and Group 4 (atorvastatin-treated group). Insulin and atorvastatin were administrated daily for 8 weeks starting 24 h after induction of DM. All rats were sacrificed at the end of the study, and the following parameters were assessed in each group: glycosylated hemoglobin (HbA1c%), serum malondialdehyde (MDA), retinal histopathological changes, retinal neuronal cell death, and immunohistochemical detection of both retinal vascular endothelial growth factor (VEGF) and intercellular adhesion molecule 1 (ICAM-1). **Results:** Induction of DM caused marked deterioration in all the measured parameters in the DR control group when compared to the normal control group. Administration of insulin or atorvastatin was associated with marked improvement in the measured parameters in the form of significant reduction of HbA1c%, serum MDA, retinal histopathological changes, retinal neuronal cell death, retinal VEGF, and retinal ICAM-1. **Conclusions:** Atorvastatin attenuates significantly streptozotocin-induced diabetic DR in rats due to its pleotropic effects on retina including anti-inflammatory and antioxidant effect.

P7. Screening Tests for the Diagnosis of Distal Symmetrical Polyneuropathy in Type 2 Diabetes Mellitus Results from a Cross Sectional Study in South Asian Patients

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Background: The World Health Organization (WHO) has estimated that the developing world would bear an increasingly larger burden of diabetes in the near future. South Asia, in particular, is considered one of the areas of highest increase in projected numbers. The most common presentation of diabetic neuropathy is distal symmetrical polyneuropathy (DSPN), which accounts for 50% of neuropathies associated with diabetes. In the present study, we aimed to evaluate

the effectiveness of two beside tests (VibraTip and Neuropad) as screening tests to diagnose DSPN in South Asian male patients with type 2 diabetes mellitus (T2DM). **Methods:** One hundred and twenty Pakistani patients diagnosed with T2DM were recruited. There were 60 male and 60 female patients who met the inclusion criteria. Each patient had glycemic control parameters, lipid profile, and renal function assessed. DSPN was defined by a Michigan Neuropathy Screening Instrument (MNSI) clinical score greater than 2. Patients were divided into two groups: subjects with clinical DSPN (MNSI >2) and subjects without DSPN (MNSI >2). All patients had both VibraTrip tests and Neuropad tests applied. Statistical analyses were conducted using the SPSS software (V.21) and data were presented as means ± standard deviation (SD). Student's *t*-test was used to compare the means of important variables in both groups and Chi-square test to compare proportions between groups. Measures of diagnostic performance (sensitivity, specificity, negative predictive value [NPV], and positive predictive values) were calculated. **Results:** The prevalence of DSPN determined clinically by MNSI was 35.8%. DSPN in these patients was associated with age, worsening renal function, and insulin treatment. The VibraTip test exhibited a sensitivity of 52.1% and specificity of 93.3%, with an NPV of 87.1%. The sensitivity and specificity of the Neuropad test for DSPN was 62.6% and 68% respectively. Its NPV was 84.6%. **Conclusions:** Both the Neuropad and VibraTip tools show considerable diagnostic power for DSPN in South Asians. However, further studies regarding the cost-effectiveness of these tools in clinical practice are needed.

P8. Knowledge and Practices of Insulin Pump among Adults with Type 1 Diabetes Attending a Specialized Center in Saudi Arabia

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Background: Successful insulin pump therapy is influenced by patients' adherence to self-care behaviors. Local data about the practices of patients using insulin pumps are limited. The objective was to examine insulin pump-related knowledge and practices among patients with type 1 diabetes (T1D). **Methods:** A survey study was conducted among adult patients with T1D receiving care at a specialized center in Saudi Arabia. Data were collected between January and March 2021 using a 56-item questionnaire covering 10 domains of insulin pump practices. **Results:** A total 71 patients were included. The average age was 27.6±7.9 years and 74.6% of the patients were females. The average duration of diabetes was 12.8±6.8 years. The overall score of knowledge and practices was 69.4%. The domain with the highest score was pump operations (81.3%), followed by pump failure and issues (73.2%), recording and follow-up (72.8%), temporary pump removal (71.5%), use of advanced pump features (70.6%), travel and going out (69.9%), management of acute complications (69.7%), pump maintenance (64.1%), exercises and stressful conditions (63.0%), and finally infusion site infection (24.7%). There were no associations between the level of knowledge and practices and the patients' age and gender. Approximately half (50.7%) of the patients expressed their need for counseling to improve their skills in using an insulin pump. **Conclusions:** The current findings point to the domains that need further education and training, especially guarding against infusion site infection and exercise-induced hypoglycemia. The findings justify conducting a larger study to examine the impact of customized reeducation intervention.

P9. Prevalence and Predictors of Using Complementary and Alternative Medicine among Diabetic Patients in Taif City, Saudi Arabia

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Background: Saudi Arabia has the second-highest rate of diabetes in the Middle East. Herbal treatment is the most used complementary and alternative therapy among Saudi diabetic patients. Little is known about the use of complementary and alternative medicine among diabetic patients who reside in Taif city. **Methods:** We evaluated the magnitude and correlates of complementary and alternative medicine (CAM) use among diabetic patients attending diabetic clinics and primary healthcare in two governmental hospitals, namely Prince Mansour Military Hospital and National Gourd Hospital in Taif city. **Results:** CAM prevalence was 33.7%, of whom 87.3% did not consult a doctor before use and 43.2% had more than one source of information, while 62.7% used more than one CAM method. Around 49.2% reported that it is very useful, and 72.9% did not notice any side effects from its use. In addition, 47.5% would recommend CAM to other diabetic patients. All (100%) reported using bitter apple, 66.1% reported using cinnamon, 55.1% used ginger, 35.6% took fenugreek, and 21.2% reported using garlic as an only CAM. Female gender, family history, diabetic complications, and longer duration of diabetes were associated with the increased use of CAM. **Conclusions:** CAM use by diabetic patients in Taif is prevalent. Health education and the safe use of CAM are much needed. Appropriate efforts from the government to integrate CAM into conventional diabetes treatment should be considered.

P10. Prevalence of Macrovascular Complications and Vascular Risk Level in Diabetics

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Background: Nearly one in two people with diabetes dies of ischemic heart disease, and the risk of developing cardiovascular disease is doubled in the presence of diabetes. Our study estimates the prevalence of macrovascular complications and vascular risk factors reported by people with diabetes. **Methods:** This is a descriptive, cross-sectional epidemiological study, which involved a representative sample of diabetic patients aged 18 years and over, residing in an urban commune of Algiers. Data analysis was performed using Epi Info 6.04 software. **Results:** This survey involved a representative sample of 268 diabetic patients. More than 17.2% of diabetics reported at least one macrovascular complication (angina, myocardial infarction, coronary revascularization, or

stroke). The prevalence of ischemic complications increased with age and duration of diabetes. At the onset of diabetes (less than 5 years), 17.6% of people with diabetes already reported at least one ischemic complication. Among the diabetics surveyed: 98.1% had at least one other vascular risk factor (hypertension, dyslipidemia, smoking, overweight, or obesity), 74.2% at least two and 28.3% at least three. Dyslipidemia, hypertension, and obesity were found in 43.8%, 69.1%, and 49%, respectively. More than a quarter (28.3%) had an HbA1c level <7%, but 12.3% had a level above 8%, thus a high risk of complications. Almost two-thirds (61.2%) of people with diabetes were receiving cardiovascular medication. **Conclusions:** These results suggest poor management of diabetics, as one in five had at least one macrovascular complication and more than 98% had at least one vascular risk factor. It appears essential and feasible in view of the clinical trials to strengthen secondary and tertiary prevention of diabetes by combating their vascular risk.

P11. Prevalence and Risk Factors for Urinary Incontinence Among Women with Diabetes in Taif City, Saudi Arabia

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Background: Urinary incontinence (UI) is a detected complication of diabetes mellitus. Studies about UI among diabetic women in Saudi Arabia are limited. The aim of this study was to assess the prevalence of UI in women with diabetes in Taif city, Saudi Arabia, and to determine its risk factors. **Methods:** A cross-sectional study was done on 398 diabetic women who attended the diabetes clinic at Prince Mansour Military Hospital, Taif city, Saudi Arabia. A checklist was used gathering data about sociodemographic characteristics, type and duration of diabetes, chronic diseases, parity, body mass index, presence of neuropathy, retinopathy and nephropathy, level of HbA1c and fasting blood glucose (FBG). **Results:** The prevalence of UI was 34%. In the last 4 weeks, 48.9%, 25.9%, 6.7%, 12.6%, and 34.1% of studied women had frequent urination, urine leakage drops, difficulty in urinating or emptying, pain or discomfort in lower abdomen, leakage related to urgency, and leakage related to physical activity, respectively. Among them, 11.1%, 11.9%, 12.6%. 19.3%, 15.6%, 19.3%, and 20.7% suffered effects of UI on the ability to do household chores, physical recreation, entertaining activities, ability to travel in car or bus more than 30 min, participation in social activities outside, emotional health, and feeling frustrated, respectively. Participants with an age more than or equal to 50 years, and having diabetes mellitus type 2, UTI, ovarian cyst, and neuropathy higher levels of HbA1 and FBG, had a significantly higher percentage of those having UI. Participants' older age and high HbA1c level were independent predictors for UI. **Conclusions:** There is a need for educating diabetic women about UI and methods of management.

P12. COVID 19 Infection and Diabetes at the University Hospital of Bab El Oued

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Introduction: Since the onset of the coronavirus 2019 (COVID-19) pandemic caused by the SARS-CoV-2 coronavirus, diabetes has emerged as one of the most common comorbidities among affected patients. The aim of this study was to describe the epidemiological, clinical, and paraclinical (radiological, virological) characteristics of COVID-19 infection in diabetic patients. **Methods:** We conducted a descriptive study, with prospective collection of data related to COVID-19 infection in diabetic patients hospitalized at the Bab El Oued Hospital Centre from March 25, 2020, to April 26, 2021. The parameters of interest included epidemiological, clinical, and paraclinical (radiological and virological) data. **Results:** Out of 3851 patients hospitalized for COVID-19, 633 were diabetic, i.e., an average frequency of 16.4%. The mean age was 65.9 ± 13.1 years. More than half of the patients (55.1%) were male; the sex ratio M/F was 0.55. More than 93% of the patients had other comorbidities, the most frequently found being arterial hypertension (65.1%) and other cardiovascular diseases in 17.6% of the cases. The main functional signs were asthenia in 74.2% of cases, fever in 70.7% of cases, cough in 58.6% of cases, dyspnea in 27.5% of cases, and diarrhea in 20.1% of cases. The case fatality rate was 25.4% and was more frequent in men (30.3% vs. 19.7%, $P < 0.003$). The mean age of the deceased patients was 72.1 ±10.7 years (minimum 35–maximum 93). Mortality was significantly higher in patients hospitalized for COVID-19 and hypertensive than in nonhypertensive patients (25.4% vs. 12.3%, P <10–6). **Conclusions:** The association of diabetes and COVID-19 has an impact on the prognosis of the disease with a high mortality rate, hence the interest of a particular surveillance of these patients to minimize the risk of progression to severe forms.

P13. The Quality of Life of Diabetics Living in an Urban Area of Algiers

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Background: Diabetes is a chronic sickness that affects quality of life. Our aim was to evaluate the quality of life of diabetics in the commune of Bab El Oued and to research the factors potentially associated with its worsening. **Methods:** The data for this study were taken from the survey on the prevalence of diabetes in the adult population of the commune of Bab El Oued. All cases of diabetes knowing their status were added in this study. The quality of life was assessed by the SF-36 questionnaire. Multiple step-down multiple linear regression was performed to investigate factors associated with quality of life in adults having diabetes. **Results:** The average quality of life numbers of diabetics differs from 44.8 ±18.5 for the "vitality" dimension to 66 ±23.3 for the "social functioning" dimension. Women have lower quality of life than men in all dimensions. With age, the quality of life decreases for the majority of dimensions, except for the mental health dimension. In multiple linear regression, macrovascular complications of diabetes and insulin therapy combined with oral antidiabetics were associated with lower physical and mental scores. Moreover, hyperglycemia, obesity, and the presence of comorbidities were associated with a low physical score, while the use of a psychiatric consultation and low education level

were associated with a low mental score. **Conclusions:** The overall quality of life results for diabetics were lower than the results from the TAHINA-2005 survey in the general population. The existence of macrovascular complications appears decisive on the level of both mental and physical quality of life results.

P14. A Study on Diabetes in Ramadan in Iraq (STUDIAR-IQ)

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Background: Ramadan fasting is one of the five pillars of Islam. Islamic rules have exempted sick people from fasting. However, millions of Muslims with diabetes choose to fast Ramadan. This study aims to examine the effect of Ramadan fasting on people with diabetes and to describe the behavior of people with diabetes in Ramadan in Iraq. **Methods:** This was a physician administered face to face questionnaire conducted shortly after Ramadan 2018. Age, gender, diabetes type and duration, drug history, comorbidities, and last HbA1c were recorded. Duration of Ramadan fasting, hypoglycemia and hyperglycemia events, and pre-Ramadan education were assessed. A total of 543 responses were collected from four different sites in Basra, Iraq. These responses were collected within 2 weeks after Ramadan. **Results:** Females represent 58.1% of the participants. Mean age was 51 years, with mean duration of diabetes of 8.3 years. Majority (90.5%) of the participants had type 2 diabetes. The mean last recorded HbA1c was 9.3%. Majority (75.5%) were on metformin alone or in combination with other medications. However, 51.9%, 12.8%, and 8.6% were on insulin, sulfonylurea, and no medications, respectively. Of the participants, 56.4% have diabetes-related complications. Only 17.6% received pre-Ramadan education. Majority of the patients (73.8%) fasted during Ramadan. Of these, 80.7% fasted the whole month. Only 3.6% of those who fasted experienced severe hypoglycemia. Only 19.7% were checking their blood sugar daily during Ramadan fasting; of them, one patient was using the flush glucose monitor. **Conclusions:** A high proportion of Iraqi patients with type 2 diabetes fast during Ramadan with the majority fast the whole month. However, the level of pre-Ramadan education and glucose monitoring was inadequate. Many patients on insulin fast Ramadan relatively safely without modifying the dose of their treatment or regimen. Minority of patients developed severe hypoglycemia. More programs and campaigns to educate patients with diabetes on the importance of pre-Ramadan counseling are needed.

P15. Clinical Outcomes of Extreme Phenotype COVID-19 Patients with Diabetes Mellitus

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Background: The pandemic of coronavirus disease (COVID-19) caused by SARS-CoV-2 is affecting millions of individuals worldwide. Diabetes mellitus is one of the major risk factors that increase the severity of the clinical outcomes of the COVID-19 patients. This study aims to compare clinical parameters of diabetic and nondiabetic COVID-19 patients who presented with extreme phenotype at Shifa International Hospital, Islamabad. **Methods:** This retrospective clinical data (D-dimers, troponin, C-reactive protein [CRP]) for COVID-19 patients (n = 124) who were either admitted to intensive care unit or had severe respiratory distress were acquired from the electronic medical records of the hospital from December 2020 to March 2021. Data were analyzed using SPSS v 22.0 and are represented as mean ± standard deviation. Statistical significance was set at $P < 0.05$. **Results:** Of the total COVID-19 patients, 63 were diabetics (males 41; females 22) and 61 were nondiabetics (males 40; females 21). Mean plasma random glucose concentration of COVID-19 patients with diabetes was 301.2 mg/dL. Mean age of diabetic patients was 65.8±12.09 years while that of nondiabetics was 51.3±15.68 years. Mean respiratory rate for COVID-19 diabetic and nondiabetic patients was 23.5/min and 23.83/min, respectively. Number of deaths among COVID-19 diabetics and nondiabetics was 14 (22%; males 9 and females 5) and 10 (16%; males 9 and female 1), respectively. Twenty-three COVID-19 patients with diabetes required mechanical respiratory support, i.e., ventilator, compared to 11 nondiabetic patients ($P = 0.07$). Mean concentration of D-dimers (6.082 mg/L) among COVID-19 patients with diabetes was marginally higher than that observed among non-diabetics COVID-19 patients (4.026 mg/L). Mean CRP concentration (261 ±897 mg/L, range 3.2–7190) was significantly higher in COVID-19 patients with diabetes, compared to that of nondiabetic ones (89 ± 80.80; range 0.6–329.5; $P = 0.01$). Similarly, mean troponin concentration (930 ± 4304 pg/ml; range 3–31,976) was also significantly higher among COVID-19 patients with diabetes compared to the nondiabetes ones (272± 982.8 pg/ml; range 3–6145; $P = 0.005$). **Conclusions:** Significantly higher concentrations of CRP and troponin are observed among diabetic COVID-19 patients, compared to nondiabetics. Respiratory support requirement and mortality rate are marginally higher among COVID-19 diabetic patients, compared to the nondiabetics.

P16. Effect of the Pandemic on Quality of Life of Type 1 Diabetes Children in Kuwait

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Background: The rapid spread of the COVID-19 virus led to mandatory lockdowns and strict governmental measures enforcing social distancing among the population which undoubtedly caused an emotional strain on children with type 1 diabetes (T1D). The aim of this study was to evaluate health-related quality of life (HRQoL) and glycemic status in pediatric patients with T1D in Kuwait during the COVID-19 pandemic. **Methods:** Pediatric patients (age <18) and their parents registered in the Childhood-Onset Diabetes Electronic Registry and government hospitals were recruited and consented for this study. To assess disease-specific total HRQoL, parent-proxy and self-reports of the Pediatric Quality of Life Inventory (PedsQLTM) 3.0 Diabetes Module were administered. Hospital records were reviewed to evaluate glycemic status between February 24, 2020, and March 24, 2021. **Results:** Study participants included 150 patients (age 9.5 ± 3.5 years, 51% males, diabetes duration 3.4 ± 2.3 years) where 132 (90%) were cared for in a dual-parent household, 119 (84%) were on multiple daily injections, and 26 (19%) had T1D family history. From the 59 obtainable results, mean HbA1c was 9.78% ± 1.61%. Parent-proxy and patient HRQoL reports did not vary drastically in score (73.1 ± 13.9 and 73.3 ± 11.8). Children self-reported a higher

QoL in the treatment barriers domain ($P = 0.002$) and a lower QoL in the diabetes symptoms domain ($P = 0.04$) of the module. Nationality, age, and sex were not statistically associated with HRQoL. Higher parent-proxy total HRQoL was associated with a longer duration of diabetes prognosis (>3 years) and pump therapy ($P = 0.03$, $P = 0.01$). Patients cared for in a dual-parent household had better QoL scores in the diabetes symptoms domain ($P = 0.04$) and lower HbA1c results those patients in single-parent households (9.6% ± 1.5% vs. 10.9% ± 2.3%). HbA1c or COVID-19 history did not affect total HRQoL. **Conclusions:** History of personal or family COVID-19 infection did not affect HRQoL in this study. However, children recently diagnosed with T1D, treated with multiple daily injections, and cared for by single parents should receive special support during the pandemic to improve their well-being.

P17. Severe Metformin Associated Lactic Acidosis and Acute Kidney Injury Managed with Hemodialysis

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Background: Metformin has a positive effect on type 2 diabetes control, reduction of mortality, and diabetes complications. The risk of metformin-associated lactic acidosis (MALA) is estimated to affect 4.3 per 100,000 patient-years. The risk of MALA is high in setting of advanced chronic kidney disease stage IV/V and acute kidney injury (AKI). We described the clinical outcomes of severe MALA and AKI in diabetic patients. **Methods:** Ethical approval was obtained to conduct a retrospective chart review at Tawam Hospital from January 2020 to August 2021. We included diabetic patients with MALA and AKI managed with dialysis. Clinical outcomes, risk factors, and mortality rate were studied, and descriptive analysis was used. **Results:** Cases series of six patients were included, with a mean age of 59 years, and the male-to-female ratio was 1:1. All the patients had diabetes type 2 with mean HbA1c of 7.2%, and the mean duration ranged from 4 years to more than 20 years. Other comorbid conditions were hypertension ($n = 6$), dyslipidemia ($n = 6$), chronic kidney disease stage I to IIIA ($n = 6$), and ischemic heart disease ($n = 2$). In our cohort, chronic medications included metformin either 1000 mg BID ($n = 4$) or 500 mg OD ($n = 2$), along with other anti-diabetic medications and ACEI or ARB for hypertension ($n = 4$). Clinical symptoms were fatigue/vomiting, poor oral intake, reduce urine output, dyspnea, dizziness, and change in mental status. Laboratory investigations revealed hypoglycemia (mean 4.6 mmol/L), metabolic acidosis mean pH (7.09), lactic acid level (mean 11.8 mmol/L), mean bicarbonate level (10.1 mmol/L), hyperkalemia (mean 6.2 mmol/L), and AKI stage 3 mean creatinine level 705 µmol/L. The majority of patients underwent hemodialysis (83.3%), and one patient had continues renal replacement therapy. Other complications noted in our cohort including sepsis (66.6%), acute respiratory failure needing mechanical ventilation (33.3%), acute fractures postfall (16.6%), and cardiac arrhythmia (33.3%). Lactic acidosis resolved within 48–72 h of dialysis and majority of patients ($n = 5$) had recovery of kidney function. Only one patient was dialysis dependent and no mortality observed. **Conclusions:** MALA is rare, reversible condition that need early recognition and can be successfully managed with renal replacement therapy. Diabetes mellitus patients on metformin are at increased risk of MALA during AKI episodes with concomitant use of ACEI/ARB.

P18. Association Between Glycemic Status and Thyroid Hormones in Patients with Type 2 Diabetes Mellitus

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Background: Thyroid dysfunction has been widely reported to be more common in patients with type 2 diabetes mellitus (T2DM) in various parts of the world. The prevalence of thyroid dysfunction in diabetes varies from 2.2% to 46.5%. Previous studies have shown that thyroid dysfunction is more common in persons with T2DM than in the general population. The aim of this study was to determine the possible relationship between glycemic status and thyroid hormones. **Methodology:** The cross-sectional study was conducted at hormone and diabetes clinic of a tertiary care hospital in Dhaka, Bangladesh. A total of 344 subjects age ranging from 30 to 60 years were included in this study using nonprobability type of purposive sampling. Among the study population, 214 patients were diagnosed as case of T2DM patients, while 130 patients were nondiabetic healthy individuals in control group (matched for age, gender, and weight). Most of them were referred from the outpatient departments of different hospitals and clinics for the evaluation of their thyroid and glycemic status. Written informed consent was taken from every patient after full explanation of the study. A pretested questionnaire was used to collect data from each subject. Their blood samples were tested for glycosylated hemoglobin A1C (HbA1c), free thyroxin (FT4), and thyroid-stimulating hormone (TSH). **Results:** Among T2DM and control subjects, 41.3% and 23.0% were females, respectively. Mean HbA1c was significantly higher in T2DM patients than in the controls (8.15% ± 1.07% vs. 4.8% ± 0.46%; $P < 0.001$). While mean TSH was higher (3.56 ± 1.55 vs. 3.40 ± 1.43 µIU/ml, $P = 0.62$) and FT4 was lower (1.16 ± 0.18 vs. 1.18 ± 0.17 µIU/ml, $P = 0.18$) in T2DM patients than in the controls. HbA1c had a positive correlation with TSH ($r = 0.034$; $P = 0.53$) but negative correlation with FT4 ($r = −0.049$; $P = 0.36$). However, these correlations were not statistically significant. **Conclusion:** In our study, TSH and FT4 were not found to be significantly associated with HbA1c. High serum TSH or low FT4 are not a predictor of glycemic control.

P19. Satisfaction, Expectation, and Need for Education of People with Diabetes

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Background: Diabetes is a chronic metabolic disease, the prevalence of which continues to increase, as do its complications. Therapeutic education aims to help patients to better know and understand their disease and, above all, to become actors in their management. The objective of our study was to evaluate the satisfaction of diabetic patients and to analyze their information and education needs. **Methods:** This was a descriptive cross-sectional survey with an

analytical aim among a representative sample of households in an urban municipality of Algiers. Information was collected by means of a questionnaire and interviews with diabetic patients aged over 18 years, diagnosed more than 1 year, treated by diet alone, oral antidiabetics or insulin. Data analysis was performed using Epi Info software. **Results:** The survey included a representative sample of 268 diabetic patients. More than a third (37.3%) of the diabetics declared difficulties in accessing care, 30.6% were satisfied with the management of their disease, 54.1% declared that they understood how to take their treatment; however, only 31% found it easy to take it every day and 31% declared that they understood the diet or dietary advice given by their doctor and only 9.7% found it easy to follow it every day. Eighty percent of diabetics felt well informed about their disease, the main source of information being their doctor (95.1%), and 68.3% would like more information. Of all the diabetics surveyed, 8.6% received additional education in addition to the usual medical care. In the future, more than 80% of diabetics would like to receive additional education, mainly on an individual basis. **Conclusions:** While the need for information is high, the desire for "educational" approaches concerns more than three quarters of diabetics. These results plead for increased awareness among patients and doctors of the importance of the educational approach.

P20. The Efficacy and Safety of Sodium Glucose Co-Transporter 2 Inhibitors as Adjunctive Treatment in Type 1 Diabetes in Tertiary Care Centre In Saudi Arabia

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Background: Adjunctive treatment with sodium-glucose co-transporters 2 inhibitors (SGLT2-I) has been successfully used in patients with type 1 diabetes mellitus (T1DM) in recent years to improve glycemic control and reduce body weight without increasing the risk of hypoglycemia; however, very few studies were done to evaluate their use in T1DM patients in Saudi Arabia. **Methods:** This study was a retrospective chart review of patients with T1DM, who were prescribed empagliflozin as adjunctive therapy. Baseline characteristics were extracted from patient medical records, and changes in HbA1c, body weight, total daily insulin dose, lipid profile as well as side effects such as urinary tract infections (UTI) and diabetes ketoacidosis (DKA) were evaluated before and after initiation empagliflozin. **Results:** Mean age was 25.8 ± 8.0 years, mean weight was 75.3 ± 14.8 kg, mean BMI was 28.1 ± 6.7 kg/m^2, mean duration of diabetes was 10.1 ±6.5 years, and mean HbA1c was 9.4 ± 1.4%. After a mean follow-up duration of 15.8 ±6.0 months, the mean reduction in the HbA1c% from baseline was 0.82% ($P = 0.001$) and mean weight reduction from baseline was 1.75 kg ($P = 0.097$). Reductions in both SBP and DBP were not significant. A total daily insulin dose decreased by 2.9 units. UTIs and DKA episodes were reported among 3.1% and 11.8% of the participants, respectively. **Conclusions:** SGLT2-I in combination with insulin therapy in Saudi T1DM has shown significant improvement in glycemic control, mild non-significant reduction in body weight, and a significant reduction in total daily dose of insulin. Further larger prospective studies using different SGLT2-I are needed for better evaluation of the efficacy and safety of these agents in Saudi T1DM patients.

P21. Impact of Sodium Glucose Co-Transporter 2 Inhibitors on Alanine Aminotransferase Levels of Patients with Type 2 Diabetes having Nonalcoholic Fatty Liver Disease in Pakistani Population: A Retrospective Cohort Study

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Background: People with type 2 diabetes mellitus (T2DM) tend to have increased tendency of nonalcoholic fatty liver disease (NAFLD) that may lead to nonalcoholic steatohepatitis and cirrhosis. There is also increased risk of cardiovascular events and hepatocellular carcinoma in this group that may result in increased mortality. **Methods:** We retrospectively examined the effects of sodium glucose co-transporter 2 inhibitors (SGLT2-i) when included in treatment protocol of patients with T2DM having elevated alanine aminotransferase (ALT) levels. We collected data of 120 patients with T2DM, using a validated questionnaire tool. Patients were of 30–60 years of age and followed up in Aga Khan University Hospital (AKUH), adult endocrine clinic, during August 2018-July 2019. We used generalized estimating equation (GEE) for the analysis of our longitudinal data. **Results:** A total of 120 patients were enrolled from the Adult Endocrine Clinic. The overall mean age was 48.9 ± 7.3 years and male to female ratio was 1.3:1 (57.5% vs. 42.5%). At the time of initiation of SGLT2-i, the mean BMI was 32.5 ± 5.7 kg/m^2. Approximately, 15% of the patients developed adverse events related to the study drug, most reporting increased frequency of urination (10.2%). Multivarite analysis using GEE showed that after adjusting for LDL and TG, the reduction in mean ALT by SGLT2-i use was observed to have different patterns at different levels in the presence of gender. Among male patients taking 10 mg empagliflozin, there was an average of 4.2 IU/L ($P = 0.02$) decrease in mean ALT levels as compared to female patients not taking any SGLT2-i, after adjusting for LDL and TG. **Conclusions:** We observed that an average reduction in mean ALT when SGLT2-i was added in standard treatment of patients with diabetes having NAFLD. Apart from educating for diet and lifestyle modification, early intervention with SGLT2-i by the clinicians may improve hepatic dysfunction and decrease the morbidity resulting from NAFLD.

P22. The Status of Metabolic Control in Patients with Diabetes Attending Primary Care Clinics in Madinah, Saudi Arabia

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Background: Comprehensive control of diabetes and its related comorbidities is essential to avoid diabetes complications and reduce diabetes care expenses. Nevertheless, several reports have uncovered the gap in diabetes management and confirmed the suboptimal glycemic control globally. This study aims to assess the metabolic control among patients with diabetes attending primary

care clinics (PCCs) in Madinah, Saudi Arabia. **Methods:** A cross-sectional study was conducted at 15 PCCS in Madinah, Saudi Arabia. Consecutive 692 adult diabetic patients who attended the clinics between January 2016 and December 2017 were included. The primary outcome measures were the achievement of blood glucose, blood pressure, and lipids goals. The achievement of adequate metabolic control followed the American Diabetes Association (ADA) guidelines. **Results:** The majority (98%) of the patients had type 2 diabetes (T2DM) with a mean age of 55.1 ± 11.6 years and mean diabetes duration of 11.02 ± 7.8 years. The mean HbA1c was 8.39 ± 1.7, and glycemic goals (HbA1C <7%) were achieved in 15.7%. Achievement of LDL, triglyceride, and HDL goals were as follows; 46.4%. 53.3%, 70.8%, respectively. 66.3% of subjects achieved systolic blood pressure, and 88.7% achieved diastolic blood pressure goals. Younger age, longer diabetes duration, and higher LDL levels were associated with poor glycemic control. **Conclusions:** Glycemic control is inadequate among patients with diabetes following the PCCs in Madinah, Saudi Arabia. A patient-centered approach and individualized management plan considering all risk factors are required.

P23. Correlation between Body Mass Index, Dietary Composition, and Caloric Intake

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Background: Body mass index (BMI) is a simple index of weight for height, which is used commonly in the assessment of nutritional status. A low BMI is often linked with an increased risk of mortality in seriously ill patients, and on the contrary, high BMI is related to cognitive decline and many chronic illnesses. Dietary intake patterns are thought to be associated with BMI, but to which extent has not been investigated in our population. Hence, our study aimed to study the relationship between BMI, food composition, and caloric intake in a cohort of patients from our local population. **Methods:** This observational, cross-sectional analysis was conducted at Medicell Institute of Diabetes, Endocrinology, Metabolism (MIDEM), Karachi, Pakistan, from July 2020 to December 2020. A total of 84 patients were included and their demographic data, comorbidities, the composition of food, and physical activity were registered in a predesigned pro forma. **Results:** Most of our patients were females (72.3%), while 27.7% males. The mean age of the study participants was 40.5 ± 12.7 SD. Diabetes mellitus was the most frequent comorbidity in our patients (51.8%) followed by hypertension in 50.6%. Dyslipidemia was present in 25.3%, metabolic syndrome was present in 19.3%, while 14.5% had impaired glucose tolerance. Overall, 13.3% of the participants were overweight and 85.5% were obese. Median caloric intake was 2285.08 calories, Carbohydrate intake was 1051, fats intake was 810, and proteins intake was 300. Adequate physical activity was observed only in 25.3% of study participants. There was a positive correlation between median caloric intake and the BMI (r = 0.333, P = 0.002). **Conclusions:** The caloric intake was found to be significantly associated with increasing BMI. The predominant caloric intake was from the carbohydrate group. Overall, the caloric intake was much higher than the required amount. Obesity and inactivity were relatively frequent. These results indicate the need to enhance nutrition and encourage healthy lifestyles.

P24. Early Predictors of Gestational Diabetes Mellitus in *In vitro* Fertilization-Conceived Pregnancies

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Background: Gestational diabetes mellitus (GDM) associates with adverse maternal and fetal outcomes. We aimed to identify early GDM predictors, which will enable implementation of preventive and management measures. **Methods:** A 28-week prospective cohort of *in vitro* fertilization (IVF)-conceived pregnant women (<39 years, BMI 18.5–38 kg/m^2) with no known history of diabetes mellitus. Fasting blood samples were analyzed at baseline (pre-IVF) and 12-week of gestation for the following: reproductive hormones, glucose, serum insulin, lipids, thyroid function, adiponectin, and Lipopolysaccharide-binding protein. At 28 weeks, 75-g oral glucose tolerance test was used to screen for GDM. P value <0.05 for significance. **Results:** At 28 weeks gestation (n = 158), 34 women developed GDM and 124 did not. Significant baseline predictors of GDM onset included: greater BMI (29.0 vs. 25.8 kgm^2); older age (34 vs. 32 years); higher levels of follicle-stimulating hormone:luteinizing hormone (FSH:LH) ratio (1.2 vs. 1.0), HbA1C (5.5 vs. 5.2%), insulin (10.6 vs. 7.1 µIU/mL), HOMA-IR (2.2 vs. 1.7), total cholesterol (199 vs. 171 mg/dL), and low-density lipoprotein cholesterol (123 vs. 105 mg/dL); and lower triglycerides (TG) levels (74 vs. 76 mg/dL). Significant 12-week GDM predictors included: greater maternal weight gain (delta: 3.4 vs. 1.5 kg) and higher levels of insulin (11.3 vs. 7.6 µIU/mL), TG (178 vs. 120 mg/dL), and homeostatic model assessment for insulin resistance (2.3 vs. 1.5). 12-week BMI is a predictor of GDM following adjustment for polycystic ovary syndrome status and maternal age. **Conclusions:** In addition to the well-documented predictors of GDM onset (age and preconception BMI), FSH/LH ratio is a potential new predictor. Early IVF-conceived gestational weight gain predicted best GDM onset.

P25. Atorvastatin Attenuates Streptozotocin-Induced Diabetic Retinopathy in Rats

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Background: Diabetic retinopathy (DR) is a complex pathophysiological event and a major cause of blindness in diabetic patients. Hence, the current study was designed to study the effect of atorvastatin on induced DR in rats. **Methods:** The study was conducted on 40 rats divided into four equal groups. Group 1 served as a normal control group. Diabetes mellitus (DM) was induced, by a single intraperitoneal injection of streptozotocin (60 mg/kg) in Group 2 (DR model group), Group 3 (insulin-treated group), and Group 4 (atorvastatin-treated group). Insulin and atorvastatin were administered daily for 8 weeks starting 24 h after induction of DM. All rats were sacrificed at the end of the study, and the following parameters were assessed in each group: glycosylated hemoglobin (HbA1c%), serum malondialdehyde (MDA), retinal histopathological

changes, retinal neuronal cell death, and immunohistochemical detection of both retinal vascular endothelial growth factor (VEGF) and intercellular adhesion molecule 1 (ICAM-1). **Results:** Induction of DM caused marked deterioration in all the measured parameters in the DR control group when compared to the normal control group. Administration of insulin or atorvastatin was associated with marked improvement in the measured parameters in the form of significant reduction of HbA1c%, serum MDA, retinal histopathological changes, retinal neuronal cell death, retinal VEGF, and retinal ICAM-1. **Conclusions:** Atorvastatin attenuates significantly streptozotocin-induced diabetic DR in rats due to its pleiotropic effects on retina including anti-inflammatory and antioxidant effect.

P26. Diabetic Ketacidosis with Severe Hypertriglyceridemia in a Toddler Boy: A Rare Presentation

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Background: Diabetic ketoacidosis (DKA) is an acute metabolic complication occurring in patients with diabetes; especially in patients with type 1 diabetes (T1D), it can be life-threatening. Moderate hypertriglyceridemia is commonly observed in DKA, but severe hypertriglyceridemia is rare; based on our review of the literature, there are few cases reported previously of confirmed pediatric DKA with severe hypertriglyceridemia. **Case Report:** A previously healthy 3-year-3-month-old toddler boy for the first time who presented with DKA, found to have grossly lipemic serum due to extremely high triglyceride (TG) level were observed without evidence of systemic complication and cutaneous manifestation. DKA was treated according to the ISPAD guidelines, insulin was titrated according to blood sugar levels, and patients had uneventful recovery with rapid resolving hypertriglyceridemia. Triglyceride levels were reduced from 10,749 mg/dL to 1431 mg/dL within 5 days after conventional treatment was commenced without plasmapheresis or antilipid medication. Clinicians should be cautious while managing similar types of cases because of the possibility of associated acute pancreatitis which was absent in our case. The patient had an uneventful recovery with rapid resolving hypertriglyceridemia. Triglyceride levels were reduced from 10,749 mg/dL to 1431 mg/dL within 5 days after conventional treatment was commenced without plasmapheresis or antilipid medication. **Conclusions:** Clinicians should be cautious while managing similar types of cases because of the possibility of associated acute pancreatitis which was absent in our case.

P27. Neonatal Outcomes in Babies Born to Women with Diabetes Mellitus in Pregnancy

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Background: The objective of the study is to evaluate neonatal outcomes in babies born to women with either gestational diabetes mellitus (GDM) or preexisting diabetes. **Methods:** This was a retrospective cohort study of 186 pregnant women aged 18 years or older with diabetes mellitus in pregnancy (DIP) admitted to Al Ain Hospital between January 1, 2019, and December 31, 2019. We performed multinomial probit regression to calculate the probability of admission of the baby to neonatal intensive care unit (NICU) associated with each factor. Two sample *t*-tests was used the calculate the difference between the mean cord glucose of babies admitted to NICU/SCBU born to women treated with insulin during labor or with metformin. **Results:** Babies born to women with either pre-existing diabetes were more likely to be admitted to NICU/SCBU compared to those born to women with GDM (95% confidence interval [CI]: 0.79–2.64), $P < 0.0001$. The use of metformin was not associated with increased likelihood of admission to NICU/SCBU (95% CI: −0.86–0.54), $P = 0.65$. The use of insulin during labor was not associated with increased likelihood of admission to NICU/SCBU (95% CI: −1.21–0.65), $P = 0.55$. Multiparty and the presence of other maternal comorbidities were not associated with increased likelihood of admission to NICU/SCBU (95% CI: −1.22–1.23), $P = 0.1$ and (95% CI: −1.23–0.45), $P = 0.4$, respectively. Babies admitted to NICU/SCBU born to women who received insulin during labor had lower mean cord glucose levels compared to those who did not require admission to NICU/SCBU, i.e., 2.2 mmol/l vs. 3.3 mmol/l (95% CI: 1.6–2.7), $P = 0.004$. Babies admitted to NICU/SCBU born to women treated with metformin had lower mean cord glucose levels compared to those who did not require admission to NICU/SCBU, i.e., 2.7 mmol/l versus 3.3 mmol/l (95% CI: 2.2–3.2), $P = 0.01$. **Conclusions:** Our results showed that pre-existing diabetes appears to be a risk factor for admission to NICU/SCBU. The use of Insulin therapy during labor or metformin for treatment of diabetes appears to be associated with lower cord glucose levels.

P28. The Need for Having HbA1c Testing Analyzers at the Point of Care in Clinical Area: Does Make a Difference?

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Background: Given the low adherence and compliance with HbA1c testing frequency and the corresponding delay in the appropriate medication adjustment, point-of-care testing (POCT) for HbA1c provides an opportunity for better control of diabetes and higher patient satisfaction. The data with this regard are limited in Saudi Arabia. Therefore, we aimed to assess the level of patient satisfaction associated with the POCT service implementation for HbA1c and evaluate the differences between the number of requested and conducted HbA1c tests before and after POCT implementation and its effect on glycemic control in Saudi clinical practice. **Methods:** We conducted a single-center ambispective descriptive cohort study in Riyadh, Saudi Arabia. This study had two phases: the retrospective phase (January 2017 to December 2017) and the prospective phase (January 2018 to December 2018). Patient satisfaction was assessed using the patient satisfaction questionnaire short form (PSQ-18) and on-site HbA1c POCT satisfaction questionnaire. **Results:** This study included 75 patients with diabetes (37% type 1, 63% type 2) with a mean age of 44.35 (±17.97) years. The adherence to physician recommendations for HbA1c testing frequency increased from 24% to 85% (before and after POCT implementation, respectively). High levels of satisfaction across seven dimensions of PSQ-18 (77%–88%) were reported toward the provided healthcare service after POCT implementation. Furthermore, a high level of agreement on the

statements of the on-site HbA1c-POCT satisfaction questionnaire was also observed. Finally, the mean HbA1c level has significantly improved after POCT implementation compared to the traditional HbA1c laboratory testing before POCT implementation (8.34 ± 0.67 and 8.06 ± 0.62, respectively, $P < 0.0001$). **Conclusions:** HbA1c testing at POCT improved adherence to recommendations for HbA1c testing frequency for better glycemic control and higher patient satisfaction. POCT reduces turnaround time, improves glycemic control, and facilitates/quickens the decision-making process. HbA1c measurement with POC devices is recommended to be implemented in primary care centers. All of the described benefits of POCT come together to make HbA1c testing, the most common procedure for diabetes management at the point of care. Continued research of accuracy improvements and cost-effectiveness analysis of various POCT systems will increase the development of these POCT systems as the techniques of choice for HbA1c testing in everyday practice in the diabetic treatment centers.

P29. Prevalence of Nonalcoholic Fatty Liver Disease in Obese Type 2 Diabetes Patients in An Endocrine Clinic

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Background: Nonalcoholic fatty liver disease (NAFLD) is the most common cause of chronic liver disease that is expected to become the main cause for liver transplantation by 2030. Its prevalence is increasing globally and regionally, and it is set to become the leading cause of chronic liver disease in many parts of the world. However, the epidemiology and demographic characteristics of NAFLD vary worldwide. About 20%–30% of the patients progress to develop nonalcoholic steatohepatitis (NASH), a subtype of NAFLD, with features of hepatocyte injury such as hepatocyte ballooning. NASH can develop to fibrosis, cirrhosis, and even hepatocellular carcinoma. NAFLD is correlated with obesity and insulin resistance in most cases in the Western world. In Kuwait, obesity prevalence is estimated to be 39% for adult males and 52% for adult females. There is no pharmacotherapy approved for NAFLD treatment, and the main treatment is lifestyle modifications focusing on body fat loss. **Methods:** In 18-month duration, a total number of 306 patients who attended Glycemia Clinic in Kuwait – an endocrine clinic – for general health checkups and follow-ups with an average BMI of 33.6 (kg/m^2) were requested to do an abdominal ultrasound for fatty liver screening. Moreover, out of 306 patients, 218 patients (71% of the patients) were diagnosed with NAFLD; the rest 29% of the patients either did not come back for a follow-up or were not diagnosed with NAFLD. **Results:** 218 patients have NAFLD, 153 patients are females, and 65 patients are males with an average age of 56.4 years and average weight of 87.9 kg. 78% of the patients were diabetic with an average HbA1c of 7.6%. The screenings showed the following NAFLD grading: 83 patients had NAFLD grade 1; 84 patients had NAFLD grade 2; 21 patients had NAFLD grade 3. While 30 patients had no grading, the results showed that they have a fatty liver with no grades mentioned. Fibroscan showed that 13 patients were diagnosed with fibrosis (NASH) and 4 patients were diagnosed with liver cirrhosis. **Conclusions:** 71% of the study population had NAFLD and were unaware of that 6% were diagnosed with (NASH) (F2/F3) and 2% were diagnosed with cirrhosis (F4) by Echosens FibroScan. More research within the gulf area required to increase the awareness of NAFLD with diabetic and obese patients.

P30. Inadequate Dietary Energy Intake and Metabolic Syndrome in Patients Undergoing Maintenance Hemodialysis

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Background: Metabolic syndrome (MetS) or syndrome X is a cluster of cardiovascular risk factors that has been well demonstrated to increase the risk of cardiovascular disease and mortality in hemodialysis (HD) patients. Dietary energy intake (EI) is considered as an important nutritional approach to prevent MetS. The aim of this study was to assess the prevalence of MetS in HD patients and to evaluate the association between daily energy intake with metabolic abnormalities and MetS among HD patients. **Methods:** A total of 157 HD patients were included in this prospective study. The dietary intake was assessed using two 24-h dietary recalls; demographic, anthropometric, clinical, and biochemical data were also analyzed. The frequency of MetS was diagnosed using the National Cholesterol Education Program Adults Treatment Panel III (NCEP-ATP III) criteria. The cutoff values of daily EI were between 25 and 35 kcal/kg/day. **Results:** The results report a prevalence of 22.7% for MetS and 64.5% for inadequate EI. A significant association of inadequate EI with higher prevalence of elevated waist circumference, overweight or obesity, and high total cholesterol levels was disclosed among 60% of the study sample. Furthermore, inadequate EI was associated with a higher proportion of metabolic abnormalities and MetS ($P < 0.05$) in this population. **Conclusions:** MetS is prevalent among HD patients with a risk of developing complications such as cardiovascular disease. Moreover, our results revealed that inadequate dietary energy intake (IDEI) was associated with more MetS abnormalities, especially with general and abdominal obesity and hypercholesterolemia. These results were in line with several previous studies. All these findings reveal that promoting adequate nutritional approaches could help improve dialysis quality and prevent the negative effects of metabolic disorders and hence improve the quality of life of HD patients.

P31. Cardiometabolic Risk Factors in A Cohort of Algerian Thyroid Cancer Survivals

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Background: Cardiovascular disease encountered the leading cause of death in thyroid cancer survivors exceeding death by cancer itself. Etiological factors are the therapy used and the duration of exposure to it, the diagnosis of cancer itself, or the factors that led to this cancer. We aim to evaluate cardiometabolic risk factors in an Algerian cohort of thyroid cancer survival. **Methods:** The study includes a cohort of patients followed in the thyroid cancer register in the Endocrinology Department of Constantine University Hospital between January 2020 and June 2021. Patients have received a complete examination

in addition to an ECG and a fasting blood sample including fasting blood sugar, complete lipid profile, TSH, and FT4. **Results:** 33 patients have been included, mean age was 47 years (28–70), mean age at diagnosis of cancer was 42 (25–64), and 91% were women; type of cancer –63.6% had papillary thyroid cancer, 27.3% had follicular variant of papillary thyroid cancer, 3% had follicular cancer, and 6.1% had NIFTP. All patients underwent total thyroidectomy. Concerning TNM classification, 75.7% were T1 including 33.3% of T1a, 15% were T2, and 3% were T3. 15% were N1. According to the 8th AJCC staging system, 97% were stage 1 and 3% were stage 2. In accordance with the modified 2009 American Thyroid Association (ATA) risk stratification system, 72.7% were at low risk, 21.2% at intermediate risk, and 6.1% at high risk. 60% of patients have received radioiodine therapy. Concerning cardiometabolic risk factors, 36.4% had hypertension which was diagnosed after thyroid cancer surgery in 18.2%. 21.2% were diabetic or prediabetic with the diagnosis made after surgery in 6.2% of patients, dyslipidemia was diagnosed in 48.5% of patients and 78.8% of patients were overweight or obese. Just one patient was a current smoke. **Conclusions:** In this cohort of Algerian thyroid cancer survivals, the risk of death by cancer is low in most cases; however, cardiometabolic risk factors are prevalent and more attention for cardiovascular prevention is needed for these patients.

P32. Graves' Disease in Oman: Incidence, Epidemiological Profile, and Clinical and Biochemical Outcomes

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Background: Since Graves' disease is one of the common thyroid diseases, it is important to determine the prevalence of Graves' disease to assess the magnitude of the problem in Oman. This study was conducted to evaluate the prevalence, patient demographics, and features of Graves' disease among Omani patients with thyroid abnormalities as well as determine treatment options available in Sultan Qaboos University Hospital (SQUH) for patients with Graves' disease. **Methods:** This retrospective cross-sectional study was conducted in SQUH - tertiary healthcare center in the Sultanate of Oman. This study was carried out from January 2015 to January 2020 and included all adult patients with thyroid abnormalities. Data were collected from patients' medical records and analyzed using the SPSS program. **Results:** Of 231 patients who underwent thyroid scan (Tc-99 m) and thyroid ultrasound, 66.2% were presented with Graves' disease. There was a statically significant association between Graves' disease and thyroid radiological features, where nodules presented in 47.4% of Graves' cases ($P < 0.001$), vascularity was increased in 82.4% of Graves' cases ($P < 0.001$), and thyroid scan showed an increase of the uptake in 97.7% of Graves' disease cases ($P < 0.001$). From biochemical features, TSH receptor autoantibodies (TRAb) were significantly associated with Graves' disease ($P = 0.02$) which was increasing in 76.3% of Graves' disease cases. **Conclusions:** Most of the patients admitted to SQUH were young, aged females in Muscat and North Al Batinah with increasing utility of carbimazole while surgery use was declining. The investigatory findings are important for public health for early detection and early management of Graves' disease as well as minimizing morbidity and mortality rate associated with it.

P33. Clinicopathological Characteristics and Treatment Outcome of Patients with Metastatic Differentiated Thyroid Cancer

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Background: Differentiated thyroid carcinoma (DTC) is a slow-growing tumor with 20% of the cases having distant metastasis. Its prognosis can vary in accordance with its histological characteristics, extension and spread. The data on metastatic DTC patients in Pakistan are scarce; therefore, the purpose of our study was to assess the clinicopathological characteristics and treatment outcomes of metastatic DTC in our population. **Methods:** This retrospective, single-center study was carried out on 117 patients with metastatic DTC with their age at diagnosis, gender, tumor size, extent and spread of tumor, and its histologic characteristic recorded. The treatment they received and the outcome in terms of status at the last follow-up were also recorded. **Results:** The median age of diagnosis was found to be 46.6 ± 17.2 years with an almost equal male to female ratio. The most common site of metastasis was the lung followed by bone. Papillary carcinoma was the most common subtype, with 89.7% of the cases followed by follicular carcinoma occurring in 7.7%. The overall survival in years was found to be 5.6 ± 2.6 years. Ninety-six percent had completed surgical resection followed by RAI in 91.5%. Age, the extrathyroidal extension of the primary tumor, and distant metastasis are the main factors in predicting the outcome in metastatic DTC. **Conclusions:** Our study shows that the most significant factor in predicting the outcome in metastatic DTC are age, the extrathyroidal extension of the primary tumor, and distant metastasis. However, further multicenter studies done on a much larger population will be needed to further support and strengthen our results.

P34. Subacute Thyroiditis: Epidemiological, Clinical, Biochemical, and Radiological Features

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Background: Subacute thyroiditis is an inflammatory disease of the thyroid that is usually caused by a viral infection; this study is aimed to estimate the incidence of subacute thyroiditis in patients at Sultan Qaboos University Hospital and to determine the epidemiological, clinical, biochemical, and radiological characteristics as well as the treatment choices that were employed to the patients; this study hopes to improve the patients care and add to the body of knowledge. **Methods:** This is a retrospective study in which the medical records of 150 patients admitted to the radiology department who were diagnosed with subacute thyroiditis between January 2015 and January 2020 were reviewed. SPSS program was used for the descriptive analysis. **Results:** The incidence rate of subacute thyroiditis was 115/1000 population who underwent thyroid uptake scan, mean age was 41.7 ± 14.6; 71% were females. The female to male ratio was 2.5:1, and 65% of the patients were middle-aged at the time of presentation. Palpitation was present in 55% of the patients followed by goiter and tenderness in 29% of the patients. Mean free thyroxin (FT4) was 35.4 ± 21.7 and mean of thyroid-stimulating hormone (TSH) was 0.3% ± 0.8, 62% of the patients had high erythrocyte sedimentation

rate and 63% had elevated C-reactive protein. Thyroid ultrasound revealed 56% of the patients had thyroid nodules; the majority had normal vascularity in color Doppler ultrasound. 82% of patients had low uptake in thyroid scintigraphy. Beta²-blockers were prescribed for 47% of the patients, and nonsteroidal anti-inflammatory drugs (NSAIDs) were prescribed for 37% of the patients, and 20% were not taking any medication. **Conclusions:** This study showed that females are more susceptible to subacute thyroiditis; the most common presenting symptom in subacute thyroiditis patients is palpitation. Biochemical tests revealed an elevation in FT4 levels and suppression in TSH levels in the majority of the patients. Nodules were the most prominent feature in thyroid ultrasound. Beta²-blockers are widely used in managing subacute thyroiditis.

P35. Management of Metastatic Patients with Differentiated Thyroid Carcinoma (2015–2018)

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Background: The differentiated thyroid carcinoma (CDT) represents in Algeria the 3rd female cancer, with an exponential increase for 10 years. In 2015: 7.2% of all cancers in women, and an estimated incidence of 13.2 per 100,000 women. In 2017: rose to 9.1% of all cancers in women, and the incidence rose to 18.7 per 100,000 women. **Methods:** This was a retrospective study of 31 metastatic patients with CDT treated in the Endocrinology Department at the CPMC over a period of 4 years (from January 2015 to December 2018). The parameters taken into account are anamnestic, clinical, para-clinical, and response data after iratherapy. **Results:** We collected 31 patients with a mean age of 48 years with a history of familial goiter in 18 cases and papillary thyroid carcinoma in 3 cases; metastases are present at the time of diagnosis in 6 cases. The average duration of the disease is 4 years, behind the spread of metastatic disease. Total thyroidectomy was made in 28 cases and lymph node dissection in 12 cases. A pure papillary CT is found in 23 cases and extracapsular invasion in 12 cases. We count 18 cases of pulmonary metastases, count 13 cases of bone metastases, and deplore 2 deaths. **Conclusions:** The prognosis of metastatic CDT depends on the age of onset of the disease, the time to treatment, and the location of the metastases. For bone locations, iratherapy did not provide healing in our series, unlike lung locations which have a better prognosis.

P36. Cardiovascular Risk Categories and Achievement of Cardiovascular Risk factor

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Background: The number of young adults with type 2 diabetes is increasing, and little is known about these patients which remains less represented in clinical trials. We aim to assess global cardiovascular risk and achievement of major cardiovascular risk factors in a cohort of type 2 diabetes patients aged <40 years and living in Bejaia. **Methods:** We retrospectively evaluate files of 40 patients with type 2 diabetes aged 18–40 years, attending the house of diabetics in the city of Bejaia in Algeria. Patients have been called to complete lacking information. Assessment of major cardiometabolic risk factors has been made to determine global cardiovascular risk and to evaluate the achievement of treatment targets recommended in recognized guidelines. **Results:** The mean age at diagnosis was 34.85 years (20–39), the mean duration of diabetes was 7.70 years, and 55% were females. 20% were current smokers, 7.5% were consuming alcohol regularly, 42% had hypertension, 87% were overweight or obese, mean A1C 7.3% (5.3–12.30), and 67.5% had dyslipidemia. Assigned to cardiovascular risk categories following ESC EASD 2019, patients had moderate, high, and very high in 2.5%, 47.5%, and 50%, respectively. Achievement of cardiovascular risk factor targets was 50% for A1c<7%, 40% for LDL <1.0 g/l, and 12.5% for LDL <0.7 g/l; and 67.5% for systolic blood pressure <140 mmHg. Only 17.5% are at target for the tree major cardiovascular risk factors. **Conclusions:** Despite being at high or very high cardiovascular risk, only a few patients are at target for cardiovascular risk factors.

P37. The Differentiated Carcinoma of Follicular Strain of Thyroid: About Family Cases

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Background: Thyroid cancer (TC) is the most common endocrine malignancy with an increased incidence rate. Papillary thyroid carcinoma (PTC) constitutes 80% of all TC and 5%–15% of these cases are considered familial, called familial papillary thyroid carcinoma (FPTC), which have been proposed as an aggressive clinical entity. A specific genetic defect responsible for this disease and its inheritance has not yet been established. **Methods:** This was a descriptive and retrospective study of 13 families, with a total of 27 patients with FPTC, supported in the Endocrinology Department at CPMC from January 2004 to January 2018. The parameters taken into account are anamnestic, clinical, para-clinical, and response data after ira-therapy. **Results:** We collected 27 patients with a mean age of 46 years with a history of familial goiters in 65% of cases. First-degree relatives are found in 74%. Ablative surgery type: total thyroidectomy in 85% of cases, and lymph node dissection in 55% of cases. A pure papillary TC is found in 74% of cases and a histological variant in 19% of cases; capsular effraction in 52% of cases; and multifocality in 41% of cases; as well as 6 cases of lymph nodes metastases and 4 cases of distant metastases. **Conclusions:** Despite the presence of adverse histopathological prognostic features, surgical and isotopic treatment has been shown to be curative in most patients with FNMTC, who show good progression, without evidence of a high rate of metastases, with overall survival of patients not seeming to be affected.

P38. Circulating IL17A and IFN-Gamma Serum Levels in Cirrhotic Hepatitis C Virus Infected Patients with Autoimmune Thyroiditis

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Background: Autoimmune endocrine disorders are considered one of the extrahepatic manifestations of hepatitis c virus (HCV) infection. HCV could trigger cytokines release due to local inflammation. Interleukin 17 a (IL17a) and interferon gamma (IFNγ) play an important role in pathogenesis of autoimmune disease. Herein, we tried to assess the serum levels of IL17a and IFN-gamma in cirrhotic HCV-infected patients with autoimmune thyroiditis. **Methods:** Serum samples were collected from 183 cirrhotic HCV-infected patients. Sera were screened for antinuclear antibody (ANA) by ELISA, and those who were positive for ANA ($n = 40$) were screened for thyroid peroxidase (TPO) antibodies by indirect Immunofluorescence. IL17a and IFNγ serum level were measured by ELISA in ANA-positive HCV group ($n = 40$) and ANA-negative HCV group ($n = 24$) and compared to a healthy control group ($N = 24$). **Results:** Forty patients (21.8%) were found positive for ANA. Seventeen patients were reported positive for TPO (42.5%). Serum IL17a and IFN-gamma levels were significantly higher in TPO, ANA-positive group than ANA-negative group ($P < 0.005$,, $P < 0.05$) and control group ($P < 0.0001$, $P = 0.09$), respectively. **Conclusions:** The elevated serum level of IL17a and IFN-gamma in cirrhotic HCV patients with autoimmune thyroiditis suggests that these cytokines play a role in the pathogenesis of autoimmune disorders related to HCV extrahepatic manifestations.

P39. Autoimmune Hypothyroidism in Pregnancy, And Its Consequence for the Fetus

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Background: Thyroid disorders are the most common endocrinologist disorders in pregnancy. Thyroid autoimmunity is linked to subfertility, miscarriage, preterm birth, gestational diabetes, and adverse neurodevelopmental sequelae in children. **Methods:** We conducted a retrospective chart review of women who delivered between June 2017 and June 2018. After exclusion for incomplete data, 384 women were studied. The subjects were divided into three groups: hypothyroid in pregnancy with thyroid antibody (Ab), hypothyroid in pregnancy without thyroid-Ab, and euthyroid in pregnancy. Maternal and neonatal outcomes were defined. **Results:** Hypothyroid women with Ab had higher rates of previous miscarriage than euthyroid women 34% versus 15.4% ($P = 0.0052$). They also had smaller for dates babies, 10% versus 5.9% ($P = 0.0323$), increased rate of NICU admission 21.7% versus 8.5% ($P = 0.0068$), and intrauterine death 5% versus 0.5% ($P = 0.0479$). **Conclusions:** This study provided further confirmation that thyroid autoimmunity has deleterious effects on pregnancy outcomes.

P40. Hyperprolactinemia: Epidemiological, Clinical, Biochemical, and Radiological Features

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Background: Prolactin is a polypeptide hormone produced by the lactotroph cells in the anterior pituitary gland. Prolactin's main function is to promote milk production and to sustain lactation after childbirth. Hyperprolactinemia is one of the most common hypothalamic pituitary disorders that occur in females, and it is defined as elevated prolactin levels in the blood. Hyperprolactinemia generally causes adverse effects on the reproductive system and bone density and may be associated with psychiatric manifestations. Hyperprolactinemia is caused by any disease that affects prolactin secretion and clearance, which includes prolactinoma and drug-induced hyperprolactinemia. Hyperprolactinemia therapies aim to reduce the gland size and reduce the effect of symptoms. **Aim and Specific Objectives:** The purpose of this study is to identify hyperprolactinemia patients admitted to Sultan Qaboos University Hospital (SQUH) and to describe their epidemiological, clinical, biochemical, treatment, and radiological characteristics. **Methods:** This is a retrospective cross-sectional study conducted at SQUH. The Hospital Information System (HIS) of the SQUH was utilized to obtain the Medical Record Numbers (MRN) with a total of 150 patients. The patient's symptoms, etiologies, and treatment options were extracted from the TrackCare© system and were analyzed using bar charts, pie charts, and descriptive tables. **Results:** The mean age of the patients at the time of prolactin evaluation was 38 ± 12.5 years. The mean serum prolactin level of the total sample was 1061.64 ± 974.18 mIU/L. Most patients presented with menstrual cycle disturbances (50.0%), followed by mood changes (28.0%) and headache (27.3%). The most common cause of hyperprolactinemia was drug-induced hyperprolactinemia (38.0%), followed by idiopathic hyperprolactinemia (26.7%), and prolactinoma (20.0%). Microprolactinoma was the major prolactinoma present at 87%. 30% of patients were applied to a treatment plan; the most used treatment was cabergoline (22.7%), followed by surgery (4.0%) and bromocriptine (2.0%). **Conclusions:** This study showed that the hyperprolactinemia profile in Sultanate of Oman showed similar patterns to the rest of the world. Except for mix reports in the etiologies patterns of hyperprolactinemia in other countries, most epidemiological characteristics, presenting symptoms, and radiological features results were similar to the results of other studies done in other countries. This study demonstrates the current profile of hyperprolactinemia in the Sultanate of Oman. The result of this study will be helpful in establishing a better healthcare system and a better understanding of patients with hyperprolactinemia.

P41. Echocardiogram Evaluation in Hyperprolactinemia Patients on Cabergoline

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Background: Cabergoline is the first-line treatment for patients with lactotroph pituitary tumors. Due to the activation of 5HT2B serotonin receptors, side effects of cabergoline include increased risk of fibrotic cardiac valvulopathy. Although the former complication was mainly reported in patients with Parkinson's disease receiving high doses of cabergoline, a recent meta-analysis of case–control studies has reported threefold increased risk of tricuspid regurgitation in hyperprolactinemic patients treated with cabergoline. Regulatory bodies, including the FDA, recommend regular echocardiography surveillance at baseline and every 6–12 months thereafter. This audit aims to review the compliance rates with echocardiography screening in patients with hyperprolactinemia treated with cabergoline. **Methods:** We conducted a retrospective audit at Hamad General Hospital in patients receiving cabergoline treatment for hyperprolactinemia. We extracted data from the patients' electronic medical records. **Results:** We included 257 patients; of which 187

(65.4%) were females. The mean age was 35 ± 10.2 years. Pituitary microadenoma was diagnosed in 113 (44.8%) while macroadenoma was diagnosed in 60 (23.8%). Cabergoline treatment was started at a mean dose of 0.62 ± 0.4 mg/week and was continued in 89.5% of the patients at the same dose. Baseline echocardiogram was done in 4.3% of the patients. Over the 4 years period, 89.1% of the patients did not have any echocardiography screening. Of those who did have echocardiography (28 patients) there were three cases of fibrotic valvulopathy; one at baseline and two detected during follow-up. **Conclusions:** This is the first report from Qatar on the rates of echocardiography screening in patients with hyperprolactinemia treated with cabergoline. There is quite a low rate of compliance with echocardiography recommendations. Due to the low rate of surveillance, it is hard to draw any conclusion on the rates of fibrotic valvulopathy in Qatar.

P42. Sex Differences in Clinical, Biochemical, and Radiological Presentation of Patients with Hyperprolactinemia

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Background: Lactotroph adenomas are the most common hormone-secreting pituitary tumors, accounting for 30%–40% of all pituitary adenomas. It is known that females tend to present earlier than males, but the sex differences in the pathology and response to treatment have not been reported in Qatar. **Methods:** We conducted a retrospective audit at Hamad General Hospital in patients receiving cabergoline treatment for hyperprolactinemia. We extracted data from the patients' electronic medical records. We categorized the prolactin levels as normal (<450 mIU/l) or elevated (>450 mIU/l). **Results:** A total of 257 patients had hyperprolactinemia, 89 patients were males (32.2%), and 187 were females (67.8%). The males were older than females: mean age 41.7 ± 11.4 years verss 35 ± 10.2 ($P < 0.001$). The median prolactin level at diagnosis was higher in males than females (5845 mIU/l [interquartile range (IQR) 1210–14340] vs. 1628 mIU/l (1029–2671), $P < 0.001$). Macroadenoma was the common cause of hyperprolactinemia in males, i.e., 43 (55.85); while microadenoma was the most common cause of hyperprolactinemia in females, i.e., 93 (53.1%). The mean weekly starting dose of cabergoline was significantly higher in males than females (0.8 ± ±0.4 versus 0.5 ± ±0.4, $P < 0.001$). Over 4 years of follow-up, more males achieved normal prolactin levels than females (64.1% vs. 52.2%, $P = 0.072$). **Conclusions:** To our knowledge, this is the first report on the sex differences in the clinical and biochemical presentations in patients with hyperprolactinemia. Males tend to present at an older age, with higher levels of prolactin. and are more likely to have macroadenomas compared to females. However, despite having a more aggressive disease, the treatment response was numerically higher in males compared to females – albeit not statistically significant. Long-term follow-up is needed to examine the difference in remission rates.

P43. The Use of Magnetic Resonance Imaging Pituitary in Evaluating Hyperprolactinemia Patients

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Background: Magnetic resonance imaging (MRI) of the pituitary gland is indicated in all patients with prolactin to establish the underlying etiology. Annual MRI pituitary is indicated in patients with pituitary macroadenoma, increasing prolactin level, or if new symptoms have developed. This audit aims to evaluate the use of MRI pituitary in managing patients with hyperprolactinemia. This audit aims to evaluate the use of MRI pituitary in managing patients with hyperprolactinemia. **Methods:** We conducted a retrospective audit at Hamad General Hospital in patients receiving cabergoline treatment for hyperprolactinemia. We extracted data from the patient's electronic medical records. We categorized the prolactin levels as normal (<450 mIU/l), intermediate (450–4000 mIU/l), and elevated (>4000 mIU/l). **Results:** We included 257 patients, of which 187 (65.4%) were females. The mean age was 35 ± 10.2 years. Pituitary microadenoma was the most common finding in the baseline MRI: 44.8%, macroadenoma in 23.8%, normal scan in 11.1%, empty sella in 2.4%, other findings in 2.4% and it was not done in 15.5%. At baseline, MRI scans were not done in 16.4% and 9.5% of patients with intermediate and elevated prolactin levels, respectively. The rates of annual MRI scans in patients with macroadenoma and persistently elevated prolactin levels ranged between 40% and 60%, while in those with normalized prolactin levels, the rates were 40%–55%. In patients with microadenoma, the rates of annual MRI scans in those with persistently elevated prolactin levels were 40%–60% and in those with normalized prolactin levels wer 40%–50%. **Conclusions:** Our study showed that there was a high rate of an apparent unnecessary MRI scanning in patients with microadenoma who had normal prolactin levels and a reduced rate of annual scanning in patients with persistently elevated prolactin levels. Overall, the yearly scanning rates were similar in both normal and high prolactin levels regardless of the tumor size. This data should be a starting point to develop more precise protocols for managing hyperprolactinemia patients.

P44. Cabergoline Deescalation Practice - A Retrospective Audit

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Background: Cabergoline is the first-line treatment for patients with lactotroph pituitary tumors. It is a long-acting dopamine receptor agonist with a high affinity for D2 receptors. Due to the activation of 5HT2B serotonin receptors, side effects of cabergoline include increased risk of fibrotic cardiac valvulopathy and impulse control disorders, e.g., gambling. The former complication is linked to the cumulative dosage of cabergoline. This audit aims to study the current practice in deescalating cabergoline dosage in patients who achieved normal prolactin levels. **Methods:** We conducted a retrospective audit at Hamad General Hospital in patients receiving cabergoline treatment for hyperprolactinemia. We extracted data from the patient's electronic medical records. We categorized the prolactin levels as normal (<450 mIU/l) or elevated (>450 mIU/l). **Results:** We included 257 patients, of which 187 (65.4%) were females. Pituitary microadenoma was

diagnosed in 113 (44.8%) while macroadenoma was diagnosed in 60 (23.8%). Mean starting dose of cabergoline was (0.8 ± 0.4 mg/week) in patients with macroadenoma and (0.6 ± 0.4 mg/week) in patients with microadenoma. Over 4 years of follow-up, 55.6% of the patients achieved normal prolactin levels; 65% in those with microadenoma and 35% in those with macroadenoma. In those who achieved normal prolactin levels, the mean dose of cabergoline remained unchanged at 0.6 ± 0.4 mg/week. In those with persistently elevated prolactin levels, the mean dose of cabergoline increased to 1.0 ± 1.1 mg/week. The cumulative discontinuation rate of cabergoline over this period was 10.0%. **Conclusions:** There is a low tendency to deescalate the dosage of cabergoline. There is a low tendency to deescalate the dosage of cabergoline in patients with hyperprolactinemia who achieved normal prolactin levels, increasing their exposure to the treatment. As outlined, the fibrotic valvular complications are linked to the cumulative dose of cabergoline. Hence, we recommend that the dosage of cabergoline in patients with hyperprolactinemia should be tapered down and stopped in patients who achieve normal prolactin levels – after careful assessment.

P45. Adult Patients with Ectopic Neurohypophysis and Panhypopituitarism due to Hypoplastic Stalk and Adenohypophysis

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Background: Congenital hypopituitarism (CH) is characterized by a deficiency of one or more pituitary hormones. Many transcription factors and signaling molecules are involved in the development of the pituitary gland, and mutation of genes can cause defect in the production of these transcription factors that can cause congenital hypopituitarism. Ectopic posterior pituitary with hypoplastic pituitary usually associated with isolated hypogonadotropic hypogonadism and rarely with panhypopituitarism. **Case Presentation:** A 17–year-old man presented for the evaluation of poor secondary sexual character to us. He was born as a low-birth-weight baby with AGA. On examination, his height was 151 cm, his mid parental height was 160 cm, and his target height of 166.5 cm. He had micropenis with bilateral testes of 2cc and SPL of 3 cm; no axillary and pubic hair. He did not have anosmia. He had facial asymmetry with skeletal deformity. MRI of the pituitary showed an ectopic posterior pituitary gland with the hypoplastic pituitary gland and pituitary stalk. Hormonal evaluation showed panhypopituitarism, his serum cortisol was low, low FT4 and low FSH, LH, and testosterone. He has GnRH stimulation which showed low testosterone with low FSH and LH indicating hypogonadotropic hypogonadism. In conclusion, as his anterior pituitary hormone was low, we did not test for GH hormone due to financial reasons and nonavailability of GH estimation at our laboratory. Hence, he has started glucocorticoid supplementation followed by levothyroxine and testosterone initiation. **Conclusions:** This case report demonstrated a case of panhypopituitarism with ectopic posterior pituitary along with hypoplastic stalk and anterior pituitary. He was also having facial asymmetry, a skeletal abnormality who had presented to us for a poor secondary sexual character at an age of 17 years. Hence, he was appropriately treated with hormonal replacement. CH is characterized by a deficiency of one or more pituitary hormones along with deranged development of pituitary glands. Appropriate hormonal replacement is the key to treat panhypopituitarism for normal growth and development.

P46. Severe Refractory Hypocalcemia after Parathyroidectomy for Hyperparathyroidism and Parathyroid Adenoma in a Patient with Prior Bariatric Surgery: A Rare Case Report

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Background: Obesity affects over 300 million individuals worldwide, and many of them are surgically treated. Roux-en-Y gastric bypass (RYGB) is a bariatric procedure aimed at weight reduction in morbidly obese patients. It bypasses the anatomical sites for calcium and vitamin D absorption, thus placing patients at risk for altered calcium homeostasis. Gastric surgery reduces gastric acid; therefore, calcium may not be effectively absorbed. Hypothalamus–pituitary–parathyroid axis is affected by the changes in gastrointestinal tract, and the secondary hyperparathyroidism (SHPT) caused by the deficiency of Vitamin D, is an important issue after bariatric surgery. In most RYGB patients, normocalcemia is maintained with a compensatory SHPT. Long-term hypocalcaemia may cause development of parathyroid adenoma as a result of parathyroid gland stimulation.We present a case study of a patient with a history of RYGB who developed a parathyroid adenoma and consequently underwent a parathyroidectomy. We describe challenges we encountered in the clinical management of this case with refractory hypocalcaemia. **Case Report:** We present a challenging case report of a patient with history of RYGB who underwent parathyroidectomy and consequently developed refractory hypocalcaemia. Hypocalcaemia was managed conservatively initially but subsequently required higher doses of both intravenous and oral calcium along with teriparatide. Patients postbariatric surgery including those who have undergone Roux-en-Y who are proceeding with parathyroid procedures should be followed up closely for hypocalcemia. **Conclusions:** This is a challenging case of refractory hypocalemia postpartial parathyroidectomy in a RYGB treated with a twice daily regimen of teriparatide. In patients postbariatric surgery including those who have undergone Roux-en-Y, it is essential that those who are proceeding with parathyroid procedures are followed up closely and regularly for hypocalcemia and to start on regular oral supplements of calcium citrate, Vitamin D, and teriparatide at an early stage if calcium level does not improve with oral supplements.

P47. Serum Vitamin D Status in Libyan Preterm Babies

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Background: Preterm birth (PTB) refers to the delivery of babies before the completion of 37th week of pregnancy, and in such children, the incidence of Vitamin D (vit D) deficiency/insufficiency is studied. The present study is undertaken to bring out the relationship between vit D deficiency and its effect on biochemical parameters calcium, phosphorus, and alkaline phosphatase in preterm babies and compared with full-term babies. **Methods:** The serum sample from the preterm infants was collected from Neonatal Intensive Care Unit of Altawra Hospital, Albayda, or labor room between February and July 2019.

Two groups of infants studied were preterm infants ($N = 62$) and control group full-term infants ($N = 34$). The concentration of serum calcium, phosphorus, alkaline phosphatase, and 25OH-Vitamin D from cord blood or venous blood from preterm and full-term infants was measured by enzyme immunoassay and routine methods, respectively. **Results:** 62 preterm neonates were taken for the study (median gestational age 32 weeks [28–36] weeks, median birth weight 1960 g [900–2800] g, median calcium 8.7 mg/dl [$P = 0.000$], median phosphorus 4.1 mg/dl [$P = 0.584$], median alkaline phosphatase 458 U/L [$P = 0.008$], and median vit D level 13.6 ng/ml.) The vitamin deficiency was : very severe vit D deficiency was 9.7% (<5 ng/ml), severe vit D deficiency was 19.4% (5–10 ng/ml), vit D deficiency 45% (10–20 ng/ml), and suboptimal vit D 25.8% (20–30 ng/ml).When we compare preterm to control (full-term infants), we found that the P value is very highly significantly ($P < 0.000$). **Conclusion:** We found that all preterm infants have vit D deficiency 99.9%, with no significant relation to gestational age and sex. The correlation between vit D deficiency and the biochemical parameters was proportional; when Vit D level is low, the ALP level is high ($P = 0.008$) and Ca level is normal or low ($P = 0.000$).

P48. Presentation, Management and Outcomes of Patients Admitted with Vitamin D Toxicity: A Retrospective Study at a Tertiary Care Hospital in Karachi, Pakistan

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Background: In spite of the high prevalence of Vitamin D deficiency among the Pakistani population, there have been recent reports of iatrogenic hypercalcemia secondary to Vitamin D toxicity (VDT) from Pakistan. We aimed this study to determine the clinical manifestations, biochemical features, and underlying risk factors as well as to evaluate the therapeutic management and outcomes of patients presenting with VDT. **Methods:** This retrospective study was conducted at the Aga Khan University Hospital (AKUH), Karachi, Pakistan. Chart review of 10 years of data from June 1, 2009, to May 31, 2019, was done using ICD coding. Patients with age greater than and equal to 18 years of either gender with serum calcium above 10.2 mg/dl and serum 25-vitamin D level above 100 ng/ml were included in the study. Patients were excluded if diagnosed with hypercalcemia with an underlying granulomatous, lymphoproliferative, or metastatic disease and/or hyperparathyroidism (hormones level >87 pg/ml). Data analysis was done by using STATA version 14. **Results:** A total of 814 patients with hypercalcemia were screened and only 72 patients fulfilled the inclusion criteria. Out of 72 patients, 62.5% were female and 37.5% were male. The mean age was 66.3 ± 14.9 years. The most common presenting complaint was acute kidney disease, 66.7%, accompanied by generalized weakness 45.8%, altered sensorium 43.1%, constipation 43.1%, nausea 36.1%, body ache 29.2%, and vomiting and anorexia 27.8%. On presentation, 28 (39.4%) patients reported a history of Vitamin D supplements intake either in the form of capsule 57.1%, injection 28.6%, or both 14.3%. Three-quarter patients received Vitamin D supplements upon prescription and 25% of patients self-administered the Vitamin D supplements without any prescription. During the hospital stay, all the patients received intravenous fluids. Around half of the patients who received bisphosphonate. Calcitonin, and furosemide were given to 29.2% and 27.8%, patients, respectively. Steroids were also administered in 27.8% of patients either orally or intravenously (70% and 30%, respectively). The mean length of stay was 4.5 ± 2.4 days. **Conclusions:** VDT is an important ongoing health issue with an increasing incidence, because of self-medication and widespread prescription. Education and awareness of public and healthcare providers regarding this entity are the need of time, along with legislation to ensure restricted, limited, and good-quality Vitamin D formulation to reduce burden from healthcare system caused because of injudicious use of these supplements.

P49. Silicone-Induced Granuloma: An Unusual Case of Calcitriol–Mediated Hypercalcemia

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Background: Cosmetic silicone injections are known to cause acute and chronic complications, including local inflammation and granulomatous reaction. The onset of these events is variable and can present years following the initial procedure. We report a case of granulomatous disease following silicone injection causing calcitriol-mediated hypercalcemia. **Methods:** Here, we describe the case of a 33-year-old male-to-female transgender patient, with a surgical history of body contouring including bilateral breast silicone implants and gluteal augmentation via free silicone injections, presenting to the hospital with complaints of abdominal pain. **Results:** Initial laboratory workup revealed severe hypercalcemia (Ca = 14.2 mg/dl) and acute kidney injury (Cr = 2). Further laboratory tests demonstrated suppressed PTH level (7.8 pg/ml), normal 25-hydroxyvitamin D (35.8 ng/ml), with elevated 1,25-dihydroxyvitamin D level, measured at 196 pg/mL (normal range: 19.9–79.3 pg/mL), hence raising the possibility of an underlying granulomatous disease. Sarcoidosis and tuberculosis workup, including a computed tomography (CT) scan of the lungs/mediastinum, was negative. Positron emission tomography/CT showed symmetric hypermetabolic subcutaneous stranding of bilateral gluteus and proximal thighs corresponding to the injection sites. It did not reveal any suspicious lymph nodes. Tissue biopsy of the involved areas demonstrated foreign body granulomatous reaction, likely due to silicone deposits. The patient's calcium and 1,25-dihydroxyvitamin D level responded rapidly and completely to corticosteroid treatment. **Conclusion:** Hypercalcemia from cosmetic injections is rare but can be severe and life-threatening. Knowing the growing prevalence of body contouring enhancement with injections, implants, and fillers, the diagnosis of silicone-induced hypercalcemia should be considered in patients with a history of cosmetic surgery presenting with elevated calcium level, after ruling out other causes of calcitriol-mediated hypercalcemia.

P50. Modeling Fat and Lean Changes: How These Changes May Introduce Artifact to DXA

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Background: Weight gain and weight loss can have different effects on DXA measurement of BMD partly from real changes in BMC and partly from artifact and imprecision. DXA instruments compare

BMD over the bone region of interest (ROI) with a reference area (ref) where bone is absent. Artifacts may originate from the ROI, the ref area, or both. The literature has not clarified the differential effects of lean and fat changes over the ROI and over the ref area. **Methods:** We modeled changes in fat and lean by using water or fat overlying both the ROI and the ref area of the Hologic spine phantom, testing on a Hologic Discovery densitometer. Vegetable oil and water in plastic trays and 6.5 cm blocks of lard were used to model overlying fat and lean. **Results:** We found that >13 cm lard overlying the ROI deteriorated the image and severely deteriorated ROI edge detection. Increasing from 0 cm to 8 cm of oil over the ROI and ref area led to progressive decreases in BMC (Pearson $r = -0.98$), area ($r = -0.92$), and BMD ($r = -0.97$). This resulted in 11% decreases in BMC with decreases in BMD of 7%. Increasing from 0 cm to 8 cm of oil over the ROI alone led to 34% decreases in BMC ($r = -0.99$) and decreases in area ($r = -0.99$); this led to dose-dependent decreases in BMD of 19%. Increasing centimeter of oil over the ref led to increases in BMC ($r = 0.97$) and increases in area ($r = 0.95$), which led to increases in BMD of 16% ($r = 0.98$). Trays of water overlying the ROI and the ref area introduced much less artifact than trays of vegetable oil. **Conclusions:** We conclude that fat over both ROI and ref area leads to a dose-dependent artifact in both measured ROI area and BMC. Increasing thickness of fat leads to decreases in calculated BMD. Increasing water overlying the phantom led to less DXA artifacts. These data may help us understand the DXA artifact introduced in obese patients and with changes in patient weight in patients monitored with DXA BMD.

P51. Awareness of Adult and Pediatric Physicians of the Burden, Presentations, and Management of X-linked Hypophosphatemia: Results of an Online Survey from the Middle East and Africa

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Background: Rare endocrine–metabolic diseases represent an important area in the field of medicine and pharmacology. The rare diseases of interest to endocrinologists involve all fields of endocrinology with the possible involvement of multiple endocrine glands such as bone and skeletal tissues. For example, X-linked hypophosphatemia (XLH) is a genetic disease caused by inactivating pathogenic variants in PHEX. resulting in reduced mineralization of bone, teeth, and renal phosphate wasting. XLH is traditionally treated by phosphate and Vitamin D analogs. However, more recently, Burosumab, a recombinant anti-fibroblast growth factor-23 (FGF-23) monoclonal antibody, was approved as specific XLHR therapy. Data are limited on the awareness of genetic and metabolic bone disorders in developing regions such as the Middle East and Africa (MEA). **Methods:** A convenience sample of physicians practicing in the MEA in relevant disciplines was invited to take a web-based survey consisting of multiple-choice questionnaires. It included 20 questions arranged in three domains: (a) demographic and professional profile, (b) general awareness of rare genetic/metabolic bone disease, (c) specific awareness of XLH, (d) symptoms of XLH, and (e) management of XLH). The study was conducted between July and December 2019. **Results:** Out of the complete 262 responses, 139 were eligible for inclusion in the analysis. The largest proportion, 41.7% practice in the Arabian Gulf, 20.1% in the rest of the Middle East, 17.3% in North Africa, and 20.9% in Sub-Saharan Africa. The largest single specialty was endocrinology (adult 35.3%, pediatric 5.7%). When asked thinking of metabolic/genetic bone diseases, which specific diseases, if any, come to mind? 16 (11.5%) responded that they have no knowledge of any metabolic/genetic bone diseases and 123 respondents (88.5%) stated that they could think of some metabolic/genetic bone diseases of these 111 enumerated various genetic and metabolic disorders. Further, when they were given a typical case scenario suggestive of XLH, 18.0% indicated not knowing what disease this description is referring to whereas 82.0% stated having an idea about the condition. Of the latter group, 109 provided suggestions for possible diagnosis; the top single diagnosis was XLH. When they were asked specifically, 88.9% affirmed having heard of XLH and only 11.1% denied it. 43.7% of those who knew it did so from their own general reading and 27.4% from searching in the context of a suspected case. Around three-quarters of respondents were aware of conventional therapy for XLH with Vitamin D and phosphate supplementation. However, 89.8% of respondents welcomed specific biological therapy. **Conclusions:** The survey revealed that the surveyed physicians are reasonably aware of XLH but have variable practice and are unsatisfied with its conventional treatment. Raising awareness of the recognition and modern management of bone metabolic and genetic conditions exemplified by XLH are recommended.

P52. Primary Hyperparathyroidism in Saudi Arabia Revisited: A Multicenter Observational Study

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Background: Primary hyperparathyroidism (PHPT) is a common cause of hypercalcemia and remains understudied within the Arabian population. The present study, the largest of its kind within the Gulf Cooperation Council (GCC) countries, aims to determine the demographics and clinical presentation of PHPT in Saudi Arabia. **Methods:** In this multicenter retrospective study involving three tertiary hospitals in different geographic locations of Saudi Arabia, namely, Riyadh, Al Ahsa and Jeddah, a total of 205 out of 243 confirmed PHPT cases aged 16–93 years were included ($N = 96$ from Riyadh; $N = 59$ from Al Ahsa; and $N = 50$ from Jeddah). Demographics, clinical manifestations, and surgical outcomes were recorded as well as laboratory and radiologic investigations including serum parathyroid

hormone (PTH), 25(OH)D, adjusted calcium, estimated glomerular filtration rate (eGFR), and nuclear scan outcome. **Results:** PHPT cases appeared to increase over time when compared to other local studies published so far. Females outnumber males (3:1), with 86% seen as outpatients. The average age was 59.8 ± 15.5 years. Abnormal PTH scan was seen in 171 patients (83.4%). Kidney stones were the most common renal manifestation (32 cases, 15.6%) and selective cortical bone loss was the most common skeletal manifestation (67 cases, 32.7%). Al Ahsa had the highest prevalence of multiple comorbidities at 54%, and the highest prevalence of obesity was a single comorbidity (17%) compared to other regions ($P < 0.05$). Jeddah recorded the highest prevalence of combined selective cortical bone loss with bone and joint pains (30%) ($P < 0.05$). **Conclusions:** Comparison of the present data with previous local studies suggests an increasing trend in PHPT cases in Saudi Arabia. Regional variations in the clinical presentation of PHPT were observed and warrant further investigation.

P53. Challenging Cases of Parathyroid Carcinoma in Adult Patients

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Background: Parathyroid cancer is a rare endocrine malignancy, with variable severity, genetic risks, and clinical presentation. There is no consensus on the optimal therapeutic modalities for such cancer, with favorable outcomes reported in early recognition, surgical intervention, and radiotherapy in selected cases. We described two cases of parathyroid carcinoma in adult patients. **Methods:** We retrospectively reviewed the clinical, surgical, and pathologic features in two patients with parathyroid carcinoma evaluated at Tawam hospital over the last 2 years (January 2020–September 2021). **Results:** Two cases are described. **Case 1:** a 25-year-old female had end-stage kidney disease on hemodialysis since 2010 and failed two kidney transplants. She had osteoporosis and recurrent fractures involving right and left femur neck. She had hyperparathyroidism and left inferior parathyroid mass, leading to hypercalcemia: 2.76 mmol/L, hyperphosphatemia: 1.93 mmol/L, elevated PTH (470 pmol/L), and Alk phos: 594 IU/L. She was not compliant with oral cinacalcet and was given intravenous etelcalcetide 5 mg and paricalcitol 3 times per week during dialysis with limited response. She underwent left parathyroid mass excision (3.3 cm × 2.9 cm × 2 cm) and pathology revealed parathyroid carcinoma. Postoperatively, she developed Hungry bone syndrome with hypocalcemia and hypophosphatemia that required replacement. Postoperative PTH was 9.3 pmol/L. Genetic testing is pending. **Case 2:** A 37-year-old male with primary hyperparathyroidism (PTH 199 pmol/L) and marked hypercalcemia (4.59 mmol/L). Perioperative localizing imaging revealed an intrathyroidal parathyroid lesion. He also was found to have renal stones, duodenal ulcers with elevated gastrin level, type 2 diabetes, and central hypogonadism with empty Sella on magnetic resonance imaging. Initial genetic evaluation was negative for MEN 1 gene. He underwent right hemithyroidectomy with right parathyroidectomy and pathology confirmed parathyroid cancer. He had recurrent hypercalcemia with evidence of locoregional recurrence and distant lung metastasis. Repeat neck surgery with lymph node dissection failed to control hypercalcemia. Hypercalcemia is currently managed with hydration and regular denosumab injections. Further genetic testing revealed a heterozygous pathogenic variant in *CDC73* gene, which causes hyperparathyroidism – jaw tumor syndrome and autosomal dominant familial hyperparathyroidism. **Conclusions:** Parathyroid cancer is rare in patients with longstanding hemodialysis and should be considered in those with refractory hyperparathyroidism. Parathyroid carcinoma in young patients warrants genetic evaluation. Therapeutic management of metastatic disease is challenging with the potential role of regular denosumab to alleviate hypercalcemia.

P54. Patterns of Lipid Profile and The Risk of Familial Hypercholesterolemia

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Background: Familial hypercholesterolemia (FH)is a frequent inherited disorder characterized by elevated levels of low-density lipoprotein (LDL) cholesterol (LDL-C) that leads to premature atherosclerosis and an increased risk of cardiovascular diseases. The study aimed to analyze the patterns of lipid profile of individuals of different age groups to assess prevalence of FH. **Methods:** Data for LDL, High-density lipoprotein (HDL), triglycerides (TG), and total cholesterol (TC) were acquired from the electronic medical records of the hospital from January to December 2020. The Dutch Lipid Clinic Network Criteria (DLCN) was used for the diagnosis of FH. Data were analyzed using SPSS v 22.0. **Results:** A total of 16,061 (males 9762 [60.8%]; females 6299 [39.2%]) tests were booked for lipid profile analyses over 12 months. Out of the total, 9818 (61.1%) of the individuals had mean LDL levels of 136 ± 31 mg/dL. The age range of the patients with hypercholesterolemia was 2–104 years. Compared to different age groups, higher LDL (>100 mg/dL), TG (>200 mg/dL), and TC (>200 mg/dL) and lower HDL (<40 mg/dL) were observed among individuals aged 41–50 years ($P < 0.001$). Based on the DLCN score, patients were categorized into definite, probable, possible, and unlikely FH groups. Of the hypercholesterolemia patients, 0.2% were diagnosed with definite FH (LDL-C > 328 mg/dL), 1% with probable FH (LDL 251–325 mg/dL), and 30% with possible FH (LDL 193–247 mg/dL). Mean LDL concentration of definite, probable, possible, and unlikely patients was 441± 124 mg/dL, 248 ± ±27 mg/dL, 165 ± 18 mg/dL, and 120 ± 13 mg/dL, respectively. About 27% of the hypercholesterolemia patients were prescribed with statins alone or a combination of statins and ezetimibe. Rosuvastatin was the most frequently prescribed drug (79%). **Conclusions:** Around 25% of the individuals presented at the hospital had hypercholesterolemia. Of these, up to 30% are possibly FH patients. Lifestyle intervention is recommended for Pakistani population with no other medical condition. Those with comorbid conditions such as cardiovascular or diabetes should be treated with lipid lowering drugs to timely prevent onset of premature cardiovascular events.

P55. Initial Diagnosis and Management of 5 Alpha Reductase Type II Deficiency Syndrome at Age 17 Years, Case Report

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Background: Infants with a congenital discrepancy between external genitalia, gonadal, and chromosomal sex are defined disorders of sex development (DSDs). Incidence of anomalies that urge assessment accounts as one per 4500 live births. **Case Report: History:** A 17-year-old phenotypically female, student, presented with absent menstruation or feminine breast development, till 11 years of age. Unfortunately, no diagnosis was built over the next 6 years. She had a partial recession of the hairline and drug-resistant acne but with well-developed suprapubic and axillary hair and voice deepening over the last 2 years. No smell abnormalities and congenital or skeletal anomalies existed. The patient was circumcised at the age of 11 years for the enlarged and hyperpigmented clitoris. Maternal exposure to androgen before or during the first trimester of pregnancy was denied. No family similar condition or consanguinity. **Examination:** Phenotypically female, the mild recession of hairline, acne, complete absence of breast development (Tanner staging: B1), normal feminine suprapubic and axillary hair (tanner staging: A5) were noted. Enlarged phallus (5 cm), palpable small gonads in the superficial part of inguinal canals, fused labia, small vaginal opening, and no associated skeletal deformities were also observed. Bodyweight = 61 kg. Height = 174 cm, span = 172 cm, body mass index = 20.2, and blood pressure = 115/70. **Laboratory:** LH was 9.79 mu/ml (average for the age) and AMH was 10.3 ng/ml (high normal for age). Total morning testosterone was 6.91 ng/ml (normal female level for age <0.7 ng/ml), androstendione was 2.96 ng/ml (female level = 0.3–3.3 ng/ml), DHT = 0.21 ng/ml (normal female level = 0.2–2.1 ng/ml), high normal LH (excluding androgen insensitivity syndrome), testosterone/androstenedione ratio = 2.33 (excluding 17Beta²-HSD3 deficiency). Testosterone/DHT ratio = 32.9 (suggesting 5 alpha reductase type 2 deficiency). DNA cloning for enzyme assay and its activity was not available. Other results were normal. Karyotyping was 46, XY. **Imaging:** pelvic ultrasonography showed two small tests in inguinal canals and nonvisualized uterus or ovaries. MRI showed ambiguous external genitalia, small blind-ended vaginal pouch, two small testes in inguinal canals, nonvisualized uterus or ovaries, suggesting androgen insensitivity syndrome. Final diagnosis was 5 alpha-reductase type-2 deficiency. **Conclusions: Management:** a multidisciplinary approach of an endocrinologist, pediatric and plastic surgeons, and psychiatrist. The patient and her family were informed by the final diagnosis, lines of treatment, and social, psychological, surgical, and financial aspects of treatment. They decided to let the patient rise as a female. Therefore, written informed consent was signed. The patient started treatment with oral estradiol valerate 2 mg twice daily following surgical removal of testes, clitoroplasty, and vaginal dilatation. Mammoplasty was delayed being done later in the plastic surgery department.

Acknowledgment

The scientific committee is grateful for all those who supported the congress by submitting abstracts. The committee would like to express its gratitude to the external abstract reviewers (Dr. Ali Al Qarni, Dr. Huda E. Mustafa, Dr. Ebaa Al-Ozairi, Dr. Thamer Alessa, Dr. Moeber Mahzari, Dr. Award Alshahrani, Dr. Mohamed Suliman, and Dr Mohammed Lamki) for their efforts in evaluating the abstracts.

Financial support and sponsorship

The GAED Annual Conference is supported by unconditional educational grants from several pharmaceutical agents. Individual abstract submissions included any relevant sponsorship information that is kept on file by the GAED.

Conflicts of interest

There are no conflicts of interest.

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