Conclusions: Men with the lowest FT and highest FSH levels have an increased mortality risk. Sexual symptoms, in particular erectile dysfunction, predict all-cause mortality independently of T levels. As both vascular disease and low T can influence erectile function, sexual symptoms can be an early sign for increased cardiovascular risk and mortality, as well as a sequela of low T.

Neuroendocrinology and Pituitary

PITUITARY TUMORS II

Giant Growth Hormone Secreting Pituitary Adenomas: A Single Institution Case Series

Bahadir Koylu, MD, Suleyman Nahit Sendur, MD, Seda Hanife Oguz, MD, Selcuk Dagdelen, MD, Tomris A Erbas, MD.
Hacettepe University Medical School, Ankara, Turkey.

MON-303

The prevalence of growth hormone (GH)-secreting pituitary adenoma is around 11-13% of all pituitary adenomas. Giant GH-secreting pituitary adenomas (≥ 4 cm) are rare tumors, and its prevalence of among acromegalic patients is <5%.

This is a retrospective cohort study including patients with giant GH-secreting pituitary adenomas. The study population consisted of 10 patients (5 M/5 F). The mean age at diagnosis was 33.0±12.9 yrs (11-55 yrs). The mean delay between first symptom onset and diagnosis was 2.9 years. The most frequent symptoms were acral enlargement and facial changes (80%), followed by headache (70%) and visual deterioration (50%). One patient had epilepsy. Amenorrhea was presented in three females but obvious galactorrhea in two. The mean adenoma diameter was 42.6±4.7 mm (40-51 mm) at diagnosis. The vast majority of adenomas presented suprasellar extension (100%) or cavernous sinus invasion (80%). Cystic adenomas accounted for 50%. At presentation, mean GH and IGF-1 levels were 40.0±21.4 ng/mL (14.8-51.0) and 2.62±1.09 x ULN (1.08-3.96), respectively. Six patients presented with PRL cosecretion. At diagnosis maximal tumor diameter was not correlated with GH or IGF-1 levels.

All patients underwent pituitary surgery as first-line treatment. Three cases were treated with an endoscopic approach and four cases with a microscopic approach. Transcranial approach was also employed in three cases. Postoperative mean GH and IGF-1 levels were 14.9±16.1 ng/mL (0.6-51.0) and 2.25.±0.82 x ULN (1.48-3.74), respectively. After first surgery, only one patient had more than 50% reduction in IGF-1 levels. Five patients (50%) underwent repeat surgery on two to three procedures because remission was not achieved. Postoperative somatostatin receptor ligands (SRLs) were used by all patients. Six patients were treated with dopamine agonist in combination with SRL. Six patients (60%) received postoperative radiotherapy.

The mean follow-up period was 12.6±5.3 yrs (4-21 yrs). The mean GH and IGF-1 levels were 1.47±1.54 ng/mL (0.08-5.25) and 0.73±0.44 x ULN (0.08-1.56), respectively at the last visit. Residual adenoma was present at the last MRI in eight patients (mean diameter 9.0±3.6 mm). Panhypopituitarism rose from 10% at baseline to 30% at the last visit. During follow-up, one patient diagnosed breast cancer, while another diagnosed thyroid papillary cancer.

Giant GH-secreting pituitary adenomas can have a clinically aggressive behavior with mass effect. Moreover, treatment in patients with giant GH-secreting pituitary adenoma is complex and multimodal therapy is necessary.

Cardiovascular Endocrinology

PATHOPHYSIOLOGY OF CARDIOMETABOLIC DISEASE

Use of PCSK9 Inhibitors Post-Transplant

Juliana Matthews, MD, Dustin Donald, PharmD, Barbara Gisella Carranza-Leon, MD.
Vanderbilt Univ Medical Center, Nashville, TN, USA.

SUN-573

Background:

Dyslipidemia is common in patients after transplant. While statins are the mainstay of therapy, interactions with immunosuppressants such as calcineurin inhibitors (CNIs) can limit dose titration or lead to intolerance of this important drug class. Withdrawal of statin therapy can precipitate hyperlipidemia and potentially accelerate cardiovascular disease in transplant recipients, including coronary allograft vasculopathy (CAV) in heart transplant (HT) patients. Proprotein convertase subtilisin-kexin type 9 inhibitors (PCSK9i) may provide a safe, effective option for such patients. PCSK9i profoundly reduce low-density lipoprotein (LDL) and subsequently the risk of cardiovascular events in nontransplant patients. Further, these novel agents have no known interactions with CNIs. There is a paucity of data describing PSCK9i use post-transplant, with only a few small case series reported in HT recipients. Here, we summarize our experience along with available literature on this topic.

Methods:

In this retrospective case series we investigated adult recipients of heart transplant who were treated with PCSK9 inhibitors from July 2015 to 2019 because of statin intolerance or refractory hyperlipidemia. We compared the data of patients at baseline and after various durations of therapy with the PSCK9i evolocumab and alirocumab using the median and interquartile range (IQR). Specifically, we evaluated PCSK9i efficacy, effect on immunosuppressant levels, cardiac function and adverse events.

Results:

Five patients (4 men; median age 54, IQR 52-60) underwent heart transplant an average of 7.4 years ago. Median treatment duration of evolocumab or alirocumab was 12 months (IQR 7-17). This led to a reduction of total cholesterol by 94 mg/dl (p=0.04) (47% decrease) and LDL cholesterol by 83 mg/dl (p=0.04) (69% decrease). No statistically significant difference in HDL cholesterol, triglycerides or liver function tests (LFTs) were observed. There were no episodes of rejection. Immunosuppressant levels remained at goal. One patient noted a few days of fatigue after alirocumab injections but otherwise no side effects were reported.

Conclusion:

The PCSK9 inhibitors evolocumab and alirocumab are promising alternatives to statin therapy in transplant recipients with statin intolerance or refractory hyperlipidemia. Our study showed their potential to significantly reduce LDL cholesterol in heart transplant patients without altering IST levels. No episodes of transplant rejection were noted.

Further long-term studies to establish the safety and efficacy of PSCK9 inhibitors post-transplant are needed.

Bone and Mineral Metabolism

BONE AND MINERAL CASE REPORTS II

Hypercalcemia During Teriparatide Therapy

Jovan Milosavljevic, MD, Asha Mary Thomas, MD, FACP, FACE.
Sinai Hospital of Baltimore, Baltimore, MD, USA.

MON-358

Background: Teriparatide (TPTD) is a recombinant PTH analog used as an anabolic agent in the treatment of osteoporosis that stimulates bone formation and activates bone remodeling. The most common side effects are nausea, vomiting, hypertension and dizziness. Transient hypercalcemia is a known adverse effect which is usually seen a few hours after administration and resolves within 16 hours. However, marked late hypercalcemia is a rare event and may be of concern in clinical practice.

Clinical Cases: **Case 1** is a 54-year-old man with a history of osteoporosis (lumbar spine T-score of -2.8), previously treated with bisphosphonates and who had been on a course of TPTD for about 6 months in but had not been consistent in taking the medication. Prior to subsequently restarting TPTD, his initial labs were notable for a normal Ca 9.3 mg/dl (8.5 - 10.1 mg/dl), vitamin D 25 OH 49 ng/ml (30.0 - 100.0 ng/ml) and PTH 41.3 pg/ml (8.7 - 77.1 pg/ml). Six months into the treatment, he was noted to have asymptomatic hypercalcemia of 11.2 mg/dl approximately 24 hrs after the last TPTD injection. A repeat calcium of 10.7 mg/dl was obtained while still on therapy with TPTD with normal levels of vitamin D 25 OH of 45 ng/ml.

Case 2 is a 75-year-old woman with a history of osteopenia and severe scoliosis, who had been on a course of raloxifene and then preventive doses of alendronate previously. Prior to starting TPTD, her Ca levels were normal at 9.3 mg/dl, PTH was 24 pg/ml and vitamin D 25 OH was 33 ng/ml. However, six months into the treatment she was noted to have elevated Ca of 12.5 mg/dl (24 hrs after the last TPTD dose), with low levels of vitamin D 25 OH of 24.2 ng/ml. Ca levels returned to the baseline of 9.3 mg/dl when TPTD was held.

Conclusion: Teriparatide has a long track record of safety and does have the rare side effect of hypercalcemia. 1-3% of patients may have mild hypercalcemia after administration. Intake of calcium and vitamin D should be monitored at the start of therapy given these concerns. Although almost never a cause of discontinuation of treatment in clinical practice, it is important to be aware of this side effect in patients who may be at risk of complications of hypercalcemia.

Diabetes Mellitus and Glucose Metabolism

CLINICAL STUDIES IN OBESITY, DIABETES RISK, AND CARDIOVASCULAR OUTCOMES

Potential Utility of the Mixed Meal Test for Differential Diagnosis of Partial Lipodystrophy from Common Type 2 Diabetes and Truncal Obesity

Armaan Guraya, MD[1], Maria Cristina Foss de Freitas, MD. PhD.[2], Baris Akinci, M.D.[2], Abdelwahab Jalal Eldin, MS[2], Elif A. Oral, MD[2].
[1]Midwestern University Chicago College of Osteopathic Medicine, Chicago, IL, USA, [2]University of Michigan, Ann Arbor, MI, USA.

SAT-617

Background: Better clinical tools are needed to improve the differential diagnosis of partial lipodystrophy (PL) from type 2 diabetes (DM) with truncal obesity. Here, we investigated differences in metabolic parameters during a mixed meal test in PL and DM patients to determine if this test may have a role in this regard. **Methods:** We retrospectively evaluated data collected from 17 PL patients (4M/13F, ages 12-64) and 20 DM patients (13F/7M, ages 24-72) with truncal obesity, who also had nonalcoholic fatty liver disease. All patients underwent a Mixed Meal Test (MMT) with 474 ml of Optifast (320 kcal, 50% carbs, 15% fat, and 35% protein). Blood was collected before and at 30, 60, 90, 120, and 180 minutes post-meal to measure glucose, insulin, free fatty acids (FFA), triglycerides, inflammatory markers, GIP, GLP-1, PYY, and Ghrelin. All samples of the same cohort were run at the same time in duplicates and results were averaged. Mixed linear models were constructed to compare PL and DM cohorts taking into account within-subject effects. Data were controlled for BMI, sex and age, and glucose when necessary. **Results:** Patients with PL had higher glucose and triglyceride levels throughout the MMT at all-time points ($p < 0.05$). While the glucose levels showed an increase and subsequent decrease, the triglyceride levels remained flat throughout the test in both groups. Free fatty acid levels were suppressed compared to baseline during the test, but PL patients had significantly higher FFA from time 30 to time 180 ($p < 0.05$) and tended to suppress less. While controlling for the differences in glucose levels, GIP levels displayed a large peak at time 30 min in both groups but were significantly higher over the course of the test in the PL group (AUC: 32542, pg/mL x min (20528-57728) vs. 3343 pg/mL x min (1728-4498), $p < 0.05$). In contrast, GLP-1 levels (also peaking at time 30 min in both groups), were significantly lower in PL throughout the test (AUC: 3017 pg/mL x min (2309-6051) vs. 28387 pg/mL x min (20422-36045), $p < 0.05$). Ghrelin and PPY levels did not differ significantly between the two groups. **Interpretation/Conclusion:** PL patients displayed more profound hyperglycemia and impaired suppression of FFAs. Interestingly, PL patients did not show substantial increases in triglyceride levels during MMT. There was a striking difference in the incretin responses between the two populations despite controlling for glucose, suggesting that MMT may have a role in differential diagnosis PL. Also, altered incretin response should be investigated as a contributor to metabolic perturbations and pathophysiology of PL.

Steroid Hormones and Receptors

STEROID AND NUCLEAR RECEPTORS

Regulatory Sharing between Estrogen Receptor Alpha Bound Enhancers

Jay Gertz, PhD, Julia Carleton, PhD, Matthew Ginley-Hidinger, BS.
University of Utah, SALT LAKE CITY, UT, USA.

OR12-04

Mammalian genomes encode an order of magnitude more gene expression enhancers than promoters, suggesting that