underwent a three-hour 75 g oral glucose tolerance test (OGTT) and subsequently a three-hour isoglycaemic intravenous glucose infusion on a separate day. **Analysis:** Baseline hormone concentrations, time to peak and area under the curve (AUC) on the OGTT-day, and the incretin effect in the patient groups and controls were compared using analysis of variance with **post-hoc** analysis.

**Results:** The total group of patients treated with somatostatin analogues (N=15) had numerically impaired glucose, insulin, GLP1 and glucagon responses (AUC, P<0.05 respectively), and an impaired GIP-response (AUC, P=0.007) during OGTT as compared to patients not treated with somatostatin analogues and healthy controls. Similarly, the incretin effect was numerically impaired.

Patients co-treated with pegvisomant (SSA+PEG, N=4) had a numerically increased secretion of insulin and glucagon compared to patients on SSA (N=11) during OGTT (insulin AUC mean (SEM), SSA+PEG 49 nmol/l*min (8.3) vs SSA 25 (3.4), P<0.05 **[healthy controls 62 (13.6)]**; glucagon AUC, SSA+PEG 823 pmol/l*min (194) vs SSA 332 (69), P>0.05 **[healthy controls 946 (233)]**). GIP secretion remained significantly impaired, whereas GLP1 secretion was numerically increased with PEG (SSA+PEG 3088 pmol/l*min (366) vs SSA 2401 (239), P<0.05 **[healthy controls 3972 (451)]** but remained without a glucose-dependant increase as in SSA. The incretin effect numerically increased in SSA+PEG compared to SSA (SSA+PEG 49.9% (13.9) vs SSA 33.6% (47.4), P>0.05 **[healthy controls 55.5% (7.7)]**).

**Conclusion:** Somatostatin analogues impaired the secretion of both insulin, glucagon and incretin hormones secretion. Co-treatment with pegvisomant seemed to counteract the somatostatinergic inhibition of the glucagon secretion and improved the insulin response on OGTT. We speculate that pegvisomant exerts its action via GH-receptors on pancreatic δ-cells.

**Thyroid**

**THYROID DISORDERS CASE REPORTS III**

**A Rare Case of Hypocalcemia-Induced Intractable Vomiting Requiring PEG Tube Placement**

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**MON-464**

**Introduction:** Hypoparathyroidism is characterized by hypocalcemia and hyperphosphatemia secondary to inadequate PTH secretion. Clinical manifestations are carpopedal spasm, perioral paresthesia, and seizures. Herein, we present a case of hypoparathyroid-induced hypocalcemia requiring PEG tube placement.

**Case Presentation:** Patient is a 41-year-old female who presents with intractable nausea, continuous vomiting, abdominal pain, and perioral paresthesia for the past 4 days. Patient has a past medical history significant for hypoparathyroidism, severe hypocalcemia, hypomagnesemia, hyperphosphatemia, and iron deficiency anemia. Patient was diagnosed with hypoparathyroidism at the age of 16 when her son was born with congenital abnormalities due to severe maternal hypocalcemia. She has 4 children, 1 son passed away in infancy from severe hypocalcemia. Out of the remaining 3 children, 2 daughters have hypoparathyroidism. Patient has had multiple recurrent admissions for severe hypocalcemia presenting as angina, syncope, and left-sided weakness. Both cardiology work up and neurology workup have been negative. MRI of the brain shows basal ganglia calcifications. Labs are significant for corrected calcium 6.72 mg/dL (n 8 to 10 mg/dL), magnesium 1.4 mg/dL (n 1.7 to 2.2 mg/dL), phosphorus 7.4 mg/dL (n 2.4 to 4.5 mg/dL), Vitamin D 14.9 ng/mL (n 30 to 100 ng/mL), and PTH level 9.8 pg/mL (n 18.5 to 88 pg/mL). Prior ACTH stimulation test was within normal limits excluding adrenal insufficiency. EGD biopsy on prior admission was positive for H. pylori, however patient left against medical advice and did not receive triple therapy. Patient was admitted for hypocalcemic crisis and placed on a calcium gluconate drip, oral calcium, magnesium, calcitriol, and Vitamin D, in addition to H. pylori triple therapy. During the hospitalization, she was unable to tolerate oral medications for greater than 2 weeks resulting in PEG placement. The patient’s electrolytes were successfully repleted via PEG tube and she was discharged.

**Discussion:** Spontaneous hypoparathyroidism is a rare metabolic disorder characterized by parathyroid glands that do not produce or secrete enough PTH to maintain normal levels of calcium and phosphorous in the blood. Though GI consequences such as steatorrhea may occur, to our knowledge, this is the first reported case of hypocalcemia-induced intractable vomiting requiring PEG tube. Before PEG placement, the patient had 12 admissions in 1 year. After PEG placement, the number dropped significantly to 4 admissions in 1 year. Due to the unique presentation of hypoparathyroid hypocalcemia, we would like to raise awareness regarding such a presentation which can be challenging for clinicians.

**References:** Aboud B, Daher R, Boujaoude J. Digestive manifestations of parathyroid disorders. World J Gastroenterol. 2011;17(36):4063-4066. doi:10.3748/wjg.v17.i36.4063.

**Adrenal**

**PROGRESS IN ADRENAL CORTEX AND MEDULLA RESEARCH**

**New Insights into the Functional Human Adrenal Cortex Zonation**

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**OR03-03**

The zonation of the human adrenal cortex has long been established morphologically and histologically as three distinct layers of cells. The outer zona glomerulosa (ZG) comprises densely packed cells arranged in clusters that produce aldosterone; the zona fasciculata (ZF) is composed of cells with large cytoplasm, containing lipid droplets arranged in radial columns that synthesize cortisol; and the zona reticularis is composed of compact and pigmented cells producing androgens. The main purpose of this...
work was to study the expression of aldosterone synthase (CYP11B2 which catalyzes the last steps of aldosterone synthesis) and 11β-hydroxylase (CYP11B1 which catalyzes the last step of cortisol synthesis) in normal adrenal glands to address issues regarding the zonation and the fate of the cells constitutive of each zone through the expression of Ki-67 and cleaved Caspase-3. Thirty eight normal human adrenals (16 females, 22 males, ranging in age from 22 to 81 years old with a median age of 52 years old) were obtained from brain-dead organ donors (kindly provided by the Organ Transplant Clinics, University Hospital of Rouen). As early as 22 years old, we found that the histological ZG (h-ZG) does not correspond to the functional ZG (f-ZG) expressing CYP11B2. Moreover, the h-ZG CYP11B2-cells were CYP11B1+ showing that these cells ascribed to the h-ZG are in fact cortisol producing cells. The progressive replacement of CYP11B2+ cells by CYP11B1+ cells in the h-ZG might demonstrate the role of the extracellular matrix in the morphological maintenance of the adrenal cortex. Our analysis also showed that steroidogenic cells were either CYP11B1 or CYP11B2 positive. By immunofluorescence, we observed in many cases isolated or clusters of CYP11B2+ cells located deeply in the h-ZF and sometimes in the vicinity of the central vein. We were able to show that those cells were probably issued from CYP11B1+ cell clusters located in h-ZG which migrated centripetally. Ki-67 immunoreactivity was highly variable and observed throughout the entire cortex. We also found a positive correlation between the steroidogenic and endothelial cells proliferation. It is interesting to note that some Ki-67+ cells located in the h-ZG were CYP11B1+. Cortical cells positive for cleaved Caspase-3 were extremely rare but detected in all zones when present. These findings challenge the classic view of lineage conversion of differentiated ZG cells and show a new pathway where the CYP11B2+ cells migrate without changing their phenotype.

**Thyroid**

**BENIGN THYROID DISEASE AND HEALTH DISPARITIES IN THYROID II**

*Fatigue and Quality of Life Among Thyroid Cancer Survivors*

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**SUN-416**

Fatigue and quality of life among thyroid cancer survivors

**BACKGROUND** Fatigue among thyroid cancer survivors is an important issue that needs to be appreciated and managed appropriately. Although several studies have reported potential factors that might be related to postoperative fatigue, the associations have yet to be inconclusive. The purpose of the present study was to estimate the prevalence of clinical fatigue in patients with papillary thyroid carcinoma and to reveal predictive factors, including their quality of life. **METHODS** A cross-sectional survey was conducted on patients with papillary thyroid carcinoma. Patients who underwent non-curative surgery, or those with recurrent or metastatic PTC, or those with other malignancies were excluded. The primary outcome was fatigue measured by the Cancer Fatigue Scale (CFS), and the secondary outcome was quality of life (QoL) quantified using the SF-36 v2. The following explanatory variables were collected; gender, age, employment status, marital status, co-morbidities, time since initial surgery, types of surgery, replacement of thyroid hormone, use of radioactive iodine, and the level of thyrotropin. The prevalence of clinical fatigue was estimated with the cut-off value of 18/19 of the CFS score. Correlations between the CFS score and the explanatory variables were examined using uni-variable analyses as well as multi-variable analysis. **RESULTS** Three hundred twenty-one patients participated in the survey. Of them, 258 respondents (80%) were female. The median age was 58 years, and the median time from initial surgery was 6.4 years. The mean and the standard deviation of the CFS score were 17.9 and 9.3, respectively (range: 0-48). The prevalence of clinical fatigue was 42% [95%CI: 36-47%]. Among the variables explored, having a job and scores of the mental component summary, the physical component summary, and the role/social component summary of the SF-36 were inversely associated with the CFS score in both uni- and multivariable analyses. **CONCLUSION** Postoperative fatigue was common in thyroid cancer survivors. Patients with a job and better QoL, in particular, those with good mental health, maybe at low-risk of developing the burden.

**Tumor Biology**

**TUMOR BIOLOGY: GENERAL, TUMORIGENESIS, PROGRESSION, AND METASTASIS**

**Breast Adipose Tissue Extracellular Vesicles from Obese Women Increase Breast Cancer Aggressiveness - a Novel Mechanism for the Obesity-Breast Cancer Link.**

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**SAT-126**

**Background and Objectives:** Breast cancer is among the most common cancer in women with 2.1 million new cases detected each year. Numerous studies have demonstrated a connection between body mass index (BMI) and cancer incidence, with obesity (BMI ≥ 30) being responsible for the development of at least 13 types of cancer, and 15% to 20% of total cancer-related mortality. The effects of extracellular vesicles (EVs) derived from the obese adipose tissue micro-environment on breast cancer have not yet been clearly elucidated.

**Methods:** EVs were obtained from media conditioned with human breast adipose tissue from reduction mammoplasty (n=31). Women were healthy at the time of surgery and had no history of breast cancer. Patient samples were stratified based on their body mass index (BMI), with a BMI < 25 considered healthy and a BMI ≥ 25 considered overweight/obese. Breast adipose tissue-derived EVs (AT-EVs) were characterized (Quantitative Mass Spectrometry) and used to treat human breast cancer cell lines, including the ER+ MCF7 and triple...