LATE BREAKING

Abstract #1100

TUMOR INDUCED OSTEOMALACIA: CLINICAL, BIOCHEMICAL AND RADIOLOGICAL FEATURES FROM A SINGLE TERTIARY CARE CENTRE WITH EMPHASIS ON FUNCTIONAL IMAGING.

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Objective: To evaluate clinical, biochemical, radiological features and optimal role of nuclear imaging in TIO.
Methods: In this retrospective and prospective study, TIO subjects evaluated from January 2002 to February 2017 at our center were considered. 68Ga-Dotanoc positron emission tomography (PET)/ computed tomography (CT) and 18fluoro-de-oxyglucose (18FDG-PET) was done for tumor localization.
Case Presentation: 27 subjects with suspected TIO were admitted. Nineteen were confirmed of TIO based on histopathological and clinical remission. Out of Nineteen subjects, 12 were in complete remission and rest had either recurrence or failed surgery. In 8 subjects tumor could not be localized and they are on medical management for hypophosphatemia. Sensitivity, specificity and positive predictive value of 68Ga-Dotanoc PET/CT were 100%, 55.6%, and 73.3% respectively. Compared to this 18FDG PET/CT has sensitivity, specificity and positive predictive value of 86.7%, 66.7% and 81.3% respectively.
Conclusion: TIO is difficult and rare disease to diagnose and localize and require high level of suspicion and systemic approach. Functional imaging (68Ga-Dotanoc PET/CT) has an important role in diagnosing these tumor.

Abstract #1101

SEVERE IMMUNODEFICIENCY AT DISEASE ONSET, AUTOIMMUNITY AND TUBERCULOSIS ARE THE BEST PREDICTORS OF SUBCLINICAL HYPOTHYROIDISM AMONG INDIANS WITH HIV INFECTION

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Objective: This study aimed to determine the prevalence and predictors of entire spectrum of thyroid dysfunction [overt hypothyroidism, subclinical hypothyroidism (ScH), subclinical hyperthyroidism, overt hyperthyroidism and sick euthyroid syndrome (SES)] in stable ambulatory patients with HIV infection.
Methods: Consecutive HIV patients, 18–70 years age, without any severe co-morbid state, having at-least 1-year follow-up at the anti-retroviral therapy clinic, having CD4 cell counts at diagnosis and at least one follow-up (6- 12 months after diagnosis) available were included in the study, who underwent clinical assessment and hormone assays. Subtle thyroid dysfunction has been reported in 35% HIV patients from Africa and USA. Hence for power of 80% and type-I error 5%, we need to evaluate >246 patients.
Results: From initially screened 527 patients, 359 patients (61.44±39.42 month disease duration), having good immune function [CD4 count>200cell/mm3: 90.25%; highly active antiretroviral therapy (HAART): 88.58%] were analyzed. 145 patients had history of tuberculosis. ScH was the commonest thyroid dysfunction (14.76%) followed by SES (5.29%) and isolated low TSH (3.1%). Anti-TPO antibody (TPOAb) was positive in 3.90%. Overt hypothyroidism and hyperthyroidism were observed in 5 (1.39%) and 2 (0.01%) patients respectively. An inverse correlation was observed between baseline CD4 count (P=0.031) and TPOAb titers, which persisted after adjusting for age and BMI (P=0.032). Similarly an inverse correlation was observed between CD4 count at present with TSH, both at baseline (P=0.043) and after adjusting for age and BMI (P=0.049). Stepwise linear regression analysis revealed TPOAb titers and CD4 cell count at time of HIV diagnosis were best predictors of ScH at baseline (Model-1), after adjusting for age and duration of HIV (Model-2), and after adjusting for model-2 plus weight and history of opportunistic fungal and viral infections (Model-3). Increased anti-TPO antibody titers and lower baseline CD4 count were independent predictors of ScH. Previous history of tuberculosis tended to be a good predictor of ScH later in life both at baseline (P=0.084), and after adjusting for variables in Model-2 (P=0.087) and Model-3 (P=0.065).
Conclusion: Burden of thyroid dysfunction in chronic HIV infection with stable immune function is lower compared to pre-HAART era. Thyroid dysfunction is primarily of non-autoimmune origin, predominantly ScH. Severe immunodeficiency at disease onset, TPOAb positivity and tuberculosis were best predictors of ScH.

Abstract #1102

A CASE OF ANTERIOR HYPOPITUITARISM AS THE INITIAL PRESENTATION OF PITUITARY METASTASIS FROM BREAST CANCER

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Case Presentation: We present a case of a 68 year old female with known stage IV breast cancer, without neurological or skull based metastasis, on trastuzumab, lapatinib and anastrozole who presented with hypotension, lethargy and nausea. Patient had a MRI of the brain with contrast that showed abnormal enhancement and enlargement of the anterior pituitary gland and infundibulum which were not seen on prior imaging. Laboratory work indicated low levels of thyroid stimulating hormone, adrenocorticotropic hormone, cortisol, sex hormones, and growth hormone indicating hypopituitarism. At the initial presentation, patient's sodium level was 136 mmol/L with no complaints of polyuria. Patient was started on steroid and thyroid hormones replacement with improvement in blood pressure and lethargy. Patient underwent a transsphenoidal biopsy and tumor resection of the pituitary lesion. Pathology was indicative of metastatic adenocarcinoma of breast origin, with no adenoma or hypophysitis reported. Following the biopsy, patient developed polyuria, hypernatremic to 150 mmol/L and was diagnosed with central diabetes insipidus. Desmopression 0.1mg orally twice a day was started and sodium level and polyuria improved. At the time of presentation, patient's prolactin level was 2.1 ng/mL. Elevated or normal prolactin levels appears to be a more common finding in the pituitary metastasis from breast cancer cases. Low prolactin level could indicate the destruction of the pituitary by the tumor cells leading to panhypopituitarism. Patient is currently undergoing fractionated stereotactic radiation treatment, and is continued on trastuzumab, lapatinib and anastrozole.
Conclusion: Pituitary metastasis has been reported in about 6-8% of breast cancer patients. Central diabetes insipidus is the most common initial presentation in metastatic lesions of the pituitary. The anterior pituitary lobe lacks a direct blood supply and metastasis usually is due to spread from the posterior lobe. As central diabetes insipidus and normal or high prolactin are a more common presentation of pituitary metastasis, the above case represents an uncommon presentation in a rare form of breast metastasis.

Abstract #1103

COMPREHENSIVE DIABETES CARE THROUGH CONTINUOUS COMMUNICATION CHANNELS TO PATIENTS WITH DIABETES

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Apollo Sugar Clinics

Objective: The purpose of this study was to assess the diet and drug adherence, quality of life (Qol), and their implications in managing hyperglycemia through condition management via telephonic calls, Apollo Sugar App, and SMS notifications.
Methods: A total of 2603 patients with diabetes were enrolled into comprehensive diabetes management program (DMP) and were counselled throughout the program with regular customized telephonic communication using a structured call calendar and questionnaire along with 24x7 app and frequent SMS notifications. Patients were assessed based on the change in their diet and drug adherence, glucose monitoring, exercise duration and family support. Descriptive statistics were applied to present the results.
Results: On analysis it was found that out of 394 patients who initially did not follow any meal plan, 53 (13.5%) patients followed small and frequent meal pattern at follow-up; of 82 patients who skipped their medication once or more than once a week, 19 (23%) patients had never skipped their medication; out of 1947 patients who were irregularly monitoring their glucose levels, 265 (13.6%) started monitoring their glucose levels regularly at follow-up. Further, 225 (8.6%) patients who did not exercise at all at baseline started exercising for at least 30 mins/day and 1 in 10 patients started receiving family support. Moreover, in a small subset of patients (n=40) we found a considerable decrease in HbA1c (8.3% to 8.0%), FBG (162 to 152mg/dL), PPG (165 to 109 mg/dL), LDL (97 to 63 mg/dL) and TC (165 to 109 mg/dL) levels.
Conclusion: The current analysis indicates that continuous monitoring and educating the patients with structured condition management may contribute to notable changes in diet and drug adherence which may further help the patients in managing diabetes effectively deriving positive clinical outcomes.

Abstract #1104

UNEXPLAINED HOARSENESS OF VOICE AFTER RADIOACTIVE IODINE THERAPY; A RARE COMPLICATION.

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Objective: Hoarseness of voice is extremely rare after radioactive iodine therapy for Graves's disease. Here we want to report a lady who developed hoarseness of voice after RAI without any other identifiable cause. This case is in addition to few rare case reports in medical literature in which RAI caused hoarseness of voice.
Case Presentation: This is a case of 29 year old lady who was diagnosed to have thyrotoxicosis 3 months post-partum. As she was lactating, thyroid scan was not done and initial diagnosis of post-partum thyroiditis was made that was also reported on ultrasound thyroid. As her symptoms continued for a longer period with no improvement, a diagnosis of Graves' disease was considered. She was then treated with neomercazole and her symptoms improved. She went into remission and her neomercazole was stopped after about 1 year. Again after about 2 years she developed same symptoms of thyrotoxicosis and was reviewed by an endocrinologist. Her labs showed TSH <0.006 and FT4 3.22nmol/l(0.89-1.76). This time Tc99 scan was done which showed diffuse increased uptake of thyroid gland consistent with the diagnosis of Graves' disease. Then she was offered the option of radioactive iodine that she opted. After receiving 15mCi of RAI she developed severe neck pain and hoarseness of voice on the next day. Initially treated with nonsteroidal anti-inflammatory drugs, her pain and sore throat resolved but hoarseness of voice continued. CBC and ESR done at that time showed normal results. For these symptoms she underwent direct laryngoscopy twice that showed no vocal cord palsy. She later on developed hypothyroidism within 2 months and was treated with thyroxine. With the passage of time her voice started to improve without any intervention and by 6 months her symptoms resolved mostly but still she complains of mild hoarseness of voice that was clinically not much evident.
Conclusion: The hoarseness of voice after radioactive iodine therapy is a rare but well reported side effect and should be known to the physicians so that they can recognize this complication and can counsel and manage the patients accordingly.

Abstract #1105

EFFECTS OF SAROGLITAZAR ON GLYCEMIC & LIPID PARAMETERS IN TYPE 2 DIABETES PATIENTS

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Objective: An observational study to evaluate the effects of Saroglitazar on glycemic & lipid parameters in type 2 Diabetes patients on oral hypoglycemic agents.
Methods: 50 Diabetic patients who are already on a stable regimen of oral hypoglycemic agents, had LDL levels □150 mg/dl and were fulfilling the inclusion & exclusion criteria were recruited in the study. Out of 50 patients 12 were on only metformin, 20 were on metformin & sulfonylurea, 7 were on metformin, sulfonylurea & DPP 4 inhibitor. 32 out of the 50 patients were also on statin therapy. The average duration of diabetes was 2 years.Their baseline glycemic & lipid parameters were measured and they were given Saroglitazar 4 mg daily for a period of 12 weeks. At the end of 12 weeks their glycemic & lipid parameters were again measured and compared with the baseline. In statistical analysis, Qyalitative data was analysed by using chi-square test and quantitative data was analysed by using paired t test.
Results: There was significant mean reduction of fasting palsma glucose (43.56 mg/dl, p<0.001), post prandial plasma glucose (69.9 mg/dl, p<0.001), HbA1c (1.1 %, p<0.001), Total Cholesterol (51.3 mg/dl, p<0.001), LDL-C (35.32 mg/dl, p<0.001), TG (124.7 mg/dl, p<0.001), NHDL-C (42.72 mg/dl, p<0.001), VLDL (15.14 mg/dl, p<0.001) and TG/HDL (3.4, p<0.001). There was non significant reduction of HDL.
Discussion: The world's first approved dual PPAR α/γ agonist, Saroglitazar was introduced in and was indicated for patients suffering from diabetic dyslipidemia. It has shown efficacy in improving both the lipid and the glycemic parameters with an excellent safety profile.There was significant mean reduction of fasting palsma glucose (43.56 mg/dl, p<0.001), post prandial plasma glucose (69.9 mg/dl), HbA1c (1.1 %), Total Cholesterol (51.3 mg/dl), LDL-C (35.32 mg/dl), TG (124.7 mg/dl), NHDL-C (42.72 mg/dl), VLDL (15.14 mg/dl) and TG/HDL (3.4). There was non significant reduction of HDL.
Conclusion: Saroglitazar, a dual PPAR α/γ agonist was proved to be a very effective drug in the treatment regimen of patients with diabetic dyslipidemia. its addition in the armamentarium of antidiabetic drugs and statins was found to have several additional benefits over the lipids and glycemic profile.

Abstract #1106

ULTRASONOGRAPHIC EVALUATION OF GALL-BLADDER VOLUME IN TYPE 2 DIABETICS AND ITS CORRELATION WITH AUTONOMIC NEUROPATHY

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Objective: Ultrasonographic determination of gallbladder volume in type 2 diabetics with 5 to 10 year duration and it's comparison with a control group and correlation of gallbladder volume in type 2 diabetics with parameters such as sex, body mass index, hyperlipidemia and autonomic neuropathy.
Methods: Fifty cases of diabetes mellitus and 50 healthy controls were recruited for the study. A detailed history was taken and physical examination was done. Laboratory investigations done were - fasting and postprandial blood sugar, glycosylated haemoglobin, and serum lipid profile. Autonomic neuropathy was determined by using simple non-invasive bedside tests. Fasting gallbladder volume was measured by ultrasonography (calculated by ellipsoid formula).
Results: The mean fasting gall bladder volume has been detected as 29.20±12.74 ml in diabetics with a minimum value of 10 and maximum value of 78 ml. and 17.50±2.206 ml in control subjects. When type 2 diabetics were subgrouped according to the presence of autonomic neuropathy, higher gallbladder volumes were seen in patients with autonomic neuropathy.
Discussion: Cholecystomegaly, to a significant degree, was documented in type 2 diabetics in the present study. It has been emphasized that duration of diabetes in these cases was 5 to 10 years. Gall bladder volume enlargement in type 2 diabetics as a whole is significantly correlated with age, BMI, total cholesterol, LDL, HDL, FBS, PPS, Hb1Ac and severity of autonomic neuropathy($p<0.001$). The mean gall bladder volume in type 2 female diabetics is higher than that found in type 2 male diabetics, but the difference in the gall bladder volume between the two sub groups is not statistically significant($p>0.05$).
Conclusion: Autonomic neuropathy is a major cause of diabetic cholecystopathy. Early screening for autonomic neuropathy can prevent the development of cholecystomegaly and subsequent development of gallstones.

Abstract #1107

POLYCYSTIC OVARY SYNDROME WITH HYPERANDROGENISM BUT WITHOUT VIRILIZATION LIKELY SECONDARY TO AROMATASE DEFICIENCY AND/OR ANDROGEN RECEPTOR SIGNALING DYSFUNCTION.

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Case Presentation: A 61-year female was evaluated in endocrinology office for elevated testosterone without virilization. She had Polycystic Ovary Syndrome(PCOS) diagnosed at the age of 18 when she had oligomenorrhea and elevated testosterone. She used birth control pills until third decades and menstrual cycle regularized at the age of 42 through 57. She had menopause at the age of 57 without vasomotor symptoms. Total testosterone remained elevated ranging between 250-280 ng/dl until menopause. She had genotype 46XX, remained unmarried without children. Except for occasional acne, she never had clinical features of high testosterone. Family history was Type 2 diabetes mellitus and some hirsutism in her mother. She was average built, feminine, female hair distribution, no hirsutism and not muscular. Postmenopausally total testosterone further increased to 440 ng/dl (reference range 2-45) with Free Testosterone 52 pg/ml(reference range 0.1 - 6.4), testosterone bioavailability 49.4 ng/dl (reference range 0.5-8.5). She had FSH/LH elevation, estradiol appropriate for menopause and normal SHBG, 5-alpha DHT, 17-hydroxyprogestosterone, 17-OH-pregnenolone and DHEA. MRI abdomen and pelvis showed enlarged ovaries but no adrenal masses. Transvaginal Ultrasound showed moderately enlarged and symmetric ovaries. Osteopenia on DEXA scan, Hemoglobin of 13g/dl, high insulin sensitivity, HDL-C of 70mg/dl indicated that she had no effects of high testosterone. MRI brain showed 14mm lesion and microadenoma in pituitary gland. She was advised for Oophorectomy however she remained hesitant due to possible postoperative effects.
Discussion: Our patient had menstrual irregularity, enlarged ovaries and hyperandrogenism but no effects of high testosterone which goes along with Androgen receptor signaling dysfunction. Aromatase deficiency explains low estrogen and increased LH which further increased the testosterone. There was Increased Testosterone to override likely aromatase dysfunction and produce enough estrogen to regulate enough FSH/LH from age 42 to 57 for regular menstrual cycles. Dysregulation of estrogen and increased LH leaded to ovarian interstitial hyperplasia. Presumptive effect of lifelong hyperstimulation of ovarian interstitial

cells by LH/FSH to maintain adequate estrogen likely leaded to pituitary hyperplasia. We are yet to follow with genetic testing for androgen receptor and aromatase enzyme.
Conclusion: Hyperandrogenism in PCOS may not manifest as virilization and metabolic effects. This can be explained by possible aromatase deficiency and/or Androgen receptor signaling dysfunction. Patient should be followed and treated accordingly if any of clinical features manifested.

Abstract #1108

IATROGENIC INADVERTENT INSULIN DETEMIR 1,000 UNITS OVERDOSE IN HOSPITALISED PATIENT.

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Case Presentation: A 69 year old female admitted in the hospital for sepsis secondary to urinary tract infection. She had comorbidities of diastolic heart failure, End Stage Renal Disease on Hemodialysis, Chronic Atrial Fibrillation, Uncontrolled Type 2 Diabetes Mellitus, insulin resistant morbid obesity and Obstructive sleep apnea. On hospital day 15, she was given 10ml of Insulin Detemir inadvertently by nurse in the morning which was equal to 1,000 units of Detemir instead of her scheduled dose of Insulin Detemir 125 units which she received twice a day in addition to her insulin aspart 8 units 3 times a day plus additional correction scale. The overdose event was known immediately. She was given continuous infusion of dextrose 5% for first two hours and then dextrose 10% with potassium supplement. Hydrocortisone 75mg was given intravenously every 6 hours for 24 hours. Blood sugar was 415mg/dl at the time of insulin overdose, remained in 200s mg/dl in the first few hours, dropped to 142mg/dl in 5 hours and then remained in 250 to 300mg/dl in most of the times until the blood sugar was 413mg/dl after 24 hours from the time of overdose. Insulin level was 721mIU/ml (reference range 2-19.6) in 12 hours and 325.5mIU/ml in 18 hours from time of overdose. After 24 hours of overdose, Dextrose and hydorcortisone were stopped and insulin Detemir 125 units 2 times a day and insulin aspart 8 units 3 times a day with additional correction scale were restarted. Patient was monitored for 48 hours in the hospital and blood sugar remained in 350-380mg/dl. Finally patient was discharged to sub-acute rehabilitation facility.
Discussion: Insulin Detemir is long acting form of insulin dosed once daily or twice daily and intended to maintain constant baseline insulin level. Insulin detemir has onset of action in 3-4 hours, peak effect in 3-9 hours and duration of action for 6-23 hours which depends upon dose. On a PubMed search, we noted multiple case reports of intentional large insulin overdoses for suicidal attempts, the largest of which were glargine 3,800 units, detemir 2,100 units and NPH 2,500 units. There was no reported case of iatrogenic insulin overdose in PubMed search. In our patient insulin overdose happended due to mistake by medical staff. This happened due to confusion of injecting insulin using vial and pen and ended up giving 10ml insulin using 5cc syringe.
Conclusion: Insulin overdose can happen in hospitalized patient. Medical staffs should have through knowledge of injection methods and concentration of insulin. Once overdose happened, there should be low threshold to start continuous infusion of dextrose and close monitoring of blood sugar and electrolytes.

Abstract #1109

ONE YEAR OBSERVATIONAL STUDY OF SAROGLITAZAR IN COMBINATION WITH STATIN IN DIABETIC DYSLIPIDEMIA

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Objective: To evaluate the safety and efficacy of saroglitazar in combination with statin in patients with diabetes dyslipidemia.
Methods: This was an observational, postmarketing surveillance of saroglitazar. The patients included in this analysis were suffering from type 2 diabetes and dyslipidemia. All patients were on on-going antidiabetic medication and statin therapy at baseline. Saroglitazar 4 mg once daily was prescribed according to the prescribing information. The safety (adverse drug reaction) and efficacy (lipid and glycemic parameters) were evaluated at regular follow-ups and at one year follow-up.
Results: A total 796 patients with a mean duration of diabetes 7.24±5.85 years were included in this analysis. The mean age of study participants was 53 ± 10 years and mean BMI was 27.5 ± 4.01 kg/m2. 62.4% of the total patients were males. All patients were on statin therapy at baseline (68.8% on atorvastatin, 29.3% on rosuvastatin and 1.9% on pitavastatin). At 1 year follow-up, triglyceride was significantly reduced from 316.2 ± 136.29 mg/dL to 127.4

± 40.35 mg/dL (p<0.0001). The baseline non –HDL-C value was 212.2 ± 63.59 mg/dL and reduced to 116.9 ± 31.98 mg/dL at 1 year follow-up (p<0.0001). Other lipid parameters like LDL-C, total cholesterol and VLDL-C were also reduced significantly by 31.9%, 24.4% and 51.6% respectively at 1 year follow-up. At baseline, 0.39% patients were having triglycerides <150 mg/dL; after 1 year treatment with saroglitazar, 78.41% patients achieved triglycerides <150 mg/dL. No serious adverse event reported during 1 year treatment with saroglitazar in combination with statin. Saroglitazar was found to be well tolerated.

Discussion: Saroglitazar is a dual PPAR α/γ agonist, with predominant action on PPAR α receptor. It is currently approved in India for the treatment of diabetic dyslipidemia. Statin is the primary treatment recommended for diabetic dyslipidemia. Significant residual cardiovascular risk after optimal statin therapy is still a concern. Recent observational studies have established the positive association between high triglycerides levels and increased risk of cardiovascular events. Saroglitazar, when added to on-going statin therapy in patients with diabetic dyslipidemia, significantly reduces triglycerides and non HDL-C levels. It is safe and well tolerated.

Conclusion: One year treatment with saroglitazar in combination with statin is safe and effective in patients with diabetic dyslipidemia. Saroglitazar treatment helps in achieving triglycerides targets in more number of patients.

Abstract #1110

HYDROXYCHLOROQUINE IN TYPE 2 DIABETES WITH ADHESIVE CAPSULITIS

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Objective: To evaluate the efficacy of Hydroxychloroquine as both an antidiabetic drug as well as resolution of adhesive capsulitis in Type 2 diabetes patients who are currently uncontrolled with dual oral Antidiabetic drugs.

Methods: Total 39 consecutive patients of Type 2 diabetes mellitus with shoulder adhesive capsulitis were included for the current study, who were inadequate blood glucose control (HbA1c 7.5 to 10%) and who were already on two oral antidiabetic drugs. Hydroxychloroquine 400 mg once a day was added as an adjuvant therapy for 12 weeks for glycemic control and its impact on resolution of shoulder adhesive capsulitis was accessed at regular follow ups. Subjects with proliferative retinopathy were excluded from the study. Efficacy was assessed by FBG, PPBG and HbA1c reduction while resolution of adhesive capsulitis was evaluated by resolution of symptoms, needs for additional pharmacotherapy or any surgery.

Results: All the 39 Type 2 diabetes Mellitus patients on two oral agents (metformin along with either a secretagouge or a DPP4 inhibitor). The mean age of patients was 56 years and 23 were males and 16 were females. The Average BMI was 28 kg/m2. The mean HbA1c was 8.9 %, which reduced to 8.1 % at the end of 12 weeks. The mean FBG was 162 mg/dl, which was reduced to 124 mg/dl while the mean PPBG was 219mg/dl which reduced to 169 mg/dl at the end of 12 weeks.

37 patients showed complete resolution of symptoms of shoulder adhesive capsulitis. 2 patients needed additional pharmacotherapy while no patients needed corticosteroids or surgery.

Conclusion: Hydroxychloroquine 400 mg once a day is an effective add-on for getting dual benefits of glycemic control and resolution of shoulder adhesive capsulitis, when appropriately used in type 2 diabetes mellitus patients with adhesive capsulitis, poorly controlled on dual oral agents.

Abstract #1111

DYSLIPIDEMIA PHENOTYPE IN INDIAN DIABETES PATIENTS

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Apollo Sugar Clinics

Objective: Abnormal lipid levels are considered to be a significant risk factor for atherosclerotic cardiovascular disease, and this risk was found to increase considerably in diabetes patients. Thus, the study purpose was to evaluate the lipid profiles of type 2 diabetes (T2D) patients registered at Apollo Sugar clinics-PAN India.

Methods: This study was a retrospective analysis of 3368 T2D patients who visited (Jan 2015 to Jan 2017) Apollo Sugar Clinics, across India. Patients' demographics and lipids data were collected from electronic medical records for analysis. Appropriate statistics were applied to identify the significant association of abnormal lipid profile with diabetes. Statistical analysis was done using SPSS version 20, and a 2-tailed $p \leq 0.05$ was set to be significant.

Results: Total 3368 T2D patients were included in the analysis, had a mean age of 52.0 (11.4) years, males and

females were 63.2% and 36.8%, respectively. Among these patients 68.7% have high LDL (>100 mg/dL), 80.6% have low HDL (<50 mg/dL), 43.2% have hypercholesterolemia (>180 mg/dL) and 78.2% have hypertriglyceridemia (>100 mg/dL). However, in total patients, 31.3% and 56.8% were at LDL and TC targets, respectively. Further, in low HDL group of 80.6%, majority of the patients had high LDL (67.9%) and high TG (79.7%). The mean concentrations of LDL, HDL, and TC were significantly higher in females compared to males ($p \leq 0.001$) suggesting females were more dyslipidemic than males.

Conclusion: The prevalence of dyslipidemia was observed to be high in diabetes patients than reported in general population. The pattern of dyslipidemia is different in India which is termed as 'atherogenic dyslipidemia' where, in addition to low HDL, there were elevated levels of both LDL and TG. This increases enormous burden of non-communicable disease and needs multifactorial intervention for primary prevention of cardiovascular disease in diabetes.

Abstract #1112

CLINICAL EVALUATION OF T2D PATIENTS FOR CARDIOVASCULAR RISK THROUGH MILLION HEART ASCVD RISK ASSESSMENT TOOL

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Apollo Sugar Clinics

Objective: The study aimed to minimize the risk posing factors and evaluate new CVD risk score using Million Hearts® Longitudinal ASCVD risk assessment tool among Type 2 Diabetes Mellitus (T2D) patients.

Methods: It is a retrospective analysis of 365 T2D patients' records, the data was obtained from EMR of Apollo Sugar Clinics, India. Patients were categorized into normotensive (<120-129/80, mmHg), prehypertensive (130-139/80-89, mmHg), and hypertensive (>140/90, mmHg) based on their blood pressure (BP). CVD risk score was calculated using Million Hearts® Longitudinal ASCVD Risk Assessment Tool, as per ACC/AHA 2016 guidelines. Statistical analysis was done by using SPSS version 20, with significance set at $p \leq 0.05$.

Results: Of total 365, 45.8%, 24.4%, and 29.9% were normotensive, prehypertensive, and hypertensive, respectively. Mean (SD) age was 52.6 (11.9) years, males and females were 63.6% and 36.4%, respectively. Mean age, BMI, and total cholesterol (each $p < 0.05$), strong indicators of CV risk were significantly different among three groups. In 161 patients who met the ASCVD Risk Assessment criteria, the 10-year baseline risk was 16.8% and expected risk (if statin therapy initiated) was 12.5%. Significant difference in CV risk score was observed among three groups at baseline (14.4%; 15.6%; 19.4% p=0.05), and expected 10-year risk (10.8%; 11.6%; 14.4%) if statin therapy initiated.

Conclusion: Lowering cholesterol to recommended targets by moderate or high intensity statin should be an important component of multifactorial intervention for primary prevention of CV disease in diabetes patients.

Abstract #1113

DIAGNOSIS OF FAMILIAL HYPOCALCIURIC HYPERCALCEMIA: HOW RELIABLE IS CALCIUM CREATININE CLEARANCE RATIO?

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Objective: Some have suggested that a calcium creatinine clearance ratio (CCCR) of <0.010 implicates familial hypocalciuric hypercalcemia (FHH), a CCCR of >0.020 is highly suspicious of primary hyperparathyroidism (PHPT) and the values in between is considered a gray zone. The objective of this report is to highlight the pitfall of relying on a single CCCR value <0.010, as the sole basis for the diagnosis of FHH.

Methods: Case report: A 39-year old woman was evaluated for hypercalcemia with elevated PTH, she was hypocalciuric with a CCCR <0.010 with normal Ca and vitamin D status, and FHH was diagnosed. Subsequent testing over a 9-year period showed a progressive increase in urine Ca and CCCR, and a sustained rise in PTH, with a clinical diagnosis of PHPT plus or minus FHH. CASR mutation analysis was negative, further genetic testing is pending.

Case Presentation: A 48-year old woman presented for reevaluation of FHH. She was diagnosed as such 9 years earlier based on serum Ca of 10.3 mg/dl, PTH 104 pg/ml, 25(OH)Vit D 39 ng/ml, 24-hr urine Ca 130 mg/24hr with CCCR 0.007. Five yrs later - Ca was 11.1 mg/dl, PTH 128.7 pg/ml, 25(OH)Vit D 30 ng/ml, 24-hr urine Ca 192.5 mg/24hr, CCCR – N/A. Latest presentation, 9 yrs - Ca 11.3 mg/dl, PTH 214 pg/ml, 25(OH)Vit D 28 ng/ml, 24-hr urine Ca 216 mg/24hr. Her mild vitamin D insufficiency was treated; repeat Ca 11.3 mg/dl, PTH 214 pg/ml, 25(OH)Vit D 39 ng/ml, 24-hr urine calcium 216 mg/24hr, CCCR 0.01. Family history was unknown. She underwent cholecystectomy for gallstones. One-month follow-up - Ca 11.1 mg/dl, PTH 217 pg/ml, 25(OH)Vit D 41 ng/ml, 24-hr urine calcium 275 mg/24hr, CCCR 0.015.

Renal function - normal. DXA scan - normal. Two months later - Ca 10.5 mg/dl, PTH 226.9 pg/ml, 25(OH)Vit D 40 ng/ml, 24-hr urine Ca 278 mg/24hr, CCCR 0.014. CASR mutation analysis was negative, GNA11 and AP2S1 screening is being awaited.

Discussion: The patient's initial CCCR was not in the diagnostic gray zone. A simple diagnosis of FHH could not be sustained 9 years later. Rarely some FHH patients are hypercalciuric, though it should have obvious during her initial presentation. It is unclear if her cholelithiasis, reported in some patients, was related to FHH. Negative genetic screening for CASR, GNA11 and AP2S1 mutations would not absolutely exclude FHH. Both her PTH level and urine Ca continued to rise, in consistence with PHPT. Some FHH patients develop PHPT, so coexistence of both disorders in this patient is plausible.

Conclusion: A single CCCR determination, is not reliable in distinguishing FHH from PHPT, as the values may fluctuate or increase significantly with time. A combination of clinical suspicion, biochemical evaluation and genetic testing is required to differentiate them.

Abstract #1114

TWENTY YEARS FOLLOW UP FOR OFFSPRING OUTCOMES IN TWENTY TYPE 1 DIABETIC PATIENTS WITH PREGNANCY

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Objective: Education along with the socioeconomic determinants in Type 1 diabetes women are important for pre-pregnancy planning. We retrospectively accessed the outcomes of pregnancy in patients in a cluster of T1DM in Northern India.

Methods: We retrospectively analysed the maternal and the offspring outcomes in 20 type 1 diabetic patients who were provided the pre-pregnancy counselling at the Centre for Diabetes and Endocrine in urban setting in North India.

Results: The participants (n=20) were on continuous basal bolus regimen with mean age of conception of 29.2 years (22 to 35 yrs) with the average duration of diabetes of 19.5 years (5 to 44 yrs). Half of the pregnancy were unplanned. All of them had conceived naturally except one who underwent IVF treatment because of polycystic ovarian disease. Analysis of maternal outcomes revealed that only 10 T1DM were evaluated for prenatal HbA1c. Frequency of blood sugar monitoring was mean 2 pricks / day (1/7 days- 6 times /day). Average weight gain during pregnancy was 3.2 kg (3.4 to 10 kg). 18 deliveries were by the elective caesarean section at mean 32 weeks (28-40 weeks) of gestation. Offspring follow up reveal, the average birth weight was 2.6 kg (1 to 3.75 kg). Only one baby was < 5th percentile for weight and two were >90th percentile for weight. Eleven of them had stay in ICU with mean of 7.2 days (1-125 days) mainly for hypoglycaemia except for two, who had hyperbilirubinemia. Appropriate focus for age at marriage, age at conception were analysed for the association of the pre-natal, inter natal and post-natal maternal outcome and offspring outcome parameters like birth weight, hospital stay.

Discussion: Since 50% pregnancies were unexplained, more, emphasis is required on education. The most common mode of delivery was caesarean section, which could be perhaps due to the over cautious approach by the gynaecologists. We propose a EGP (Education-Gynaecologist-Physician) model to achieve an improved offspring and peri-natal outcome, encompassing a holistic multi -pronged approach with the better education of the patients, greater awareness and involvement of the gynaecologist, with the greater role played by the physician is important to maintain a good metabolic control.

Conclusion: Despite of delay in marriage and late age at conception, decrease frequency of HbA1c and SMBG, the offspring outcome was satisfactory.

Abstract #1115

RESISTANT HYPOTHYROIDISM DUE TO LIVER HEMANGIOMA

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Objective: Hashimoto's thyroiditis is the most common cause of hypothyroidism accounting for >90% cases of hypothyroidism. We present a case of Hashimoto's thyroiditis unresponsive to levothyroxine therapy due to presence of deiodinase producing liver hemangioma.

Case Presentation: Our patient is a 41 year old caucasian female, who was referred to endocrinology clinic for persistent hypothyroidism despite high doses levothyroxine therapy. On presentation, she complained of fatigue, headache & constipation and was found to have TSH 14.59 uIU/M (N 0.3-5.0 uIU/M) despite being on levothyroxine 200 mcg per day. Previous records revealed positive titre for TPO antibody and TG antibody. Repeat TSH every 4-6 weeks showed persistently elevated TSH despite stepwise increments in dose of levothyroxine from 200 to 500 mcg/ day. TSH remained 11.59 uIU/M despite being on LT4 500 mcg for 4-6 weeks and her symptoms remained unchanged. Medication compliance and

technique of taking the medication was reviewed on every visit to the clinic. Patient's poor response to high dose LT4 therapy prompted work up for secondary causes for hypothyroidism. US thyroid showed normal thyroid gland. Celiac disease work up showed negative titres for IgA tissue transglutaminase and IgA endomysial antibodies. Upper GI endoscopy with biopsy showed normal mucosa without any evidence of celiac disease. A CT abdomen & pelvis with contrast showed left subcapsular 4.5 X8.3 mm non enhancing nodule which was confirmed with MRI abdomen with & without contrast showing arterial hypervascularity and intrahepatic vascular shunt. Patient was finally euthyroid (TSH to 4.33 uIU/M) on daily dose of 5 mcg of liothyronine and 500 mcg of Levothyroxine.

Discussion: Although mostly diagnosed in pediatric cases, a few cases of consumptive hypothyroidism associated with hepatic hemangioma has also been reported in adults. Our patient remained unresponsive despite requiring approximately 5 times the normal dose of LT4, which could be explained by increased activity of type 3 deiodinase enzyme. Deiodinases are group of thioredoxin fold-containing selenoproteins which controls the action of thyroid hormones. Excessive production of type 3 deiodinase enzyme, from hemangioma leads to conversion of T4 to reverse T3 and T3 to T2 which are inactive forms of thyroid hormone. The patient required supplementation of LT3 in addition to LT4 to achieve biochemical and symptomatic improvement.

Conclusion: The common causes of poor response to LT4 are inadequate doses, poor technique, compliance or non adherence, it is always important to identify the rare causes of treatment failure.

Abstract #1116

PERSISTENT HYPERTHYROIDISM SECONDARY TO GRAVES' DISEASE FOLLOWING PARATHYROIDECTOMY

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Objective: Transient hyperthyroidism is not an uncommon finding following parathyroidectomy but develops within two weeks and resolves within 90 days of diagnosis. We present a case of persistent hyperthyroidism secondary to graves's disease following parathyroidectomy for primary hyperparathyroidism.

Case Presentation: A 41-year old Southeast Asian female who was found to have primary hyperparathyroidism during work up for multiple episodes of renal colic. She eventually underwent right inferior parathyroidectomy and the pathology results confirmed the diagnosis of parathyroid adenoma. Preoperative screening tests revealed normal thyroid function with TSH 2.62 mIU/L (04-4.5 mIU/L). 3 weeks post operatively, patient developed intermittent palpitations, tremor and shortness of breath. She also complained of anxiety and was tachycardic at 119 beats/minute. Physical examination showed normal thyroid gland without any nodules. Laboratory workup revealed undetectable TSH 0.0 mIU/L (04-4.5 mIU/L) with elevated Free T4 10.43 ng/dl (0.7-1.9 ng/ml) and elevated Free T3 5.0 pg/mL (2.3-4.2 ng/ml) confirming overt hyperthyroidism. Additional work up showed high thyroid stimulating immunoglobulin (TSI) 257, high Thyroglobulin Ab (TgAb) 185 units/ml (<60 IU/ml) and normal thyroid peroxidase Ab (TPO) 36 units/ml (<60 units/ml). She was started on methimazole 10 mg daily and metoprolol XL 50 mg daily on which her symptoms improved. On follow up, her lab works showed TSH <0.01 mIU/L with Free T4 0.61 ng/dl and Free T3 5.0 pg/mL at 1 month and TSH <0.01mIU/L with Free T4 0.97 ng/dl and Free T3 5.6 pg/mL at 3 months. At 6 months, patient continues to be on the methimazole 10 mg and metoprolol XL 50 mg daliy and is clinically euthyroid.

Discussion: Transient hyperthyroidism occurs in 30% of post-parathyroidectomy patients with primary hyperparathyroidism due to thyroid manipulation and stress. It occurs within days of surgery, is usually clinically mild or silent, and typically spontaneously resolves within 2 weeks without any medical treatment. Our patient spontaneously developed graves' disease 3 weeks post parathyroidectomy leading to persistent hyperthyroidism with no known apparent thyroid abnormality before or during surgery. Occurrence of graves' disease following parathyroidectomy raises the possibility of release of thyroid autoantigen during surgery, triggering autoimmune activation.

Conclusion: Post parathyroidectomy transient thyrotoxicosis should be thoroughly evaluated and followed to prevent underdiagnosis of persistent hyperthyroidism and graves' disease.

Abstract #1117

MICRODISSECTION EXTRACTED NUCLEIC ACID MOLECULAR/CLASSIFIER TESTING OF 3 YEAR ORIGINAL THYROID BIOPSY SLIDES SAVED A REPEAT BIOPSY: A CASE

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Objective: It is common for a thyroid biopsy to be done without collecting washout material for molecular markers. When the cytopathololgy is Class 111,in the past a repeat FNA is needed. The use of microdissection of the original

biopsy slides can replace the need for a second biopsy. We describe a case where 3 year old biopsy slides were microdissected for molecular markers and classifier to make the diagnosis of a KRAS driven follicular neoplasm.
Methods: 73 Y/O female with long history of Hashimoto's thyroiditis presented with enlarging goiter, marked elevated thyroglobulin of 1330 ng/ml (Dr.Carole Spencer USC thyroid lab LosAngeles) and 2 right lobe nodules that were biopsied 3 year prior.They were both class 111 indeterminate. No molecular marker testing was done or collected at that time. Because there was an original biopsy diagnosis that we confirmed was Class 111 we determined to defer the repeat biopsy and send the original slides for testing.
The original thyroid biopsy slides from 3 years prior to the consultation was submitted for microdissection for markers ThyGen X and classifier ThyraMIR to Interpace Diagnostics Pittsburgh Pa.
Case Presentation: The results of the microdissection testing was the presence of KRAS mutations in both of the right thyroid nodules.The classifier studies on the 2 biopsies were negative. She was told that the enlarging goiter nodules, the prior indeterminate biopses from 3 years prior and the new finding of extracted nucleic acid from cytology slides from an old biopsy found a KRAS driven tumor in the right lobe. She was advised to have a right lobectomy. Surgery results pending.
Discussion: The availability of microdissected material from all types of thyroid biopsy slides even years later can be a great help in patients who arrive for second opinion with indeterminate biopsy results and need a repeat biopsy to obtain marker and classifiers.Another test called REVEAL by genomic lab(Rosetta GX Lake forrest Ca) does microdissection Thyroid microRNA classifier.. However, some biopsy material presently is liquid based and is not suitable to microdissection.
Conclusion: The availability of microdissection of thyroid biopsy slides for molecular markers and classifier has allowed patients that did not have washout material collected during the nodule biopsy to be studied after the cytology diagnosis indicates the need for marker testing. This procedure takes the place of another costly biopsy with it's anxiety, pain and expense in patients with slide material to study.

Abstract #1118

PERTHE'S DISEASE WITH SPORADIC DYSCHONDROMATOSIS UNIVERSALIS HEREDETARIS: A CURIOUS CASE OF SEVERE SHORT STATURE

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Objective: To describe for the first time possible case of IGF-1 resistense in Perthe's disease and endocrine abnormalities of DUH.
Case Presentation: 7 year old girl with generalized reticular hyperpigmentation (appeared first on hands), short stature, painful limp (right sided), non scarring alopecia. Antenatal period uneventful, FTND (Birth weight= 2.9 kg), normal milestones. No H/O hospitalization,short stature or consanguinity. Ht= 86 cm (-5.8 SDS), coxa vara, rt leg shorter, reticulate asymmetrical hyperpigmentation,non cicatrial alopecia (more on rt side), Tanner staging G1P1 ,U/L ratio=1.2/1.No organomegaly. Calcium 8.6 Phosphorus 4.3, iPTH :61 pg/ml ,25(OH) Vitamin D 23 ng/ml, Alkaline phosphatase 280 U/L, IGF-1 710 ng/ml(+2 to +3 SDS), IGHBP3 =3456 ng/ml (+2 SDS)GH 1 hr after 50 g of glucose <1 ng/ml ,9 am cortisol: 11 mcg/dl .Pooled LH /FSH/ estradiol : <1/<1/<10 pg/ml TSH/Free T4 =2.3U/L , 0.9ng/dl. MRI B/L Hip with femur; Small mildly flattened right femoral head, ossific nucleas with contour irregularity, dark signal non pulse sequences s/o Perthes Disease rt side.
Discussion: Leg-Calve-Perthes disease has prevalance of 1 in million. The pathophysiology is not known but is postulated to result from mechanism which control differential growth of different part of body. GH/IGF-1 axis both local at the level of growth plate as well systemic level is thus mechanistically involved.In LCP, IGF-1 levels have been various described from being on high to normal to low In rat models differential expression of IGF-1/IGHF2 transcripts lead to LCP like pathology. However, majority of subjects with LCP have short stature to the tune of -1 to -3 SDS. Our patient had severe short stature(-5.8 SDS) and higher IGF-1/IGHFBP3 levels suggesting IGF-1 resistense or decreased IGF-1/IGFBP3/ALS clearance. IGF-1 insensitivity has been shown in pygmies ,where it does not interfere with life expectancy/metabolism. The peculiar age, hyperpigmentation, Café-au-lait spot, increased IGF-1, bone abnormality made it imperative to r/o MaCune Albright syndrome .GH suppression test showed 1 hr GH <1ng/ml. A very peculiar feature of this case is presense of asymmetrical reticulate hyperpigmentation resembling dyschromatosis universalis herediatria (DUH). DUH is extremely rare skin disease described mostly in Japan, but also in southern India.

Few cases have systemic manifestation of short staure and coxa-vara. No endocrine abnormalities have been described in DUH.
Conclusion: We describe severe short stature likely due to IGF-1 resistense in case Of LCP. We also describe for the first time skin lesion in Leg-Calve-Perthes disease in form of sporadic Dyschromatosis Universalis Herediatria, an extremely rare skin disorder.

Abstract #1119

ACADEMIC CHALLENGES FACED BY CHILDREN WITH TYPE 1 DIABETES MELLITUS IN ASIA - THE PROBLEM AND SOLUTION.

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Objective: A comprehensive understanding of the social and psychological impact of diabetes is important for informed policy and practice. Patients with Type 1 diabetes (T1D) report being stigmatized at various stages of life, begining from school, to workplace, relationships etc. This has negative impact on their psycho-social well-being, thereby contributing to poor clinical outcomes.
This study was undertaken after parents of children with T1D at Delhi Diabetes Research Center(DDRC) reported declining academic performance. We proposed hypoglycemia during examination as the main contributing factor.
Methods: We conducted an observational study involving 12 children with T1D. There were 7 girls and 5 boys in the age group of 13-17 yrs. We studied self reported outcomes of performance and hypoglycemia during exams.
The concerned teachers were counselled about the symtoms of hypoglycemia and instructed to allow children to carry Glucose Tablets(GT) with them during exams. Following this, a children's questionnaire was conducted, as below:
Did you need to take GT and did symptoms improve ?
Were you able to perform better in the examination time?
Do you feel more confident in facing exams with above provision ?
Results: 6 children reported hypoglycemia which was verified by fingerstick glucose test. 4 reported hypoglycemic symptoms only but no glucose testing was done. All of 10 children reported symptomatic improvement after eating GT. 2 did not report any sugar problem during exam.
All children reported improvement in confidence and self reported exam performance after implementation of above program.
Discussion: Our study suggests a lack of awarenss in schools about T1D or hypoglycemia prevails. Increasing awareness can lead to appropriate measures being taken during hypoglycemia episodes. These measures will help children achieve their true potentials and reassure their parents.
Conclusion: Frequent hypoglycemic episodes can affect academic performance and reduce confidence of children. Based on our observations, the Central Board of Secondary Examination (CBSE) of India has now permitted children with T1D to carry glucose tablets/snacks/water with them at all times during examinations.They have also agreed to our draft for Medical certificate which will be submitted by their physician to school and board of examinations.
This decision is going to have a positive impact on their performance and at the same time will help in reducing the apprehensions of the parents. We suggest that apex bodies like AACE also issue guidelines based on our observations so that all children with T1D in the world can avail these benefits.

Abstract #1120

TEMPORAL PROFILE OF ASSOCIATION BETWEEN DIABETES AND OBESITY IN URBAN INDIA

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Objective: To capture the profile of people with diabetes and analyze temporal trends in age at diabetes onset and in association of diabetes with obesity in Urban India.
Methods: Retrospective data of all unique patients with diabetes was captured from clinic EMR (electronic medical records) from May 2015 to March 2017 period and was analyzed. Further, subset analysis of people with new onset diabetes was done.
Results: Data of total 1473 patients was retrieved. Mean age of patients was 52.64±12.66 years with mean body mass index (BMI) of 27.86±4.83 kg/m2. Females had significantly higher mean BMI than males (29.19±4.99 vs. 26.93±4.83; p = <0.001). Overall, mean HbA1c of patients was 7.84±1.61% with no significant difference between genders. BMI cutoff for overweight was kept at 23 kg/m2 as per accepted norms. Overall, 86% of all people with diabetes had BMI ≥ 23 kg/m2. Significantly higher proportions of females with diabetes had prevalence of overweight/obesity as compared to males (91.8% vs. 82%; p = <0.0001). However there was no difference in mean HbA1c based on either gender or BMI category.
In comparison to overall data, data of people with new-onset diabetes (n = 178) was even more startling with even higher proportion of people with BMI ≥23 (Overall 89.1%, Males 87.6%, Females 91.6%) and 43.8% of people presented at <40 years age. 49.5% of males presented at age less than 40 years as compared to 33.9% of females.

Discussion: Association between diabetes and obesity has always been known to vary as per different ethnicities. India has high prevalence of diabetes despite having low prevalence of obesity. Temporal trends for any change in this phenomenon have not been reported so far. In a National survey of diabetes in urban areas in India, In year 2001, mean BMI of People with diabetes was 24.4kg/m2 in males and 25.7kg/m2 in females and 46.8% of subjects with diabetes had BMI >25kg/m2. In current dataset, 55.6% of people with new onset diabetes had BMI >25kg/m2 and 89.1% had BMI >23 kg/m2. Mean BMI in both males and female has also gone with time. Only 25.1% of people presented before 40 years of age in same survey and corresponding number in our data is 43.8%.
Conclusion: Prevalence of obesity among people with diabetes in Indian setting is now as high as in western studies. Indians are now presenting with diabetes at even earlier age with higher BMI.

Abstract #1121

A NEXT-GENERATION GENE EXPRESSION CLASSIFIER FOR CYTOLOGICALLY INDETERMINATE THYROID NODULES DERIVED FROM A NOVEL SEQUENCING PLATFORM AND MACHINE LEARNING ALGORITHMS WITH IMPROVED CLINICAL SPECIFICITY: INTERIM ANALYSIS

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Objective: We adopted an RNA based next-generation sequencing (NGS) assay to combine expressed transcripts, variants, fusions and other genomic features to interrogate the breadth of carcinoma subtypes in cytologically indeterminate (cyto I) nodules. We evaluated a variety of machine learning models using these enhanced genomic features to construct classification algorithms to improve the specificity of diagnosing benign nodules while maintaining high sensitivity to detect malignancy and Non-Invasive Follicular Thyroid neoplasm with Papillary-like nuclear features (NIFT-P).
Methods: Fine needle aspiration (FNA) specimens were collected preoperatively from 706 nodules and used in training. 371 nodules underwent surgery and the aspirated lesion was diagnosed by a blinded panel of histopathology experts, resulting in 162 benign, 194 malignant, and 15 NIFT-P nodules. An additional 68 clinically benign nodules were included based on GEC benign results and clinical follow-up (mean 23 months, range 17-32) with no American Thyroid Association high suspicion ultrasound (US) pattern and either a stable US size or repeat FNA with benign cytology during follow-up. RNA was isolated from all FNAs and analyzed using an automated RNA-seq assay.
Results: Models were built from a combination of features, including differentially expressed genes, variants, fusions, mitochondrial genes, and loss of heterozygosity. The best model uses a GLMnet classifier with a follicular cell adequacy filter and Hürthle, BRAF V600E, and MTC cassettes. Cross-validation of 258 cyto I samples with histopathology yielded 91.3% sensitivity and 73.5% specificity (vs. 90.2% and 51.6%, respectively, previously reported for the current GEC). There was 100% sensitivity for categorizing NIFT-P as suspicious.
Discussion: The findings with this enhanced test predict that both 1) a greater proportion of patients with benign nodules will be identified and potentially spared unnecessary surgery, and 2) a greater proportion of operated patients will prove to have malignancies/NIFT-P.
Conclusion: Classifiers with sustained high sensitivity and improved specificity were developed using an NGS platform. Efforts are underway to apply these methods to an independent prospectively collected cohort of cytologically indeterminate nodules.

Abstract #1122

DIAGNOSIS AND TREATMENT OF SECONDARY ADRENAL INSUFFIENCY BEFORE THYROXINE REPLACEMENT IN PATIENTS WITH PITUITARY APOPLEXY

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Objective: Secondary adrenal insufficiency and hypothyroidism can coexist and share similar clinical picture.
Case Presentation: An 81-year old male presented to

the ER for complaints of passing out and generalized weakness. His medical history is significant for recurrent syncope for 3 years, chronic hyponatremia treated as SIADH, hypothyroidism and Pituitary macroadenoma that was incidentally discovered 4 years prior to admission on MRI brain and was never treated. Prior to admission, He was started on levothyroxine, but he stopped taking it as he felt that his symptoms were getting worse. Vital signs revealed Blood pressure: 111/70mmHg, Heart rate 70 bpm. Laboratory results showed plasma sodium 123 mg/dl (RR135-145), Potassium 4.4mg/dl RR (3.5-5.5) TSH 9.66mcg/dl RR (0.5-5.0), free T4 0.33 RR (5-11) mcg/dl. He was treated with Tolvaptan 7.5mg once for hyponatremia attributed to SIADH. He was again discharged home on Levothyroxine and sodium chloride tablets. After discharge as he was still complaining of weakness and fatigue, he was referred to the Endocrinology clinic. Pituitary, adrenal and sex hormones were checked, revealed an 8am cortisol of 2.3mcg/dl RR (7-15mcg/dl AM), ACTH 19pg/dl RR (6-50), FSH 0.8mIU/ml RR (2.8-55.5), LH <0.1mIU/ml RR (11.3-56.4), Prolactin 31.5ng/ml RR (2.1-17.7), Free Testosterone 0.3pg/ml RR (30-135), Total Testosterone 3ng/dl RR (250-1100), IGF-1 Z score -2.6, Somatomedin 22ng/ml RR (34-246), ADH 1.1pg/ml RR (1-13.3). Review of imaging studies showed an interval resolution of Pituitary macroadenoma with partially empty sella turcica as evidenced in CT head and brain MRI 2 years prior to his most recent admission. He was started on hydrocortisone for possible secondary adrenal insufficiency. After a week, levothyroxine was resumed and salt tablets discontinued. After 3 months, he had dramatic improvement in symptoms and Plasma sodium improved to 140mg/dl.

Discussion: In our case, we emphasize the importance of testing and treatment of adrenal insufficiency before starting thyroxin replacement, as the clinical presentation and laboratory findings of hyponatremia can be found in both adrenal insufficiency and hypothyroidism. It is valuable to look for secondary adrenal insufficiency in patients with previously diagnosed pituitary macradenoma that may undergo interval resolution possibly as a result of Pituitary apoplexy, a rare medical condition in which there is infarction or hemorrhage within the pituitary adenoma.

Conclusion: Pituitary macroadenomas can undergo apoplexy without immediate intervention. Secondary adrenal insufficiency should be diagnosed and treated when clinically suspected to avoid worsening of signs and symptoms in patients with hypothyroidism.

Abstract #1123

A RARE CASE OF A PHEOCHROMOCYTOMA WITH ECTOPIC ACTH

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Objective: Ectopic hormone-secreting pheochromocytomas are rare; only a few case reports exist in the literature. This condition has been associated with increased malignancy, familial syndromes, and ectopic ACTH secretion [1]. We report a case of ectopic ACTH production from a pheochromocytoma.

Case Presentation: A 55 year old female presents to the hospital with malignant hypertension, uncontrolled on a nicardipine infusion. On initial imaging, a left adrenal mass was noted. She reports a new diagnosis of hypertension about two months prior to hospital admission. Upon further questioning, she reports a history of migraines, near syncope and palpitations. Physical exam revealed a cachectic women,anxious,diaphoretic,with no cushingoid features.

Labs reported: 12 pm cortisol 80.9, plasma free metanephrines 3780, normetanephrines 12370, total metanephrines 16150. ACTH 12, PRA 4.5. Repeat cortisol 37.2, 11-Deoxycorticosterone 75, 24-hour urine cortisol 672.2, 24-hour urine total metanephrines 176710, 24-hour urine total catecholamines 4439. BMP was normal.

CT scan of the abdomen revealed a well-defined 11.7x10.9x3.5 cm lesion arising within the left adrenal fossa with displacement of the pancreas, kidney and spleen. MIBG scan demonstrated a 13cm necrotic tumor in the left adrenal gland with MIBG uptake, consistent with pheochromocytoma without any extra adrenal uptake.

A diagnosis of a pheochromocytoma with ectopic ACTH secretion was postulated based on labs and imaging.

The patient was started on phenoxybenzamine and metyrosine. Fourteen days later, patient underwent an exploratory laparotomy and an excision of a left adrenal pheochromocytoma. Surgery was uneventful without any postoperative complications. Stress dose steroids were started the morning of surgery and continued as outpatient. Final pathology revealed a 14cm pheochromocytoma, confined to the adrenal. ACTH staining was positive.

At her follow up visit two weeks post-operative her plasma metanephrines and 24 hour urine catecholamines/metanephrines were within normal range. A cortrosyn stimulation test was within normal limits. Two months after her operation, she was no longer requiring steroids and her subsequent CT imaging was stable. She appeared biochemically cured.

Conclusion: This case reminds clinicians to be aware of screening adrenal masses biochemically, even if the

patient does not display typical features. In this case, the patient's mass was secreting both metanephrines and ACTH. The patient did not exhibit typical Cushingoid features, the tumor was secreting ACTH. With this knowledge, the patient was adequately treated with both phenoxybenxamine and stress dose steroids to avoid any postoperative or perioperative complications.

Abstract #1124

REVISITING ALL NONINVASIVE ENCAPSULATED FOLLICULAR VARIANT OF PAPILLARY THYROID CARCINOMA CASES AT RUTGERS ROBERT WOOD JOHNSON MEDICAL SCHOOL: NOT SO INDOLENT

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Objective: To identify thyroid specimens previously classified as low risk thyroid cancers and evaluate long term outcomes at Rutgers Robert Wood Johnson Medical School, New Brunswick, NJ (RWJMS). Nikiforov et al. [2016] have indicated that noninvasive encapsulated follicular variant of papillary thyroid carcinoma (NIEFVPTC), now renamed noninvasive follicular thyroid neoplasm with papillary like nuclear features (NIFTP) is a condition with a low risk of adverse outcomes. Revision of nomenclature was proposed to remove the cancer diagnosis.
Methods: Retrospective chart review was conducted. Pathology database identified encapsulated follicular variant of papillary thyroid carcinoma (EFVPTC) diagnosed on surgical resection between 1/1/1993 and 9/31/2016 at RWJMS. Pathology reviewed the slides to confirm the diagnosis. Clinical data was collected for extent of treatment and biochemical/structural recurrence.
Results: Data collection revealed 22 cases of EFVPTC. On pathologic reclassification 13 of 22 cases (59%) met criteria for NIEFVPTC and nine (41%) met criteria for invasive EFVPTC. Eight out of 13 (61%) NIEFVPTC cases met criteria for NIFTP. The average tumor size was 2.21 cm. 100% were negative for lymph node metastasis. Four out of eight (50%) underwent radioactive iodine (RAI) treatment. One case was lost to follow up. None of the cases were found to have recurrence.
Five NIEFVPTC did not meet NIFTP criteria. Three of the five cases (60%) were reclassified as classic papillary thyroid carcinoma (PTC), one of which had recurrence. One case (20%) was designated as EFVPTC with capsular invasion. One case (20%) was reclassified as a follicular adenoma.
Discussion: Nikiforov's team studied 109 NIEFVPTC cases, the majority underwent hemithyroidectomy and none received RAI. No adverse outcomes were identified. In 2017, the American Thyroid Association accepted the nomenclature change that places these neoplasms in an indolent category. They note that further studies on malignant potential, psychosocial heath, and economic implications are needed.
Conclusion: The impact of Dr. Nikiforov's large study suggests that some previously recognized thyroid cancers are "benign". We attempted to duplicate these findings at our institution. We identified all cases initially classified as NIEFVPTC. We found that some cases did not meet the strict NIFTP criteria. In fact, one case with recurrence was reclassified as PTC. We want to bring this case to attention to highlight the fact that not all formerly diagnosed EFVPTC meet NIFTP criteria and behave indolently. Thus, we caution the assumption that all formerly NIEFVPTC are NIFTP without thorough pathologic review.

Abstract #1125

SERUM AUTOANTIBODIES DIRECTED TO THE GONADOTROPIN RELEASING HORMONE RECEPTOR ECL2 ARE DIAGNOSTIC OF PCOS

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Objective: Polycystic ovary syndrome (PCOS) is a common endocrine disorder, occurring in up to 10% of reproductive-age women, principally presenting with androgen excess, ovulatory dysfunction, and/or polycystic ovaries. Its clear etiology has not been established. Previous attempts to identify an autoimmune cause have been unsuccessful. We hypothesized that activating autoantibodies directed to the second extracellular loop (ECL2) of the gonadotropin releasing hormone receptor (GnRHR) could be present in PCOS patients and possibly be pathogenic and of diagnostic value. Such antibodies to other G protein receptors have been found to be significant in many disorders affecting predominantly women.
Methods: We identified and synthesized the 28 AA hGnRHR ECL2 loop (GenScript Inc.,Piscataway, NJ) and used this epitope target for an ELISA assay. We analyzed the serum

of 32 patients with PCOS based on Rotterdam criteria and 38 age and BMI matched, ovulatory infertile women. These included 7 diagnosed with Tubal Factor (TF), 12 Male Factor (MFI), and 19 Unexplained infertile women. These samples were obtained with IRB approval from consented subjects attending the Reproductive Endocrinology clinic and assayed under blinded circumstances.

Results: We found a significant increase in the developed ELISA optical density in subjects with PCOS (0.26±0.07) compared to subjects with TF (0.20±0.05; $p<0.01$), subjects with MFI (0.17±0.03;$p<0.01$), and subjects with unexplained infertility (0.17±0.03;$p<0.01$). When these data were analyzed by ROC curve, the Area Under the Curve was 0.94 (±0.03;$p<0.0001$). These differences were maintained regardless of the BMI.

This assay demonstrated a sensitivity of 91% and a specificity of 87% for PCOS.

Conclusion: This autoantibody targeting the 2nd ECL of the GnRHR at the hypothalamic/pituitary level will likely be causative of the abnormal cycling shown by PCOS subjects. The present assay, with validation from our ongoing activity and blocking studies, may represent the desired serological test needed to effectively screen subjects for possible PCOS. This is the first assay that appears to satisfy the criteria needed for screening and evaluating such patients.

Abstract #1126

CLINICAL VALIDITY OF ROSETTAGX REVEAL FOR THE ACCURATE DIAGNOSIS OF PRE-OPERATIVE MEDULLARY THYROID CARCINOMA UTILIZING FNA SMEARS

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Rosetta Genomics

Objective: Medullary Thyroid Carcinoma (MTC) accounts for <5% of all malignant thyroid neoplasms, but causes a disproportionate number of thyroid cancer-related deaths. Early clinical detection, which is important for patient management, can be challenging. Fine-needle aspiration (FNA) is an important tool for the diagnosis of thyroid cancer, however FNA of MTC may be indeterminate on cytology. We developed a microRNA-based assay, RosettaGX RevealTM, which utilizes FNA smears to stratify thyroid nodules with indeterminate cytology as benign, suspicious for malignancy, or positive for medullary thyroid carcinoma. The objective of this study was to characterize Reveal's performance in the clinical setting with regard to MTCs and to present specific clinical cases to demonstrate the benefits of using Reveal.

Methods: Reveal tests for the overexpression of a medullary microRNA marker, hsa-miR-375. During 2016, ~900 thyroid FNAs were tested using Reveal. The cytopathology and clinical information was collected for the cases classified by Reveal as positive for medullary thyroid carcinoma. In addition, an independent, cytopathologist with expertise in thyroid cytology, reviewed the FNA slides used for this study.

Results: Of the clinical samples tested with Reveal, 10 (~1%) were classified as positive for medullary thyroid carcinoma. Of these samples, six were female and four were male, with an average age of 52.3 years (range 19-90). Two FNA samples were diagnosed as Bethesda III, three as Bethesda IV, two as Bethesda V and three as Bethesda VI. For 9 samples, surgical outcome was available and confirmed as MTC, by surgical pathology. Case studies of patients with indeterminate FNA cytology and a Reveal™ result of positive for medullary thyroid carcinoma, are presented. Clinical presentation, diagnostic criteria, differential diagnosis and treatment of these particular cases are reviewed.

Discussion: The Reveal detection of the MTC marker was found to be accurate in previous training and validation studies. In the clinical setting, the assay can identify MTC in cytology specimens where MTC was suspected or even missed. Reveal can thus reduce the risk of an incomplete therapeutic work-up and a less favorable outcome.

Conclusion: It is imperative to know pre-operatively that a patient has MTC to plan the most appropriate surgical procedure. The Reveal assay is beneficial for patients with indeterminate cytology, using the same FNA slide as that used to make the cytology-based diagnosis. This allows for early diagnosis of MTC and determination of appropriate surgical intervention, thus leading to decreased risk of morbidity and mortality associated with MTCs.

Abstract #1127

A NOVEL TREATMENT FOR TYPE B INSULIN RESISTANCE

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Objective: 1. To present a case of Type B Insulin Resistance (TBIR), a rare yet serious autoimmune endocrine disorder. 2. To describe the use of an SGLT2 inhibitor as a novel therapy for severe cases of TBIR, refractory to high doses of insulin.
Methods: Case report with review of current literature on SGLT2 inhibitor use as novel therapy for patients with severe insulin resistance.
Case Presentation: A 20-year-old African-American woman with a history of presumed DM type 2 with total daily dose (TDD) of 16 units of insulin (0.27 units/kg), mixed connective tissue disease and hypothyroidism, who presented with seizure-like activity and acute kidney injury due to lupus nephritis. On initial labwork, she was found to be hyperglycemic with blood glucose (BG) 627 mg/dL. Due to progressive hyperglycemia refractory to subcutaneous insulin, she was transitioned to IV insulin infusion (IVII), with requirements of up to 60 units/hr (TDD 1560 units) and eventually switched to high doses of U500 insulin. Specific work up showed C-peptide of 11.16 ng/mL with total insulin level >1500 IU/L while transiently off IVII. Adiponectin level was elevated at 42 mcg/mL (0.8-3.85 mcg/mL), and insulin receptor antibody (IRAb) titer later returned positive. Prior to immunomodulatory treatment, empagliflozin 10 mg daily was started resulting in improvement of average BGs from 369 mg/dL on 410 units/day of insulin to 188 mg/dL on 330 units/day in 24 hours. Subsequently, the NIH standardized protocol with rituximab, cyclophosphamide and pulse-dose steroids was initiated and remission was achieved after 2 cycles (in 3 months).
Discussion: TBIR is a rare autoimmune disorder where autoantibodies (Abs) are produced against the insulin receptor, leading to hyperglycemia, and more rarely, hypoglycemia. This is classically characterized by the presence of an underlying rheumatologic disease, periocular acanthosis nigricans, and labs showing elevated adiponectin (>7 mcg/mL), low triglycerides, elevated HDL and positive titers of IRAbs. We present a case of a patient with TBIR with severe hyperglycemia refractory to high doses of insulin, that improved dramatically with the use of a novel therapy, an SGLT2 inhibitor, in addition to the standard NIH treatment protocol.
Conclusion: TBIR has high mortality (54% in the largest TBIR cohort to date) but very low prevalence, precluding any randomized, placebo-controlled studies from being done to date. In this case report we describe the use of empagliflozin, an SGLT2 inhibitor, as a novel therapy for Type B insulin resistance, that ultimately led to remarkable BG improvement and reduction of insulin requirements, prior to initiation of the standardized immune-targeted protocol.

Abstract #1128

DEEP IN A COMA: AN INTRIGUING CASE OF MYXEDEMA COMA

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Case Presentation: A 65-year-old female with history of hypothyroidism and primary brain cancer status post radiation and chemotherapy presented with altered mental status. On presentation, she was hypothermic with rectal temperature of 92.6F, hypotensive to 86/41 mmHg, bradycardic with heart rate in the 30s, and hypoxic with SpO2 of 89%. The patient was noted to be lethargic with thin coarse hair, facial edema and periorbital swelling. She was admitted to the MICU for septic shock secondary to E. coli urinary tract infection and pneumonia.
Further history elicited from family revealed the patient's inability to swallow pills, including her levothyroxine. TSH was found elevated at 38.297µIU/mL, with undetectable free T4 and T3. ACTH stimulation test showed appropriate cortisol response. Diagnosis of myxedema coma was made and the patient was started on intravenous hydrocortisone, as well as weight-based intravenous levothyroxine 50mcg daily and enteral liothyronine 10mcg three times daily. The patient's heart rate normalized and mentation improved shortly after. After two weeks, thyroid function tests returned to normal range with a TSH of 2.312µIU/mL, free T4 of 0.74ng/dL, and total T3 of 78ng/dL. Liothyronine was stopped, and patient was transitioned to 300mcg intramuscular injection of levothyroxine once weekly for ease of administration.
Discussion: Myxedema coma is a rare but life-threatening complication of severe hypothyroidism. It classically presents with altered mentation, hypothermia, hyper or hypotension, bradycardia, and hypoventilation. It is often precipitated by events such as acute infection, electrolyte imbalances, medications, or stroke. Treatment involves correction of the underlying precipitant along with high dose intravenous levothyroxine and liothyronine. Concurrent steroid therapy should be included when adrenal insufficiency is suspected.

In our case, the patient's mildly elevated TSH did not correlate with the severity of her clinical symptoms. We postulate that her relative low TSH level was due to her history of primary brain cancer and subsequent treatment with radiation and chemotherapy that lead to a blunted pituitary response. Her other pituitary hormones were also low, with FSH of 4.0mIU/mL, LH of 0.88mIU/mL, ACTH of 11pg/mL and IGF-1 of 47ng/mL. Clinical recognition of the symptoms of myxedema is crucial for early diagnosis and treatment.
Conclusion: Myxedema coma is a rare presentation of severe hypothyroidism with a high mortality rate. There may be discrepancy between lab results and clinical symptoms, thus early recognition and treatment that takes into account a patient's medical history is essential for improved outcomes in a critical care setting.

Abstract #1129

A CASE REPORT OF PANCREAS METASTASES FROM PAPILLARY THYROID CARCINOMA

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Case Presentation: An 84-year-old female felt a lump in her neck in October 2014. A fine needle aspiration was performed and the cytology showed papillary thyroid cancer (PTC). She had a total thyroidectomy with left neck dissection. Surgical pathology showed a 3.3 x 2.3 x 1.3 cm PTC, tall cell variant, involving the left lobe and isthmus. Extrathyroidal extension and lymphovascular invasion were present. Metastatic PTC was found in five of six lymph nodes from the left neck dissection. The Tumor-Node-Metastasis (TNM) stage was IVa (pT3N1bM0). In January 2015, she had radioiodine remnant ablation with 157 mCi of I-131 after preparation with thyrogen. A post-therapy whole-body survey showed uptake in the thyroid bed bilaterally, without evidence of metastatic disease. She returned for follow-up in June 2015 and her thyroglobulin antibody level was elevated at 113 IU/mL, but the thyroglobulin level was not processed by the laboratory. Her neck ultrasound was negative. In January 2016, her thyroglobulin antibody level was elevated at 101 IU/mL, thyroglobulin level was <0.4 ng/mL. Given high-risk for recurrence, and that serum thyroglobulin is unreliable given the presence of thyroglobulin antibodies, an FDG-PET scan was ordered to evaluate for occult local or distant metastases. In May 2016, an FDG-PET scan showed abnormal uptake within the lymph nodes in the inferior thyroid bed, consistent with metastatic thyroid malignancy. In addition, focal uptake was nodule in the pancreatic body. A CT of the abdomen showed a 1.1 cm mildly enhancing mass at the body of the pancreas. This corresponded to the metabolic active lesion seen on the PET scan. She had an upper GI endoscopy, with endoscopic ultrasound-guided fine needle aspiration biopsy of the pancreatic mass. Pathology showed pieces of normal pancreas and papillary formations. The papillae were covered by cells with round to irregular nuclei with a salt and pepper chromatin pattern. Occasional nuclei were folded, forming nuclear grooves. Immunohistochemical stains show that the nuclei were positive for TTF-1. The cells were weakly positive for CD57 and negative for monoclonal CEA. The final diagnosis was consistent with metastatic PTC. In addition, both the tissue specimens from the thyroid and the pancreas were positive for the BRAFV600E mutation.
Conclusion: Distant metastases in PTC are seen infrequently and usually occur in the lungs, bones, and thoracic lymph nodes. PTC metastasizing to the pancreas is extremely rare, and there are only 12 other cases reported in the literature from 1991 to 2014. In this case report, we present a patient with PTC metastasized to the pancreas, with novel testing in genomic characterization.

Abstract #1130

ARTIFICIAL INTELLIGENCE POWERED COACHING FOCUSED ON ROUTINE PHYSICAL ACTIVITY TO ACHIEVE DAILY ACTIVITY TARGETS IN SUBJECTS WITH TYPE-II DIABETES

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Objective: Practitioners in South Asia advise people with diabetes (T2DM) to undertake planned or recreational physical activities for achieving the AACE recommended 30 min of daily or 150 min of weekly activity. However, studies have shown that fewer than 10% Indians habitually engage in planned or recreational physical activity. We attempted a different approach to achieve physical activity targets through increasing daily routine activity by equipping participants with a smartphone app that automatically tracks their physical activity and coaches the users using an artificial intelligence (AI) powered health coach chatbot.
Methods: Participants were tracked and coached for increasing routine physical activity using the Wellthy

Diabetes App, a smartphone application prescribed by treating physicians, that uses the phone's activity sensor to track the duration of time participants were active. This intervention was incremental and supportive to the existing standard of care recommended by the treating physician. For this study, we analyzed de-identified data from subjects who had used the app for at least 21 days and had activity tracking data for at least 15 days.

Results: One seventy-eight participants (Mean Age : 37.3 yrs & 59.6% Males) were tracked for an average of 28.3 days (95% CI: 27.9 - 28.8) resulting in 7,316 person-days and 1,451 person-weeks of activity tracking. Mean weekly active time (MWAT) was 256 min (95% CI: 224 - 289) with the median of 189 min (25th-75th: 116 - 330 min). Mean daily active time (MDAT) recorded was 49 min (95% CI: 43 - 55) with a median of 39 min (25th-75th: 24 - 60 min). MDAT was significantly higher for males (54.6 min) than females (40.4 min; p=0.01). In general, active time was higher on weekdays (mean: 52 min) versus weekends (mean: 48.3, p=0.005). The daily target of 30 minutes of activity was achieved on 55.6% of person-days (n=4069, 95% CI-54.5 -56.8) while the weekly target of 150 minutes of active time was achieved in 55.9% of person-weeks (n=811; 95%CI-53.3- 58.5).

Discussion: Participants in the study recorded routine activity at par with AACE recommended time targets for daily and weekly activity. Participants also achieved daily and weekly activity targets frequently.

Conclusion: This early data demonstrates the potential of an AI-powered diabetes management app, focused on coaching and nudging to improve routine daily physical activity, as a promising prescriptive tool for physicians to support people with T2DM in urban South Asia to achieve their physical activity targets.

Abstract #1131

SERUM THYROGLOBULIN AND THYROTROPIN LEVELS AND THE RISK OF THYROID CANCER IN RADIATION EXPOSED SUBJECTS

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Objective: Higher Thyrotropin (TSH) and Thyroglobulin (Tg) levels are associated with an increased risk of malignancy in thyroid nodules in general population but have been incompletely evaluated in people exposed to external radiation, a known risk factor for thyroid cancer. This study aimed to examine the relationships between baseline TSH and Tg levels and the risk of thyroid nodules and cancer in a radiation exposed cohort.

Methods: In 1974, 887 subjects who received external radiation treatment for benign head and neck area conditions as children during 1939-1962 were examined and followed for up to 25 years. All subjects underwent a clinical evaluation which included a physical exam, measurements of the TSH, Tg, anti-Tg antibodies and thyroid imaging. Subjects with prior thyroid surgery or use of levothyroxine were excluded.

Results: After excluding 81 subjects, in 806 subjects, 216 had thyroid nodules and 548 did not. Of subjects with nodules, 176 had surgery with 55 confirmed thyroid cancers. During follow-up, 147 subjects developed thyroid nodules including 22 with thyroid cancer. We performed cross-sectional and longitudinal analyses to evaluate the relationship between TSH and Tg measured at the 1974 visit and the prevalent thyroid nodules and cancers at baseline and the incident nodules and cancers found during follow-up. There was no relationship between TSH levels and the prevalent presence or absence of thyroid nodules, whether a prevalent nodule was benign or malignant, subsequent development of thyroid nodules during follow-up, or whether an incident nodule was benign or malignant. In contrast, Tg levels were higher in subjects with prevalent thyroid nodules (24.6 ng/mL vs 8.8 ng/mL; $p < 0.01$) and in those who had an initial normal exam but who later developed incident thyroid nodules (11.2 ng/mL vs 8.8 ng/mL; p=0.017). There were no differences in the Tg levels between those with benign vs malignant prevalent (p=0.66) or incident (p=0.95) nodules.

Conclusion: Baseline Tg levels provide an early indication of an increased risk of developing thyroid nodules and thyroid cancer in patients exposed to childhood radiation. However, they do not help differentiate between benign and malignant nodules. Baseline TSH levels are not associated with the risk of developing thyroid nodules and cancer in radiation exposed subjects.

Abstract #1132

THE EFFECTS OF STATINS AND β-BLOCKERS ON PRO-INFLAMMATORY CYTOKINE SECRETION BY HUMAN CORONARY ENDOTHELIAL CELLS

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Objective: Inflammatory and oxidative stress in endothelial cells are implicated in the pathogenesis of premature atherosclerosis in people with diabetes.

Methods: Human coronary artery endothelial cells (HCAEC) were exposed to either 5.5 or 27.5 mM dextrose

for 24-hours and interleukin-1β (IL-1β), interleukin-2 (IL-2), interleukin-6 (IL-6), interleukin-8 (IL-8), and tumor necrosis factor α (TNF α) levels were measured by enzyme immunoassays. To determine the effect of statins and β-blockers on inflammatory cytokine secretion from cells exposed to 5.5 mM and 27.5 mM dextrose, the cells were also treated with the HMG coA reductase inhibitors simvastatin and pravastatin as well as the β-blockers carvedilol, atenolol, and propranolol and the above cytokines were measured in the conditioned medium.
Results: IL-1β levels in culture media from cells treated with 27.5 mM dextrose increased relative to cells exposed to 5.5 mM dextrose. Treatment with simvastatin and pravastatin decreased IL-1β, IL-6, and IL-8 level from cells exposed to both 5.5 mM and 27.5 mM dextrose. Likewise, treatment with carvedilol, atenolol, and propranolol reduced IL-1β, IL-6 and IL-8 levels in culture media from cells maintained at 5.5 mM and 27.5 mM dextrose. IL-2 and TNF α concentrations in culture media were below the limit of detection under all experimental conditions studied suggesting that these cells may not synthesize detectable quantities of these cytokines.
Conclusion: These results suggest that dextrose at high concentrations increases IL-1β release from HCAEC but had no effects on IL-6 and IL-8 release. Furthermore, statins and β-blockers repressed pro-inflammatory cytokine release at both dextrose concentrations examined.

Abstract #1133

NECK ULTRASOUND IN THE LONG-TERM SURVEILLANCE OF PATIENTS WITH FOLLICULAR THYROID CARCINOMA

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Objective: The primary objective of this study is to analyze the diagnostic value of ultrasound (US) in patients with Follicular Thyroid Cancer (FTC). The secondary aims are to evaluate if initial American Thyroid Association (ATA) risk stratification modified the diagnostic value of neck US, and to assess for most likely imaging modality to detect structural disease in our cohort.
Methods: We conducted a retrospective cohort study of 44 patients with FTC. The patients were identified through a query of the Ohio State University Endocrine Neoplasia Repository database. We included all patients with well differentiated FTC who underwent total thyroidectomy and radioactive iodine (RAI), with a thyroglobulin (Tg) measurement and an US at least 6 months after the RAI (N=33). For analysis of the secondary endpoint, we also included patients who did not have an US during follow up but had other imaging modalities (N=11).
Results: Of the 33 patients who had neck US evaluation, 5 patients had evidence of structural disease. 3 of these patients had neck disease identified by neck US. The neck disease along with other metastatic foci was identified with other imaging modalities in all patients. 0/24 (0%) of patients with Tg excellent response had positive US, whereas 3/9 (33%) with Tg incomplete/indeterminate response had positive US. Similarly, 0/18 (0%) of patients with ATA low risk cancer had positive US, whereas 3/12 (25%) of patients with ATA high risk cancer had positive US. Of all 44 patients, 9 had structural disease. 0/31 (0%) of patients with Tg excellent response had positive cross-sectional or functional imaging, whereas 9/13 (69%) with Tg incomplete/indeterminate response had positive imaging. Similarly, 0/23 (0%) of patients with ATA low risk cancer had positive imaging, whereas 8/16 (50%) of patients with ATA high risk cancer had positive imaging. 5 patients had unknown ATA risk.
Discussion: The 2015 ATA guidelines recommend periodic US examinations for low risk patients and periodic US/CT/MRI for high risk patients with excellent response to therapy, with intensification of follow up if non-excellent response to therapy. These guidelines are based on studies of patients with papillary thyroid cancer.
Conclusion: Our findings suggest that neck ultrasound in FTC is unlikely to find structural disease in patients with excellent response to initial treatment determined by Tg level. They also suggest that in patients with biochemical incomplete/indeterminate disease, neck US may not be sufficient in attempting to find structural disease as cross-sectional or functional imaging may identify new or additional disease that was not found on neck US.

Abstract #1134

TREATMENT OF DKA IN TEACHING VS NON-TEACHING HOSPITALS

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Objective: Diabetic ketoacidosis is a life-threatening complication of diabetes mellitus that affects thousands of patients per year, with increasing rates of prevalence. DKA is managed in an inpatient setting, with care distributed between teaching and non-teaching hospitals. Teaching hospital status has been associated with similar rates of mortality, cost, and length of stay for various inpatient conditions. However, few studies have looked at differences in outcomes in DKA depending on hospital

teaching status. Thus, we aimed to evaluate the differences in clinical outcomes for patients admitted for diabetic ketoacidosis in teaching versus non-teaching hospitals.

Methods: Data was obtained from the Nationwide Inpatient Sample database from 2011-2013. Patients with DKA were identified by ICD-9 codes (250.1 and 250.3) as the first or second diagnosis on admission. Patient baseline characteristics including age, race, sex, and comorbidities were abstracted. The comorbidities were assessed according to the Charlson Comorbidity Index (CCI). The relationship between teaching vs non-teaching status with length of stay, hospital cost, and mortality was analyzed using chi-squared and two-tailed T-tests as appropriate. Significant threshold was set at $p<0.05$.

Results: A total of 2,050 patients were admitted to teaching hospitals and 3,797 patients were admitted to non-teaching hospitals. Demographics in teaching vs non-teaching admissions, respectively, were as follows: mean age 54.6 years vs 52.7 ($p< 0.001$); Caucasian 802 (39.1%) vs 2,318 (61%) ($p<0.001$); African American 714 (34.8%) vs 779 (20.5%) ($p<0.001$); Hispanic 312 (15.0%) vs 277 (7.3%) ($p<0.001$). Patients admitted to teaching hospitals had an average length of stay of 5.17 days vs 3.89 days in non-teaching hospitals, ($p<0.001$). The cost of hospitalization for those admitted to teaching hospitals was $61,246.95 vs $38,098.43 in non-teaching hospitals ($p<0.001$). Of those admitted for DKA, 133 (6.48%) died in teaching hospitals and 129 (3.39%) died in non-teaching hospitals ($p<0.001$). There was a higher proportion of patients with CCI >5 admitted to teaching vs non-teaching hospitals (9.56% vs 5.0%, $p< 0.001$).

Discussion: We found that patients admitted to teaching hospitals have higher mortality rates, longer lengths of stay, and increased costs of hospitalization, which we believe is attributable to these patients having a higher comorbidity index.

Conclusion: Patients admitted to teaching hospitals with DKA have increased lengths of stay, increased costs of hospitalization, and decreased survival rates compared to those admitted to non-teaching hospitals.

Abstract #1135

AUTO STUDY: AUTOMATIC TITRATION TO TARGET:SQ INSULIN MANAGMENT USING ELECTRONIC GMS IN THE NON-ICU

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Objective: Hyperglycemia effects 30-40% of hospitalized patients and can be linked to poor outcomes: including increased mortality, longer length of hospitalization, surgical site infections and increased readmissions. The standard of care in non-critical patients is subcutaneous (SQ) basal bolus insulin therapy (BBI). Despite AACE guideline recommendations, best practice education and new BBI order sets; there is a persistence of sliding scale insulin (SSI) use at many hospitals. There are many barriers to adopting best practices, including lack of diabetes and endocrinology management expertise. An electronic glycemic management system (eGMS) was studied to evaluate success of adoption of BBI managed by computer base insulin doing algorithm.

Methods: This retrospective quality improvement study analyzed hyperglycemia rates for patients needing SubQ basal bolus insulin managed with an (eGMS). 1,687 patients at 9 hospitals treated with eGMS had data available over a 6-month interval. The target blood glucose (BG) was set at 140-180mg/dL. Inclusion criteria: Non-ICU patients with an admission BG of 140-400 mg/dL. This study evaluated daily adjustments made for Breakfast, Lunch, Dinner and Bedtime and BG averages from admission to discharge. Safety was measured by the percent of patient days with mild to moderate hypoglycemia (<70mg/dL), severe hypoglycemia (<40mg/dL) and hyperglycemia (>250mg/dL).

Results: Daily hyperglycemia average on admission was 204.88mg/dL and 165.80mg/dL on day of discharge, reduction of 39.08mg/dL; admission Breakfast 195.69mg/dL and discharge at 153.44mg/dL, reduction of 42.25mg/dL; admission lunch 216.07mg/dL and 168.50mg/dL, reduction of 47.57mg/dL; admission dinner 200.70mg/dL and discharge 170.88mg/dL, reduction of 29.82mg/dL. The percent of patient day hypoglycemia (<70mg/dL) 0.08%, severe hypoglycemia (<40mg/dL) 0.0% and hyperglycemia (>250mg/dL) 11.29%. Average time on eGMS SubQ was 5.9 days.

Discussion: Hospital prescribers using eGMS to titrate their patients BBI SubQ regimen achieved the prescribed glycemic target of 140-180 mg/dL at breakfast, lunch, dinner and bedtime with low incidence of hypoglycemia (<70 mg/dl & 40 mg/dL). The daily glucose average was

reduced 19% from admission to discharge over ~6 days of insulin managment.
Conclusion: These results suggest eGMS SubQ can maintain glucose control within the recommended glucose targets without increased risk of hypoglycemia.

Abstract #1136

POSTMENOPAUSAL ADRENAL EXPRESSION OF THE LUTEINIZING HORMONE/HUMAN CHORIONIC GONADOTROPIN RECEPTOR IN ALDOSTERONE-PRODUCING CELL CLUSTERS

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Objective: In aging adults, the zona glomerulosa (zG) regresses into nests of cells known as Aldosterone-Producing Cell Clusters (APCCs). Current evidence points at these APCCs as precursors to adenomas and Primary Aldosteronism (PA). The adult adrenal cortex also contains stem cells that come from a common gonadal embryologic origin, and have been shown to retain the Luteinizing Hormone/human Chorionic Gonadotropin Receptor (LH/hCGR). Recent case reports have proven that high LH/hCG levels can lead these cells towards adenomatous growth and PA, particularly during pregnancy and after menopause. This study aims to demonstrate the expression of LH/hCGR in APCCs of postmenopausal women.
Methods: Samples from a repository of adrenal tissue were obtained for immunohistochemistry. Double staining was performed for CYP11B2 (Aldosterone Synthase) and LH/hCGR. Slides were obtained from 4 postmenopausal women (ages ranging from 54 to 65 years old), in addition to 2 controls (a 24 year-old male and a 49 year-old female). An independent reviewer evaluated the slides for the presence of APCCs and co-staining of the antibodies.
Results: All postmenopausal samples exhibited at least 4 or more cell bundles dipping from the capsule into the zona fasciculata. These structures heavily stained for CYP11B2, and were consistent with APCCs. Staining for LH/hCGR concentrated evenly in the subcapsular region of all sampled slides, becoming less evident at greater depths. 3 of the 4 postmenopausal slides exhibited APCCs that clearly co-expressed membrane-predominant CYP11B2, in addition to cytoplasmic LH/hCGR staining. Of the controls, the 24 year-old male exhibited a distinct CYP11B2-stained zG with only one APCC, while the 49 year-old female exhibited histology similar to the postmenopausal cases, although with less APCCs. Both exhibited similar double staining.
Discussion: The prevalence of PA is higher the previously thought, particularly among aging adults and women. Age appeared to have a graded effect in the number of APCCs seen in the samples. APCCs have been linked to increasing age and to higher aldosterone production. Co-staining was observed in five out of six cases. LH/hCGR expression was specific to APCCs and the subcapsular region, which is consistent with the known location of adrenal stem cells. Recent research has shown LH/hCGR over-stimulation may cause a second hit required for adrenal tumorigenesis. Genetic studies also show APCCs harbor mutations that can drive aldosterone overproduction.
Conclusion: Postmenopausal women exhibited a large number of APCCs with high co-expression of LH/hCGR. Future research is needed to elucidate the possible role of LH as a driver of the formation of PA producing adenomas.

Abstract #1137

COMPARATIVE EFFICACY OF 3 SGLT2 INHIBITORS AS THE FIFTH DRUG IN THE MANAGEMENT OF TYPE 2 DM IN ASIAN INDIANS NOT CONTROLLED WITH ATLEAST 4 ORAL ANTI DIABETIC DRUGS

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Objective: To evaluate comparative efficacy of the 3 SGLT2 inhibitors (Dapagliflozin, Empagliflozin and Canagliflozin) as an add-on therapy along with stricter lifestyle modification in Asian Indian type 2 diabetes mellitus (T2DM) patients with inadequate glycemic control despite receiving an optimum dose of at least 4 oral antidiabetic drugs (OADs).
Methods: A retrospective analysis of data of 808 T2DM patients visiting a diabetes speciality center with $\geq$ 6 month follow up duration was done. Patients were treated with an SGLT2 inhibitors Dapagliflozin 10mg(n=256), Empagliflozin 25mg (n=110) and Canagliflozin 100mg (n=442) as an add-on drug along with stricter lifestyle modification in patients who had inadequate glycemic control despite receiving optimum doses of at least 4 OADs (Metformin, Sulphonylurea, Pioglitazone, DPP4 Inhibitors or Alpha Glucosidase Inhibitors) and who refused initiation of insulin.
Results: The average age of the patients was 51.63yrs with 57.7% males, average weight 81.95±16.08 kg and

mean duration of diabetes was 34.08±39.04 months. The baseline demographic characteristics, duration of diabetes, Baseline HbA1c, and existing drugs were comparable among 3 groups. All the 3 groups were equally effective in getting glycemic control of FBS <120 mg/dl and PPBG <180 mg/dl and overall 87.4 % of the cases responded to addition of SGLT2 inhibitors. Overall SGLT2 inhibitors were able to significantly reduce FBS by 63.65mg/dl and PPBG by 79.28mg/dl but Canagliflozin had highest reduction of 24.1% and 24.7% respectively(p=0.001). Overall mean HbA1c reduced by 1.63±0.99%. Canagliflozin significantly reduced HbA1c(1.72%) as compared to Dapagliflozin(-1.49%) and Empagliflozin (-1.59%) (p=0.002),while between Dapagliflozin and Empagliflozin, the difference was non significant(p=0.376). The mean weight loss was 3.8 % from baseline (p=0.001). Canagliflozin had highest fall of 4.1% which was significant compared to Dapagliflozin only(3.2%)(p=0.001), but not Empagliflozin(3.4%) (p=0.182).

Conclusion: All 3 SGLT2 inhibitors are equally effective in achieving the desired glycemic control when added with strict lifestyle modification to T2DM patients, inadequately controlled on atleast 4 drugs. Canagliflozin had slightly higher reduction in FBG, PPBG, HbA1c and weight reduction(p<0.05). All 3 responded almost similarly with respect to either Age, Sex, duration of diabetes or BMI.

Abstract #1138

AN UNDER-RECOGNIZED ENTITY: DIABETES MELLITUS (DM) TYPE 3C DUE TO A SINGLE EPISODE OF ACUTE PANCREATITIS (AP)

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Objective: We present a case of rapid-onset pancreatogenic glucose intolerance due to a single episode of severe acute pancreatitis and review pertinent literature.

Case Presentation: A 21-year-old woman was admitted for severe acute pancreatitis complicated by splenic vein thrombosis which was medically managed. The patient reported binge-drinking 4 days weekly for at least 9 months. She denied personal history of pancreatitis as well as family history of pancreatic disease including DM or malignancy. Fasting glucose 5 months earlier had been 85 mg/dL (74-106). Serum glucose during this hospitalization peaked at 415 and remained >300 prior to insulin drip. The patient was transitioned to glargine and maintained on 12 units nightly with lispro correction scale before meals prior to endocrinology consultation. Admission HbA1c was 5%; on day 8, repeat came back 5.8% without microcytosis or transfusion. C-peptide drawn when glucose was 147 returned 0.2 ng/mL (0.8-3.5). On day 10, fasting point-of-care glucose was 80 following administration of glargine 10u. Nutritional evaluation yielded iron 25 ug/dL (49-181) with ferritin 1973 ng/mL (15-150), vitamin B12 >2000 pg/mL (211-911), folate 4.13 ng/mL (4-1000) and vitamin D,25OH 10.5 ng/mL (30-100); fecal elastase was not checked. Gastroenterology (GI) consultants initiated empiric pancrelipase before meals.

Discussion: Pancreatogenic diabetes mellitus is classified by the ADA as type 3c, due to exocrine insufficiency of the pancreas. While literature exists to inform management of DM3c due to the two most common causes, chronic pancreatitis and cystic fibrosis, data is scarce for other etiologies including acute pancreatitis. Only 11 retrospective case-control studies, observational studies, systematic reviews, and a Taiwanese national survey on this topic have been reported in primarily GI journals since 2013. They agree only on higher incidence in men. There is no consensus on: 1) the causal relationship between glucose intolerance and AP, 2) the resulting true incidence of DM3c after AP (findings range 14-61%), 3) the correlation between development of endocrine insufficiency and AP severity, 4) the significance of a specific etiology of AP, and 5) the temporal and pathophysiologic relationship between endocrine and exocrine pancreatic insufficiency after AP. An in-press article published from New Zealand in January 2017 proposes use of the PERSEUS score to predict risk of developing DM3c after AP.

Conclusion: Further research is required to clarify the risk of developing DM3c after AP. Ultimately, guidelines are needed to optimize management of DM3c due to AP and prevent diabetic complications in these patients.

Abstract #1139

IMPROVED TREATMENT ENGAGEMENT AMONG PATIENTS RECEIVING INSULIN GLARGINE 300 UNITS/ML WHO ENROLLED AND RECEIVED LIVE SUPPORT THROUGH THE COACH PATIENT SUPPORT PROGRAM

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Objective: The insulin glargine 300 units/mL (Gla-300) COACH Support Program provides support for patients (pts) with diabetes initiating Gla-300 by delivering tailored, product-focused educational materials and encouraging lifestyle changes for better glycemic control. This analysis specifically evaluated the impact of COACH live phone support on treatment engagement.
Methods: Pts who enrolled in COACH received a welcome call from a Guide to identify specific disease/therapy management needs. Ongoing support included contact with the Guide to reinforce healthcare provider recommendations and access to training sessions/digital tools. Pts who filled a first prescription for Gla-300 in April−December 2015 and completed the welcome call were matched to control pts from the Symphony Health Solutions Integrated Dataverse™ prescription claims database, based on demographic attributes (age, gender, geographic location, prior use of insulin/other agents, diabetes type, insulin dose, co-pay, and payer type). Number of refills and days on therapy (days of Gla-300 supply summed for all pts divided by total number of pts) were determined at 6 and 9 months.
Results: The analysis population included 1,724 COACH pts and 1,724 matched controls. The COACH and control cohorts comprised: 52% men, 48% women; 22% aged 18−47 years, 23% 48−55 years, 27% 56−61 years, and 28% >61 years. A total of 99% of pts had used insulin in the 1-year period prior to the welcome call (45% insulin glargine 100 units/mL; 54% another insulin), and 71% had a co-pay of $15 on their first paid Gla-300 prescription claim. More COACH vs control pts had commercial health insurance (42% vs 34 %) and Medicare coverage (12% vs 5%); 43% and 58% COACH and control pts, respectively, received coupons/discount cards or payment aids (P<0.0001 for all).
After 6 months, COACH pts refilled their prescription on average 3.2 times vs 2.4 times for control pts; at 9 months, the average number of refills was 4.7 for COACH pts vs 3.6 for control pts (P<0.0001 for both time points). The average number of days on therapy was 102.2 and 151.9 for COACH pts, and 81.5 and 121.6 for control pts, at 6 and 9 months of follow-up, respectively (P<0.0001 for both time points).
Discussion: At 9 months, an increase of 32% and 25% in number of prescription refills and length of therapy, respectively, was observed for the COACH cohort vs control cohort.
Conclusion: Pts who received live phone support through the COACH program were more likely to refill their prescriptions and stay on therapy. Enrollment in programs with a phone-support component may contribute to improved insulin therapy.

Abstract #1140

VASCULAR COMPLICATIONS AND COMORBIDITIES ASSOCIATION IN TYPE 2 DIABETES PATIENTS- A RETRO STUDY OF APOLLO SUGAR CLINICS

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Apollo Sugar Clinics

Objective: Type 2 diabetes (T2D) is a multifactorial condition, usually manifests as a consequence of associated co-morbid conditions and may later inhabit with chronic complications. Therefore it becomes imperative to regularly monitor and manage the condition to prevent it from bad to worse with complication. The study purpose was to determine the prevalence of micro- and macrovascular complications in T2D patients registered at Apollo Sugar Clinics, India.
Methods: This was a retrospective analysis of 1918 T2D patients registered from January 2016 to December 2016. Patients were evaluated for microvascular (nephropathy, neuropathy, and retinopathy) and macrovascular (CAD and IHD) complications prevalent at the time of registration. Data was analyzed using appropriate statistical tests and significance was tested at $p \leq 0.05$.
Results: The mean age of the patients (N=1918) was 50.3 years, males and females were 1166 (60.8) and 752 (39.2), respectively. The overall prevalence of diabetes associated complications was 9.4%, of these micro, macro and both vascular complications were observed in 78 (4.1), 79 (4.1) and 24 (1.3), respectively. Further, these complications were significantly high in patients associated with comorbidities ($p < 0.001$), in age group >40 years ($p <$

0.002), males (0.02) and duration of disease (0.02).
Conclusion: Diabetes patients have high disease burden with complications in the patients with comorbidities, long duration of disease, more than 40 years of age and male gender. Thus, diabetes patients who are at high risk should be categorized to homogenous groups and a target treatment should be recommended to prevent onset of complications.

Abstract #1141

EFFICACY AND SAFETY OF INITIAL COMBINATION THERAPY WITH CANAGLIFLOZIN (CANA) AND METFORMIN EXTENDED-RELEASE (MET) IN DRUG-NAÏVE PATIENTS WITH TYPE 2 DIABETES MELLITUS (T2DM) BY LATINO/HISPANIC ETHNICITY

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Objective: AACE guidelines support initiating dual therapy in patients with T2DM with A1C ≥7.5%. Since sodium glucose co-transporter 2 (SGLT2) inhibitors are the first oral agent recommended after MET in the AACE guidelines, initial combination therapy with an SGLT2 inhibitor + MET may be a reasonable choice for patients with elevated A1C. In a Phase 3 study, initial combination therapy with CANA + MET demonstrated reductions in A1C, body weight (BW), and systolic blood pressure (SBP) and was generally well tolerated in drug-naïve patients with T2DM over 26 weeks. This post hoc analysis assessed the efficacy and safety of initial combination therapy with CANA + MET vs. MET in subgroups by ethnicity (Latino/Hispanic vs. non-Latino/Hispanic).
Methods: In this double-blind study, drug-naïve patients with T2DM (N=1186; mean age, 54.9 y; A1C, 8.8%; T2DM duration, 3.3 y) were randomized to receive CANA 100 mg/MET (CANA100/MET), CANA 300 mg/MET (CANA300/MET), CANA 100 mg (CANA100), CANA 300 mg (CANA300), or MET over 26 weeks. Data were analyzed based on ethnicity (Latino/Hispanic [n=347; mean A1C, 9.2%; BW, 84.5 kg; SBP, 125.2 mmHg], non-Latino/Hispanic [n=830; mean A1C, 8.7%; BW, 93.8 kg; SBP, 130.4 mmHg], not reported or unknown [n = 9]). Changes from baseline in A1C, BW, and SBP were assessed at Week 26. Safety was based on adverse event (AE) reports.
Results: Reductions in A1C, BW, and SBP were seen with CANA100/MET, CANA300/MET, CANA100 and CANA300 vs. MET in Latino/Hispanic and non-Latino/Hispanic patients at 26 weeks. Consistent with the higher baseline A1C, least squares (LS) mean changes in A1C were numerically larger in Latino/Hispanic patients (–1.91%, –1.89%, –1.49%, and –1.43% vs. –1.28%) vs. non-Latino/Hispanic patients (–1.72%, –1.75%, –1.34%, and –1.40% vs. –1.30%). Dose-related LS mean percent reductions in BW were seen in Latino/Hispanic patients (–2.8%, –4.0%, –1.9%, and –3.1% vs. –0.9%) and non-Latino/Hispanic patients (–3.8%, –4.3%, –3.5%, and –4.2% vs. –2.5%). Reductions in SBP were generally similar in Latino/Hispanic patients (–2.8, –2.1, –1.2, and –2.9 vs. –1.0 mmHg) and non-Latino/Hispanic patients (–1.9, –1.3, –2.7, and –2.3 vs. –0.4 mmHg). Overall AE incidence was 50%, 50%, 43%, 53%, and 44% in Latino/Hispanic patients and 38%, 41%, 34%, 36%, and 34% in non-Latino/Hispanic patients. Incidence of genital mycotic infections and osmotic diuresis, volume depletion, and renal-related AEs was low, but generally higher in all CANA arms vs. MET.
Conclusion: Initial combination therapy with CANA + MET provided improvements in A1C, BW, and SBP, and was generally well tolerated in both Latino/Hispanic and non-Latino/Hispanic patients with T2DM.

Abstract #1142

IMPROVING DIABETES MANAGEMENT BY RESIDENTS IN AN OUTPATIENT SETTING

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Objective: Annual screening for microvascular complications in patients with diabetes is recommended to decrease the rate of complications and improve patient satisfaction and outcomes. However, a busy internist may not be able to consistently follow guidelines unless education is provided and reinforced to target screening procedures. Additionally, frequent changes in rotations in a residency program, updated guidelines as well as an overwhelming amount of information to be learned and practiced may make it difficult for residents to practice optimum screening procedures in patients with diabetes.
We aimed to improve the quality of care for patients with diabetes in our ambulatory Internal Medicine setting in concordance with ADA guidelines.
Methods: This was a pre- /post-intervention quasi-experimental study with education sessions conducted one to two times a month in November to January of the academic year. The educational sessions covered the content of the ADA guidelines, strategies for screening

and viewing teaching videos on diabetic foot exam. Patient charts of visits at the Ambulatory clinic were reviewed before and after intervention over a period of 6 months. Electronic medical records of patients were reviewed by resident physicians to record data on screening tests including fasting blood sugar, glycated hemoglobin (HbA1c), urine microalbumin/creatinine ratio, LDL cholesterol levels, annual foot examination and annual ophthalmological examination.

Results: Pre intervention data from 104 patient charts was available, which was compared to post-intervention data available from 89 patient charts. HBA1 c testing showed an improvement of 0.7 %, Urine Microalbumin/Cr showed an improvement of 7.9%, lipid panel showed an improvement of 5.9%, eye exam showed 17.6% (p= 0.014) of improvement & foot exam showed an improvement of 23.4 % (p= 0.002).

Discussion: Since retinopathy and neuropathy are the most debilitating complications of long standing diabetes, increased screening and referral for annual exams for these in patients with diabetes by our residents was an important outcome for our project.

Conclusion: Targeted education of residents on guidelines can improve recommended screening in patients with diabetes to improve patient outcomes.

Abstract #1143

TEN YEARS RETROSPECTIVE MEDICAL RECORD REVIEW AND TELEPHONIC SURVEY TO ASSESS THE ASSOCIATION BETWEEN ARTIFICIAL SWEETENERS (AS) AND WELL DIFFERENTIATED THYROID CANCER (WDTC)

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Objective: Consumption of artificial sweeteners has increased in the USA and Europe. Critics of AS say that they cause a variety of health problems, including cancer. Studies have linked saccharin and cyclamates to bladder cancer in laboratory rats. However, no definitive studies are available in human beings. The National Cancer Institute's Surveillance Epidemiology and End Results (SEER) has reported an increase in the prevalence WDTC. The cause of this increase is not known.

As the incidence of AS consumption and thyroid cancer are both increasing, our study would focus on determining any possible association between them.

Methods: This retrospective study included a study group (Group-1) of 50 patients with age 18 years and above who have been diagnosed with WDTC between Jan 1, 2004 – Aug 31, 2014 in two city hospitals and a control group (Group-2) of randomly selected 50 patients with benign thyroid nodule diagnosed by fine needle aspiration during the same period. A telephonic survey was conducted in both groups after appropriate consent was obtained. The survey questionnaire was pertaining to the use of AS in their diet. Based on the data collected, a statistical analysis using binary logistic regression and proportionate test was conducted.

Results: In Group-1 we found that 38 out of 50 patients (76%) took AS while in Group-2 only 12 out of 50 patients (24%) took AS. In Group-1 patients consumed an average of 4 packets (4 grams) of AS daily for an average duration of 5 years. In Group-2 patients consumed an average of 2 packets (2 grams) of AS daily for an average duration of 5 years. An analysis done using binary logistic regression showed that the risk of having WDTC is 10 folds higher in AS users when compared to non users with odds ratio of 10.3 ($p<0.01$). A proportion test showed a statistically significant ($p < 0.01$) number of AS consumers in Group-1 than in Group-2 (76% vs 24% with $p < 0.01$).

Discussion: Aspartame, Sucralose and Saccharin, the main ingredients of AS are known to cause cancers in animals. A previous report suggested that AS can be associated with Hashimoto's thyroiditis [4]. It has been found in different studies that heavy AS (>1680mg/day) use leads to an increased relative risk of 1.3 for bladder cancer in humans. Based on the result of this study, an average intake of 4 packets of AS daily for an average duration of 5 years increases the risk of WDTC by 10 folds.

Conclusion: This study emphasizes the significance of AS consumption as a potential risk factor for WDTC and increase public awareness for it.

Abstract #1144

EXPERIMENTAL STUDY ON THE IMPACT OF MOLECULAR MARKER TESTS (AFIRMA AND THYROSEQ V2) ON PREDICTING MALIGNANCY IN INDETERMINATE THYROID NODULES: A FIVE-YEAR INSTITUTIONAL EXPERIENCE

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Objective: Indeterminate thyroid fine needle aspiration (FNA) cytology (Bethesda categories III and IV) creates uncertainty in diagnosis of malignancy in thyroid nodules. Prior to introduction of Molecular marker tests (MMT) such as Throseq v2 and Afirma, these patients were sent for thyroidectomy. This paper presents an experimental study of the performance of these tests in indeterminate nodules.

Methods: A retrospective study was performed on 1010

patients with FNA results in endocrine clinic at Queens Hospital Center over a five year period (Jan 2012-Dec 2016). We included 151 patients with indeterminate FNA cytology. Mutational panel and surgery results were analyzed whenever applicable. Malignancy rates, as well as percentage of benign MMT results that prevented thyroidectomy were calculated.

Results: Our study included a total of 151 patients (86% female, Mean Age 56.2, SD: 13.7) with indeterminate FNA cytology result: 85 without any MMT, 38 Thyroseq v2, 28 Afirma. From 85 patients with indeterminate FNA result and no MMT, 42 patients (49%) had thyroidectomy, which 9 (21%) were malignant and 33 (79%) were benign. From 38 patients who had Thyroseq v2 result 13 (42%) had positive mutational panel: 12 RAS and 1 BRAF mutation. 7 patients with positive Thyroseq v2 had thyroidectomy and 5 (71%) were malignant. On the other hand 3 of patients with negative Thyroseq v2 mutational panel had thyroidectomy due to suspicious growth and 2 had malignant pathology results. With the use of Thyroseq v2, 22 (57%) patients were saved from unnecessary thyroidectomy. From 28 patients who had Afirma result, 16(57%) had suspicious gene expression classifier result, and 11 had Thyroidectomy which 3 (27%) were malignant. With the use of Afirma, 15 Patients (53%) were saved from thyroidectomy. All the sample were independent of age and gender using Chi Square independence test (P value 1.00).

Discussion: With the use of MMTs, 37 (66%) patients out of 66 were saved from unnecessary thyroidectomy. 3 patients with negative Thyroseq v2 mutational panel had surgery due to increase in size of the nodule, and 2 found to be malignant. Due to a rather small sample size the paper cannot scientifically comment on the statistical accuracy of MMTs and relies primarily on the earlier literature on this subject.

Conclusion: Based on review of the literature, MMTs are very helpful in further analyzing indeterminate nodules and can help us prevent unnecessary surgeries due to their excellent negative and positive predicting values. However vigilance follow-up of these patients for growth of the nodule or other symptoms that may suggest possibility of malignancy is recommended.

Abstract #1145

AUTOMATED FREQUENT INSULIN DOSAGE TITRATIONS TO OVERCOME INSULIN THERAPY INEFFECTIVENESS

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Objective: Insulin therapy is used by a quarter of type 2 diabetes patients, yet most do not achieve glycemic goals. Unless dosage is frequently adjusted, variations in insulin requirements hamper its effectiveness. In reality, dosage adjustments are done sporadically due to providers' workload in caring for a large number of patients.

The d-Nav® Insulin Guidance Service has been developed to overcome this barrier. d-Nav is a handheld device that automatically analyzes stored glucose patterns and titrates insulin at least weekly, based on individual needs. The service includes care specialists who provide patients with support and clinical triage. We equipped a diabetes specialty team with the d-Nav Insulin Guidance System to assess its impact on insulin management of patients with type 2 diabetes.

Methods: We conducted a 6-month, multicenter, randomized-controlled trial with 181 sub-optimally controlled patients with type 2 diabetes. Standard care, which was delivered by a diabetes specialist team who contacted patients 7 times (control group), was compared to the same with the addition of d-Nav (d-Nav group).

Results: As of 02/28/2017, 96% of subjects completed the trial. Preliminary results showed that in the d-Nav group, A1c decreased by 1% from 8.7±0.8% to 7.7±1.0%, while in the control group A1c decreased by 0.3% from 8.5±0.8% to 8.2±0.9% ($p<0.0001$ between groups).

In the d-Nav group, clinically significant improvement in A1c (≥0.3%) was seen in 79.8% of subjects and 52.4% achieved A1c≤7.5%. Conversely, in the control group although 44.3% improved A1c≥0.3% only 20.3% achieved A1c≤7.5%. In nearly half of the control patients (43%), A1c worsened or was unchanged during the study compared to only 15.5% in the d-Nav group ($p<0.001$ compared to the other group).

Discussion: When equipped with automated insulin titration capabilities, a diabetes specialist team can deliver an effective insulin therapy to the majority of patients.

Conclusion: Automated insulin titration along with provider support can transform the standard of care in insulin users with Type 2 diabetes.

Abstract #1146

LINAGLIPTIN EXERTS AN ANTI-INFLAMMATORY AND INSULIN SIGNALING PROMOTING EFFECTS IN WELL CONTROLLED PATIENTS WITH TYPE 2 DIABETES

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Objective: We have previously shown an acute and a long term anti-inflammatory effect of sitagliptin, a DPP-IV inhibitor, in patients with type 2 diabetes. We have now investigated the potential anti-inflammatory effects of linagliptin in patients with well controlled type 2 diabetes.
Methods: Twenty-four patients with well-controlled type 2 diabetes were divided into 2 groups of 12 patients each. One group was treated with linagliptin 5 mg daily and the other was treated with placebo. Blood samples and adipose tissue biopsies were collected prior to and 12 weeks after treatment. Blood samples were also collected following a high fat high calorie (HFHC) meal administered before and after 12 weeks of treatment.
Results: At 12 weeks, HbA1c had fallen significantly from 6.8±0.2% to 6.5±0.2%. Reactive oxygen species (ROS) generation by polymorphonuclear cells (PMN) was significantly lower by 21±7%, plasma lipid peroxide levels measured as TBARS had fallen by 18±7% as had intranuclear NFκB binding by mononuclear cells (MNC) fell by 16±6% in fasting blood samples. The expression of IL-1β and JNK-1 in MNC had also diminished significantly by 29±7% and 24±10%, respectively at 12 weeks. In the adipose tissue, the expression of TNF-α and JNK-1 was significantly lower (by 24±10% and 26±12%, respectively) while that of insulin receptor, IRS-1 and GLUT-4 was significantly higher (by 41±18%, 57±16% and by 62±15%, respectively) in the fasting state following 12 weeks of treatment. Following the administration of a HFHC meal, ROS generation by PMN and MNC was diminished, as was the expression of JNK-1 in the linagliptin treated group in addition to a significantly diminished glucose excursion and a trend towards increased GLP-1 and insulin secretion.
Discussion: Our data show that linagliptin suppresses mediators of inflammation in both MNC and adipose tissue. Many of these inflammatory mediators are also involved in insulin resistance. Therefore, this anti-inflammatory effect of linagliptin may contribute to the observed improvement in expression of insulin signaling mediators in adipose tissue.
Conclusion: We conclude that linagliptin exerts anti-inflammatory and insulin signal transduction promoting effects even in well controlled patients with type 2 diabetes.

Abstract #1147

WHEN TRADITIONAL MEASURES ARE NOT SUFFICIENT TO MANAGE THE SEVERE METABOLIC DISTURBANCES IN PATIENTS WITH LIPODYSTROPHY SYNDROME, WHAT IS NEXT?

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Case Presentation: The Lipodystrophy Syndromes are unusual genetic or acquired disorders involving loss of adipose tissue, often accompanied by hypertriglyceridemia and diabetes mellitus. Serum leptin levels are markedly reduced in patients with lipodystrophy.
This is a case of an 18-years-old female patient who presented to the emergency department with a 2-day history of nausea, vomiting, severe epigastric and left upper quadrant pain. Laboratory from admission showed elevated anion gap, hyperglycemia, triglyceridemia, high lipase and amylase. The patient was admitted due to hypertriglyceridemia induced acute pancreatitis associated with diabetic ketoacidosis. She was treated with metreleptin in combination with insulin infusion having an effective resolution of the symptoms.
For the last 5 years, the patient has had severe metabolic disturbances, including insulin resistance and hypertriglyceridemia. She received traditional glucose and lipid lowering therapy without success and has developed associated complications as recurrent hypertriglyceridemia induced acute pancreatitis. When she was 13 -years-old, the patient was evaluated for genetic disorders of lipid metabolism. Genetic testing revealed the diagnosis of Familial Partial Lipodystrophy. At that time, her pediatric endocrinologist suggested to participate in the NIH lipodystrophy research for leptin replacement. She started to receive leptin therapy, and a marked reduction in serum triglycerides and glucose levels were observed.
Conclusion: While some patients with lipodystrophy can be effectively managed with traditional therapies, these measures are not effective in many others with severe metabolic disturbances. Nowadays, Leptin therapy has been proven as a useful next treatment for patients with severe insulin resistance and hypertriglyceridemia. In this case a young female patient for whom the conventional measures to treat hypertriglyceridemia and hyperglycemia were not sufficient. After her presentation in the ER, standard treatment failed to improve triglycerides and pancreatic acute inflammation. Triglycerides levels peaked at 4,304 mg/dL. After 5 days of starting her on metreleptin

regimen in combination with insulin infusion her pancreatitis symptoms cleared and the triglycerides levels went down to 500 mg/dL. Due to the few cases of patients with Lipodystrophy Syndrome using this new alternative therapy, this case represents a great chance to know more about Leptin and its dramatic metabolic benefits.

Abstract #1148

IPILIMUMAB: EVERY GOOD THERAPY HAS ITS DARK SIDE!

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Case Presentation: 79 y/o male with a history of a left chest wall skin lesion diagnosed in May 2010. Lesion was biopsied on June of the same year at an outside institution and found to be stage IV Melanoma, later removed that same month. In 2012, he noticed small masses around left flank. On June 2013 after patient moved to Florida he presented to our institution for further evaluation. PET/CT was done showing uptake in the axilla and abdominal wall, biopsy confirmed melanoma. Patient underwent targeted therapy trials with Ipilimumab (Ipi) followed by monoclonal antibodies directed against PD-1 (PD-1 Ab).
Patient referred to Endocrine Tumor Clinic for evaluation of fatigue, cognitive impairment and the following labs: TSH 0.204 (L), FT4 0.48 (L) ACTH <5 (L), Cortisol 5.8, and Testosterone 9 (L). MRI of the sella did not show any abnormal findings. He was started on low-dose hydrocortisone and gradually increased to 15mg in the morning and 10 mg at night. Thyroid replacement was also initiated. Testosterone levels were low however replacement therapy was not given due to elevated PSA.
This patient was diagnosed with hypophysitis secondary to ipilimumab therapy. Ipilimumab was FDA approved in 2011 for unresectable or metastatic melanoma. Ipi is a fully humanized monoclonal antibody that blocks cytotoxic T-lymphocyte antigen-4 (CTLA-4), an inhibitory molecule expressed on antigen-stimulated T cells, and thereby enhances T-cell activation. Multiple endocrine abnormalities including hypophysitis has been described in patients on Ipilimumab.
Conclusion: Raising awareness of medication induced endocrine side effects in highly important in this era of monoclonal therapy. Recognition of these side effects plays a key role in early detection and proper management.

Abstract #1149

EFFECTIVENESS OF TRASSPHENOIDAL SURGERY IN PATIENTS WITH CUSHING'S SYNDROME IN REPUBLIC OF UZBEKISTAN

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Objective: To evaluate effectiveness of pituitary transsphenoidal surgery (TSS) in patients with ACTH-dependent Cushing's syndrome (ACTH-DCS) in Republic of Uzbekistan (RUZ).
Methods: Patients who included in CS register monitored in 2015. All data from 2000 to 2015 analyzed including outpatient, inpatient examines, tests and treatment. To present, 158 patients with ACTH-DCS registered and monitored. Of these 158 patients, 41 males (26%) and 117 females (74%). Mean age of patient varied from 12 to 38 years-old. Mean age was 26.38±3.4 and 27.58 ± 3.4 years old for males and females respectively. Duration of the condition varied from 4 months to 25 years. 73 patients who had TSS were evaluated in 1, 3, 6 and 12 months period of time and the every 3 months for the follow-up period. TSS was performed initially in 73 patients and in 10 patients it was carried out after medical treatment.
Results: Of 158 patients, 86 patients (54%) had surgery including 73 cases who underwent TSS. Pituitary surgery performed as a monotherapy in 32 patients (44%) and in 41 cases (56%) patients received combination therapy. Of 73 patients who underwent TSS, in 60 cases (82%) patients had cured, while repeat surgery performed in 10 cases (13.7%). After repeat surgery all 10 patients (13.7%) had remission, however, 4 of them relapsed in 15 months in average. After TSS remission was achieved in 82% of patients who included 62 patients with microadenomas (84.9%) and 12 cases with macroadenimas (16.6%). After 3 years of follow-up 5 patients (6.8%) who had total hypophisisectomy procedure developed no relapse, whereas of 62 patients (84.9%) with selective adenomectomy and of 6 patients (6.8%) who had hemihypophysisectomy recurrent disease observed in 5 (8.1%) and 1 (16.7%) cases respectively while remission has not developed in 6 (9.7%) and 1 (16.7%) respectively (p=0.03).
Conclusion: Of 73 patients with CS who had pituitary surgery, remission observed in 60 patients (82%), whereas six patients (8.2%) relapsed and in seven cases (9.6%) remission has not developed. TSS remains as first treatment choice in CS and contributes to a steady remission in 82% according to our results.

Abstract #1150

A SURVEY FOR DIFFERENT APPROACHES IN THE DIAGNOSIS AND TREATMENT OF PCOS AMONG ADULT AND PEDIATRIC ENDOCRINOLOGISTS

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Objective: Polycystic ovary syndrome (PCOS) is the most common cause of a infertility with a prevalence of 5-10 % in women of reproductive age. There is evidence for differences between adult and pediatric endocrinologists and other specialists in their approach in the diagnosis and management of PCOS.
Methods: A survey consisting of 37 questions was distributed among adult and pediatric endocrinologists, aiming to understand the current practice for diagnosis and management of PCOS. A total of 100 responses were available for final analysis; 36 % from adult endocrinologists(AE) and 64 % from pediatric endocrinologists(PE).
Results: Majority (64%) of respondents to the survey were endocrinologists from a multispecialty group. For both adults and adolescents with PCOS ,the most common reported presenting symptoms were menstrual irregularities ,obesity and hirsutism . The most common features used for diagnostic criteria were clinical or biochemical hyperandrogenism and ovulatory dysfunction. Most AE and PE screened for PCOS with total testosterone (83%) and free Testosterone (71%), screening for prolactin excess in 70 % and congenital adrenal hyperplasia (83 %) . 66 % of AE will obtain pelvic US for evaluation vs 45 % of PE. Only 20 % of all respondents will obtain a midluteal progesterone for documentation of anovulation. In terms of treatment of hyperandrogenism and menstrual irregularities in adolescents; the most common form used is oral contraceptives pills followed by metformin then spironolactone. A similar approach was used in adults however the use of spironolactone was higher 53 % vs 21 % in adolescents. Most common modality used for infertility was lifestyle interventions followed by metformin and clomiphene citrate.
Screening of OSA and depression was not done by most of the endocrinologists (never + sometimes) 72 % and 76 % respectively. Though screening for diabetes/metabolic syndrome and insulin resistance was done by most of the endocrinologists (always +often) 95 and 68 % respectively.
Discussion: There are multiple diagnostic criterias used for PCOS diagnosis, however given the wide variation in presentation and approach to diagnosis in adults and adolescents , there has not been a consensus on which is the gold standard criteria.
Conclusion: Our survey showed the most common trends of diagnosing and treating PCOS among adult and pediatric endocrinologists .Further studies and trials need to be conducted to compare different treatment modalities used for hyperandrogenism,menstrual irregularities and infertility as PCOS if not treated earlier can lead to long term complications.

Abstract #1151

LOWER RISK OF HYPOGLYCEMIA AND LESS HEALTH CARE UTILIZATION IN BASAL INSULIN-TREATED PATIENTS WITH TYPE 2 DIABETES (T2D) AFTER SWITCHING TO INSULIN GLARGINE 300 UNITS/ML (GLA-300) VS OTHER BASAL INSULINS IN REAL-WORLD CLINICAL SETTINGS

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Objective: The aim of this study was to evaluate clinical outcomes and health care utilization (HCU) of patients with T2D using basal insulin (BI) who switched to either GLA-300 or other BI (O-BI) in real-world settings.
Methods: The DELIVER2 retrospective observational study used data from the Predictive Health Intelligence Environment database of electronic medical records representing 37 integrated delivery networks. Included patients: were adults with T2D using BI; had baseline data for 12 months (m) before switching to either GLA-300 or O-BI from insulin glargine 100 units/mL or insulin detemir (index date [Dx]: first BI switch from Mar 1, 2015 to May 31, 2016); were followed for 6 m after Dx; had baseline and follow-up (>90 days after Dx) A1C measures. Final number of included patients was 2185 for GLA-300 and 3921 for O-BI. Patients on GLA-300 and O-BI were matched 1:1 on a propensity score (PS) based on baseline demographics and clinical characteristics. The endpoints were A1C change from baseline, incidence and event rate of hypoglycemia (hypo) (identified by ICD-9/ICD-10 and/or plasma glucose level≤70 mg/dL), and HCU (incidence and event rate of all-cause, diabetes-, and hypo-related visits) during 6 m follow-up.
Results: After PS matching, each group comprised 1827 patients. Mean baseline A1C was 8.95% for GLA-300 and 8.93% for O-BI. A1C decreased significantly to

8.40% and 8.46%, respectively, during 6 m follow-up (comparable reduction in both groups: −0.55% for GLA-300 vs −0.47% for O-BI; P=0.14). During 6 m follow-up, fewer patients on GLA-300 experienced hypo vs those on O-BI (15.9% vs 18.2%, respectively; P=0.01). Adjusted for baseline hypo, switching to GLA-300 was associated with fewer hypo events at 6 m (least squares means [LSM] difference: 0.23 events/per patient per year [E/PPPY], P<0.01). Patients on GLA-300 had a lower risk of requiring all-cause inpatient and emergency room (ER) service vs O-BI at 6 m follow-up (adjusted odds ratio: inpatient 0.76 [0.63-0.93], P=0.01; ER 0.77 [0.66-0.91], P<0.01). Patients on GLA-300 had fewer all-cause ER and outpatient events (LSM difference: ER 0.18 E/PPPY, P=0.01; outpatient 0.99 E/PPPY, P<0.01). Similarly, the outcomes of diabetes- and hypo-related HCU were favorable for GLA-300.

Discussion: Switching to GLA-300 was associated with lower hypo risk vs switching to O-BI. This translated into a lower incidence of inpatient and ER visit, and fewer events of all-cause and diabetes-related outpatient services.

Conclusion: This real-world study supports the effectiveness of GLA-300 in reducing risk of hypo and HCU while achieving similar A1C control vs O-BI for patients with T2D.

Abstract #1152

SEVERE INSULIN RESISTANCE IN A PATIENT WITH ACUTE PROMYELOCYTIC LEUKEMIA TREATED WITH ARSENIC AND GLUCOCORTICOIDS

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Objective: To present a case of severe insulin resistance in a patient with acute promyleocytic leukemia (APML) treated with arsenic and glucocorticoids.

Case Presentation: A 32-year-old male with type 2 diabetes and a hemoglobin A1c (HgA1c) of 5.8% on no medications presented to the hospital with thrombocytopenia on outpatient labs. Diabetes was diagnosed two years ago with an HgA1c of 12.1%, while periodically taking steroids for migraines and back pain. He reported recent bruising, epistaxis, bleeding gums and night sweats. A blood smear confirmed a diagnosis of APML. Treatment for APML was started with all-trans retinoic acid (ATRA), arsenic and dexamethasone. By day three of treatment his blood glucose was greater than 400 mg/dL with labs consistent with diabetic ketoacidosis (DKA). An insulin drip was started with requirements up to 999 units/hr on day three of treatment. The patient's blood glucose remained 350-400 mg/dL during this time with persistent DKA. Insulin was concentrated to 4 units/mL on day four and peaked at a rate of 600 units/hr on day five (2400 units/hr at standard concentration) before blood glucose trended down and DKA resolved. Arsenic treatment was given for ten days and dexamethasone was tapered over a total of seven days. The insulin infusion was discontinued after ten days. He was discharged on 15 units of basal insulin and 3 units of bolus insulin with meals.

Discussion: Glucocorticoids cause hyperglycemia and insulin resistance by complex mechanisms involving genomic and non-genomic pathways in beta-cells, hepatocytes, adipocytes, and skeletal muscle. While glucocorticoids are a well known cause of hyperglycemia, the degree of insulin resistance was extreme, with requirements of insulin per hour that have rarely been reported. Arsenic may also have been a major contributor to the severe insulin resistance. Arsenic has been shown to cause beta-cell dysfunction and insulin resistance in mice. The mechanism likely involves interference with transcription factors involved in insulin-related gene expression. Studies have also shown increased prevalence of diabetes in areas with relatively high levels of arsenic in the drinking water. While chronic exposure to arsenic has been associated with higher rates of diabetes, acute insulin resistance and rates of diabetes after short-duration and high-dose exposure to arsenic has not been comprehensively studied.

Conclusion: The combination of high-dose glucocorticoids and arsenic induced a state of severe insulin resistance in this patient with a new diagnosis of APML. More research is needed on the effects of chronic and acute arsenic exposure with regard to its impact on insulin resistance and the development of diabetes.

Abstract #1153

BONE ASSESMENT IN MENOPAUSAL WOMEN WITH NON-HYPERTHYROIDISM RELATED BENIGN THYROID CONDITIONS ADMITTED AT TWO TERTIARY CENTERES OF ENDOCRINOLOGY

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Objective: Thyroid disorders may overlap with menopause-related bone loss or be a contributor of it because of transitory iatrogenic thyrotoxicosis on patients with chronic Hashimoto thyroiditis- (HT) or nodular goiter (MG)- related hypothyroidism or short episodes of HT

flare-up. We analyze bone features on patients admitted for thyroid evaluation.

Methods: Cross-sectional non-interventional study, between 2013 and 2017, at two tertiary centers of endocrinology; patients were confirmed with Thyroid pathology as HT or MG (regardless if they experienced transitory episodes of thyreotoxicosis due to overtreatment for hypothyroidism or HT flare-up), described as "criteria T". Inclusion criteria: menopause-related secondary amenorrhea since the last 5 years. Exclusion criteria: confirmed increased thyroid function or thyroid cancer at any moment, prior bone pathology diagnosis or specific anti-osteoporotic drugs exposure. DXA (Dual-Energy X-ray Absorptiometry, GE Lunar) was done. Statistical tests (Mann-Whitney U Test) are based on SPSS17; statistical significance at $p<0.5$.

Results: 157 patients were in group A (N=115) with positive criteria T and group B (N=42) with negative criteria T (control group). Age (47.1+/-4.9vs.46.1+/-4.6years), years since menopause (14.2+/-9vs.14.6+/-8.6) were not SS different. Body Mass Index was adjusted at bone profile analysis (27.5vs.29.7kg/sqm,$p<0.5$). TSH (Thyroid Stimulating Hormone) of 2.6+/-2.8vs.1.76+/-1μU/mL), Antithyroperoxidase antibodies of 109.63+/-51.54 (ranges:5.4-1000UI/mL)vs.22.11+/-28.11UI/mL (Normal<35UI/mL) were not SS different. Lumbar Bone Mineral Density (BMD) was similar (1.021vs.1.032g/sqcm), as total/ionic serum calcium (9.53/4.1vs.9.59/4.2mg/dL). Group A: 21.7%-osteoporosis, 40.9%-osteopenia, 37.4%-normal DXA. Circulating bone formation markers were SS higher in group A: osteocalcin (25.73vs.15.66 ng/mL,p=0.005), P1NP (56vs.41.22 ng/mL,p=0.051) but not bone resorption marker CrossLaps (p=0.35). 25-hydroxyvitamin D was lower in group B (15.12 vs. 20.13 ng/mL;p=0.012), without 98 parathormone SS changes between the groups. Only 11% rs. 4.5% of patients from group A rs. B had an optimal level(≥30ng/mL).

Discussion: As limits we mention the fact that TSH analysis was cross-sectional regardless history variation over the time and no correlation TSH-bone parameters was relevant.

Conclusion: Based on our observations, menopausal patients from group A with benign thyroid conditions without hyperthyroidism, regardless they had normal thyroid function or treated hypothyroidism (with potential overtreatment episodes) have higher bone formation markers and 25-hydroxivitamin D but similar lumbar BMD.

Abstract #1154

THYROID STIMULATING HORMONE-SECRETING PITUITARY ADENOMA PRESENTATING WITH TACHYARRHYTHMIA

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Objective: Thyroid stimulating hormone-secreting pituitary tumor (TSHoma) is a rare cause of hyperthyroidism, accounting for less than 2% of all pituitary adenomas. Atrial fibrillation (AF) is uncommon in these patients and even rare to have AF as a presenting symptom. There are only a few cases of TSHoma reported who presented with AF as an initial manifestation.

Case Presentation: A 49-year-old female presented to an emergency room (ER) with intermittent atypical chest pain. In ER she had an episode of nonsustained ventricular tachycardia (NSVT) with heart rate (HR) of 86/min. She had no previous cardiac disease. She reported weight loss of 20 Ibs over 3 months and had expressive galactorrhea for the last 25 years. She had no family history of AF or thyroid disease. She had no other symptoms or signs of thyrotoxicosis. There was no orbitopathy, visual field defect or goiter. On telemetry she had an episode of AF with HR 150/min that converted to sinus rhythm with diltiazem. She always remained hemodynamically stable with no further episodes. Echocardiogram, cardiac angiogram and cardiac MRI were unremarkable. Serum lab results showed: TSH 16.70 uIU/ml (0.36-4.50), Free T4 1.72 ng/dl (0.86 -1.52), Free T3 4.7 pg/ml (2.0-4.4); anti-thyroid peroxidase antibody and thyroid stimulating immunoglobulin were negative. Magnetic resonance imaging(MRI) showed a suprasellar macroadenoma measuring 2.2 cm with cavernous sinus invasion. She had elevated serum prolactin 84.9 ng/ml (0.7 -31.5) and serum alpha-subunit 9.9 ng/ml (<2.34). Serum insulin-like growth factor-1 was 93 ng/ml (57-195), FSH 6.1 mIU/ml, LH 3.1 mIU/ml, estradiol <11 pg/ml. Diagnosis of TSHoma was made with possible cosecretion of prolactin. Octreotide and methimazole were started. Initially, the patient declined surgical resection. After 3 months, repeat MRI showed that no significant change in tumor size. Serum free T4 and free T3 normalized while TSH remained elevated (11.50 uIU/ml). She did not have any further arrhythmic episodes. Patient eventually agreed for surgical resection which is now planned.

Discussion: We present a rare case of TSHoma where initial presentation was atrial fibrillation with no symptoms or signs of thyrotoxicosis except weight loss. Our patient also

had NSVT. She normalized her serum T4 and T3 secondary to use of methimazole. However, tumor size and TSH did not respond to octreotide. Resistance to octreotide treatment may be due to somatostatin receptor heterogeneity.
Conclusion: It is important to assess thyroid function in all cases of atrial fibrillation. The evaluation should consist of estimating free T4 in addition to TSH, as screening with TSH alone will miss the diagnosis of TSHoma as an etiology for AF.

Abstract #1155

PHEOCHROMOCYTOMA AS A REVERSIBLE CAUSE OF CARDIOMYOPATHY: ANALYSIS AND REVIEW OF THE LITERATURE

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Objective: Pheochromocytoma and paraganglioma are rare catecholamine producing tumors of the adrenal gland or extra-adrenal chromaffin cells of the sympathetic and parasympathetic ganglia. Excessive catecholamine-induced stimulation of cardiac myocytes may lead to extensive myocardial fibrosis and cardiomyopathy. The diagnosis of pheochromocytoma-related cardiomyopathies may be delayed due to their atypical presentation.
Methods: A review of the literature in PubMed (1991-2016) was performed using the search terms "pheochromocytoma" and "dilated cardiomyopathy", pheochromocytoma" and "Takotsubo cardiomyopathy", and "pheochromocytoma" and "cardiomyopathy".
Case Presentation: Of 150 articles, there were 164 cases of pheochromocytoma and cardiomyopathy (63 dilated, 39 Takotsubo, 30 inverted Takotsubo, 10 hypertrophic, 8 myocarditis, and 14 unspecified cardiomyopathy). Age was 44.3 ±14.9 years with a female predominance of 57%. By definition of cardiomyopathy, the mean LVEF was 26 ±14%. Patients often lacked classic signs of pheochromocytoma with hypertension as a presenting symptom in 64% and the triad of headache, palpitations, and diaphoresis in only 5%. Resection led to improvement of the cardiomyopathy in 96% while lack of resection was associated with death or cardiac transplantation in 44%.
Discussion: Pheochromocytoma and paraganglioma are rare and patients are typically screened only in the presence of characteristic symptoms. This study expands the knowledge of pheochromocytoma-induced cardiomyopathies. First, it is shown that patients may lack the classical symptoms to suggest catecholamine excess syndrome. Second, we expand the diagnostic considerations of pheochromocytoma-associated cardiomyopathies to include Takotsubo and inverted Takotsubo variants, but also dilated and hypertrophic cardiomyopathies, and myocarditis. These results emphasize the need to evaluate patients with non- ischemic non valvular cardiomyopathy for pheochromocytoma even in the absence of signs of catecholamine excess. This is especially important given that resection of the pheochromocytoma leads to improvement, while delay or lack of resection is associated with death or cardiac transplantation.
Conclusion: Pheochromocytoma should be considered in the evaluation of non-ischemic, non-valvular cardiomyopathy even in the absence of typical symptoms of catecholamine excess.

Abstract #1156

FLASH GLUCOSE MONITORING AS AN EFFECTIVE ENABLER TO IMPLEMENT LIFESTYLE INTERVENTION IN DIFFICULT TO TREAT TYPE 2 DIABETES PATIENTS

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Objective: FreeStyle Libre Pro (TM), a Flash Glucose Monitoring (FGM) system has recently been marketed in India and is used to complement self-monitoring of blood glucose. Current treatment guidelines support the role of lifestyle modification, to achieve target glycemia in patients with type 2 diabetes mellitus (T2DM). The customised lifestyle intervention as early as one week of glucose monitoring through patient empowerment may boost the glycemic control.
Methods: In a cluster of 45 patients, on FGM system for 14 days, during the period from September 2016 - Februray 2017, we followed a clinical decision support mechanism to identify the eleven distinct patients who were difficult to treat (either with persistent hyperglycemia, reported hypoglycaemia, or diabetes related complications) for effectiveness analysis of the early lifestyle intervention at seven days of glucose monitoring. The patient driven lifestyle was intervened at seventh day to implement a precise physician led customised lifestyle intervention program for next seven days, without any modulation in the ongoing anti-diabetic agents. Mann-Whitney and Unpaired t test was used for statistical analysis.
Results: The commonest clinical challenging scenarios were, nocturnal hypoglycaemia (n=4), post breakfast hyperglycemia (n=2) and persistent hyperglycemia (n=2). The mean estimated HbA1c values were 9.15% (minimum 5.7 %, maximum 16.3% , 95% CI 7.2,11). The mean daily no. of hours spent in hyperglycaemia was 5.8 hours (26.51% of the total time). The difference between the

Average Glucose (AG) of first initial phase (patient driven) 226 mg/dl Vs the last seven days (physician led) 204 mg/dl was 22 mg/dl (decrease of 9.7%) The maximum reduction in AG after seven days of lifestyle intervention was 59 mg/dl (95% CI -39.06, - 5.22) (p=0.52). The mean % time in target was 4.3 hours (95% CI -2.65, 11.32; p=0.77). The mean difference in the % time below target (initial Vs last phase) was 3.04 % (p=0.52. 95% CI -4.56,10.47) and the mean difference in the % time above the target was 7.1% (p=0.52, 95% CI 32.49, 19.66)

Discussion: The implementation of the guideline directed lifestyle management, even in difficult to treat patients, is feasible through sensitisation to the patient to adopt healthy lifestyle is reemphasised in the real world setting. FGM through FreeStyle Libre Pro (TM) is an important tool to empower the physician to enable to provide the snapshot of the glucose monitoring to the patients to enable a customised lifestyle intervention.

Conclusion: Flash glucose monitoring enables lifestyle management - a difficult prescription to be followed, be adopted with relative ease, even in patients with difficult to control diabetes.

Abstract #1157

DOES LIOTHYRONINE AFFECT BMI? A RETROSPECTIVE STUDY COMPARING BMI OF PATIENTS WITH HYPOTHYROIDISM TREATED WITH LEVOTHYROXINE ALONE VERSUS THOSE TREATED WITH THE COMBINATION OF LEVOTHYROXINE AND LIOTHYRONINE

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Objective: The recommended treatment for primary hypothyroidism is levothyroxine replacement to achieve a thyroid-stimulating hormone (TSH) level within the normal range, (0.45-4.5 mIU/L). While a recent study from our institution revealed no weight benefit of maintaining TSH in the lower half of the normal range, there is limited information on the benefit of combined liothyronine (T3) and levothyroxine (T4) with regards to weight. Our hypothesis is that there is no difference in BMI between patients treated with levothyroxine alone verses levothyroxine and liothyronine.

Methods: We conducted a retrospective analysis at the Cooper Health System and Kennedy Health System from January 1, 2016 to December 31, 2016 of patients with hypothyroidism treated with T3+T4 or T4 alone. After applying exclusion criteria, a total of 73 patients treated with T3+T4 were compared to 82 patients treated with T4 alone. Data collected included age, sex, race/ethnicity, height, weight, TSH, BMI, T4 dose, T3 dose, as well as diabetes and smoking history. The data was analyzed using Fisher's exact test and Wilcoxon signed-rank test.

Results: There were more female, Caucasian, non-smoker and non-diabetic patients in both the T3+T4 treated group and the T4 treated group. Both groups were comparable in mean age and weekly T4 dose. Mean BMI in T4+T3 group was slightly lower (29.92 kg/m2) as compared to mean BMI in the T4 only group (32.16 kg/m2) though this difference was not significant (P = 0.13). The average TSH was 2.38 in the T4 group compared to 1.77 in the T4+T3 group. There was no statistically significant difference in BMI noted in hypothyroid patients treated with T3+T4 combination therapy as compared to T4 treatment alone.

Conclusion: Our results are consistent with other studies which have shown no benefit in body weight with combination T4+T3 therapy compared to T4 treatment alone. This study suggests that there is likely no benefit in terms of weight management of adding T3 to T4 therapy. Larger studies would be beneficial to confirm this conclusion.

Abstract #1158

PREDICTABILITY OF DIABETES MELLITUS TYPE 2 REMISSION AND CHANGES IN METABOLIC PROFILE AFTER BARIATRIC SURGERY USING DIAREM SCORING SYSTEM

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Objective: To predict Diabetes Mellitus (DM) type 2 remission following bariatric surgery and changes in systolic (SBP) and diastolic (DBP) blood pressure, total cholesterol (TC), low density lipoprotein (LDL), high density lipoprotein (HDL) and triglycerides (TG) using DiaRem (Age, insulin use, hemoglobin A1c and diabetes medications at the time of surgery) scoring system.

Methods: Patients with DM type 2 underwent bariatric surgery were reviewed. Data including age, sex, weight, type of bariatric surgery, SBP and DBP, blood pressure, TC, TG, HDL, LDL and hemoglobin a1c (Hgba1c) at baseline and 1 year after surgery was extracted. Complete and partial remission of DM type 2 was defined as hemoglobin a1c < 6.0% and between 6.0 - 6.5% at 1 year of surgery respectively. Data was then categorized into five subsets according to DiaRem scoring system (0-2, 3-7, 8-12, 13-17, 18-22). Chi-square test to determine the

difference in DM remission among subsets of DiaRem groups and Analysis of Variance (ANOVA) to determine the differences in metabolic parameters was used.

Results: 95 patient's Hgba1c was available at 1 year following surgery. Mean age was 48.2+/-9.56 years, 72.4% were women, 76% underwent Roux en Y gastric bypass, baseline weight was 134.44+/-30.18 kg, SBP was 132+/-17 mmHg, DBP was 80+/-11.3 mmHg, DM type 2 duration was 72.4+/-64.2 months, TC was 181+/-48 mg/dL, HDL was 41.1+/-9.64 mg/dL, LDL was 108+/-36 mg/dL, triglycerides was 163+/-90 mg/dL, Hgba1c ranged 5.2 - 12.1% with average of 7.48%, basal insulin use was 63.3+/-43 U daily and bolus insulin use was 44+/-27.44 U daily. Patients with higher DiaRem scores were less likely to achieve DM type 2 remission (100%, 83%, 64.2%, 59.2% and 16.6% respectively). DiaRem scoring system was strongly predictive of combined (complete and partial) DM type 2 remission (p-value: < 0.001) and complete remission (p-value: < 0.001) where as it was not predictive for metabolic parameters including SBP, DBP, TC, LDL, HDL and TG (p-values:0.14, 0.34, 0.8, 0.5, 0.61, 0.89 respectively).

Discussion: Obesity increases the risk of DM type 2 among other complications. Bariatric surgery have proven to be effective in sustained weight loss and glycemic control. Bariatric surgery is associated with complications, significant costs and not all patients derive equal benefit. Therefore patients with high benefit potential should be selected. DiaRem scoring system predicts the remission of DM type 2 and should be used to select patients for surgery.

Conclusion: We demonstrated that the DiaRem scoring system predicts DM type 2 remission at 1 year following bariatric surgery. Further studies should assess the predictability of such scoring system for longer term DM remission.

Abstract #1159

BODY MASS INDEX AND BONE MINERAL DENSITY ON TYPE 2 DIABETIC POSTMENOPAUSAL WOMEN

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Objective: Obesity, characteristic of type 2 diabetes, is associated with increased bone mineral density by loading effect. However, recent data showed the presence of bone microarchitecture deterioration, through multiple effects of hyperglycemia or accumulation of advanced glycation end-products (AGEs), like osteoblasts apoptosis and decoupling of bone turn-over.

Evaluation of bone profile in postmenopausal women with type 2 diabetes (2DM) compared to non-diabetic patients.

Methods: We conducted a cross-sectional study in a Tertiary Endocrine Center, East Europe on postmenopausal women without known prior bone pathology or anti-osteoporotic drugs exposure. We evaluated BMD (Bone Mineral Density) in the lumbar spine and femoral neck (GE Lunar), the anthropometric data (BMI:Body Mass Index), biochemical parameters and bone markers (CrossLaps-bone resorption marker, osteocalcin-bone formation marker). For statistical analysis we used Student's t-test and Spearman correlation (statistical significance at $p<0.05$).

Results: Were enrolled 24 patients with 2DM (64.83+/-8.3years) and 36 control patients without 2DM (60.13+/-9.6years). In the 2DM group, BMI was higher ($p=0.034$), 50% of women having a BMI: 30-37 kg/sqm, versus 22.85% in control group. There was a positive correlation between BMI and the lumbar BMD ($r=0.608$, $p < 0.05$) in both groups and in all BMI categories: $r=0.655$, $p< 0.05$ in normal weight patients; $r= 0.741$, $p<0.05$ in overweight patients; and $r= 0.278$, $p=0.10$ in the group with BMI: 30-37 kg/sqm. Osteocalcin levels were lower in 2DM patients ($p= 0.003$), showing a negative correlation with glucose levels ($r= -0.452$, $p=0.002$)

Conclusion: Type 2 diabetes did not affects the positive correlation between BMI and bone mineral density among normal weight and overweight patients (borderline significance in patients with obesity). Glucose level was significantly negatively correlated with osteocalcin level in patients with 2DM.