Dunnett's post-hoc test: M vs FPREOC: P < 0.0001, FPRE vs FPREOC: P = 0.0007, FPOST vs FPREOC: P < 0.0001). IGFBP 3 was not different in females with and without oral E2 (median IGFBP 3 xULN (IQR) FPREOC vs FPRE: 0.62 (0.54 - 0.67) vs 0.60 (0.49 – 0.76), Kruskal-Wallis P = 0.295, Dunn's post-hoc test: P > 0.9999). This was also true between all other groups (Dunn's post-hoc test: P ≥ 0.4). In our adult cohort, ALS exhibited negative correlation with age (Pearson r = -0.282, P = 0.0003), similar to IGF-I and IGFBP 3. While IGF-I exhibited a moderate negative correlation to BMI (Pearson r = -0.25, P = 0.0013), IGFBP 3 and ALS were not significantly related to BMI.**Conclusion:** While IGF-I, IGFBP 3 and ALS all are known to be secreted in response to GH, and IGF-I and ALS are assumed to be produced by the same cells in the liver (hepatocytes), the three GH dependent biomarkers appear to be differently regulated by metabolic factors and oral E2. Only IGF-I has some modest association with BMI. Oral E2 is associated with reduced IGF-I, unchanged IGFBP 3 but increased ALS. While the mechanism behind the differential regulation remains to be uncovered, E2 therapy must be taken into account when interpreting IGF-I and ALS concentrations.

Bone and Mineral Metabolism

OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

Radiofrequency Echographic Multi-Spectrometry (REMS) for the Assessment of Bone Strength and Fracture Risk Prediction

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SUN-LB74

Introduction Fragility bone fractures impact patient's quality of life and worldwide healthcare systems: accurate technologies and device are required in order to early diagnose and monitor the effect of osteoporosis on a mass-population basis. Several studied have analysed the pros and cons of the numerous technologies available nowadays for the diagnosis and monitoring of bone health, highlighting the need of further tools able to better define and estimate bone strength and to predict the risk of fracture [1].

Objectives The aim is to assess the state of the art about Radiofrequency Echographic Multi-Spectrometry (REMS).

Methods A review of the available literature was performed, considering full papers, reviews and abstracts on REMS published before January 31th 2020.

Results REMS has been recently presented by an ESCEO consensus paper as a valuable technology for osteoporosis diagnosis and fracture risk estimation [1]. It is based on the automatic processing of the raw unfiltered signals obtained with an ultrasound scan, thus overcoming the main drawback of dual-energy X-ray absorptiometry (DXA) and computed tomography (CT)-based technologies [2]. Moreover, REMS scans are performed at axial skeleton reference sites, i.e. lumbar spine [3] and femoral neck [4], differently from quantitative ultrasound (QUS) technology, which is usually applied to peripheral sites [3]. Clinical performance has been confirmed by a multicentre clinical trial enrolling over 1900 Caucasian women, demonstrating a high correlation between bone mineral density (BMD) estimated by REMS and DXA. In addition, high performance in terms of precision and intra- and inter-operator repeatability of REMS have been assessed [6]. Prospective studies have demonstrated the predictive ability of incident fragility fractures [7] and the high concordance with DXA in terms of measured BMD in patients with rheumatoid arthritis and pre/post-menopause [8, 9].

Conclusions REMS is an innovative approach for the early diagnosis, short-term monitoring of osteoporosis and risk fracture prediction. The available data envisaged for further applications in paediatric patients, pregnant women and patients at risk of secondary osteoporosis (e.g., diabetic, nephropathic, oncological patients). The EchoS system, a device implementing the REMS technology, has recently received the approval from the U.S. Food and Drug Administration (FDA).

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Reproductive Endocrinology

REPRODUCTIVE ENDOCRINOLOGY: REPRODUCTIVE FUNCTION AND DYSFUNCTION ON DEVELOPMENT

Association Between Sex Steroid and Metabolic Parameters in Cord Blood With Placental Fatty Acid Transporter in Obese Pregnant Women.

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MON-LB6

Obesity reduces maternal insulin sensitivity and alters sex steroid serum concentrations. However, it is not clear if these changes are reflected in the fetal circulation. On the other hand, similar to other metabolic tissues, modifications in sex steroid concentrations and metabolic parameters could modify the transport and metabolism of fatty acids (FA) in the placenta increasing their availability for the fetus. Therefore, we aimed to study, in pregnant women with normal-weight and obesity, sex steroid serum concentrations in cord blood and their relationship with the gene expression of FA transporters and of molecules related with FA metabolism in the placenta. We included 26 pregnant women with normal-weight and 26 pregnant women with obesity without pregnancy complications. At term of pregnancy, mixed cord blood and placenta samples were collected and stored at -80°C. Serum concentrations of dehydroepiandrosterone (DHEA), DHEA sulfate

(DHEAS), androstenedione, testosterone, estrone, estradiol, estriol, insulin and TNF-α were measured by RIA or ELISA. Glycemia and lipid profile were also analyzed. In placental samples, the gene expression of *MFSD2A*, *CD36*, *FABP4*, *SLC27A4*, *PPARG*, *LPL* and *DGAT* were determined by quantitative PCR. No differences were observed in sex steroid concentrations and metabolic parameters between groups. On the other hand, the gene expression of *MFSD2A*, *CD36* and *FABP4* were higher in placentas from women with obesity compared to women with normal-weight (P = 0.050, P = 0.037 and P = 0.038, respectively). When distributed according to fetal sex, cholesterol levels were higher in cord blood of women with obesity and female fetuses (P = 0.005), whereas glycemia was lower in women with obesity and male fetuses (P = 0.045). In turn, the gene expression of *CD36* and *FABP4* were higher (P = 0.024 and P = 0.034, respectively), whereas *MFSD2A* tended to be higher (P = 0.092) only in placentas from women with obesity and male fetuses. Moreover, in women with obesity and male fetuses, glycemia was positively correlated with *MFSD2A* (r = 0.650; P = 0.022), and in women with obesity and female fetuses *FABP4* was inversely correlated with triglyceride levels (r = -0.580; P = 0.048). In conclusion, these data suggest that modifications in placental steroidogenesis do not affect sex steroid serum concentrations in the fetal circulation. On the other hand, metabolic parameters in cord blood of pregnant women with obesity are associated with an abnormal expression of FA transporters in placental tissue.

Tumor Biology

ENDOCRINE NEOPLASIA CASE REPORTS III

Primary Hyperparathyroidism and Meningioma as a Part of Multiple Endocrine Neoplasm Type 1 (MEN Type 1)

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SAT-LB308

Background: Meningioma is a rare association of Multiple endocrine neoplasia type 1 (MEN 1) and very few cases has been reported in literature. **Clinical Case:** a 75-year-old woman showed severe headache, disturbed consciousness and convulsions. A diagnosis of cerebral meningioma was made and surgical excision was done, histopathological examination confirmed meningioma; patient was transferred to the ICU postoperatively for monitoring. Patient's consciousness was not regained in full and remained in delirium, follow up investigations revealed: serum calcium of 13.2 mg/dl (8.5 to 10.5 mg/dl), serum sodium 141 mmol/L (135-145 mmol/L) and potassium 4.9 mmol/L (3.5-5 mmol/L), serum parathormone of 850 pg/mL (10-65 pg/mL), primary hyperparathyroidism was suspected; further investigations revealed inferior parathyroid adenoma on ultrasound which elicited focal tracer uptake on sesta-mibi parathyroid scintigraphy. Patient did excision of the lesion and was confirmed by histopathological examination to be parathyroid adenoma. Patient recovered well postoperatively, consciousness was regained and no neurological defects ware present. Genetic studies where performed and was found positive for MEN type 1 gene. Whole body Ga-DOTATATE PET/CT was then done to exclude any associated tumors and no tracer uptake was found. Patient was discharged, family members were offered genetic analysis and were counselled on the importance of screening. **Conclusion**: MEN type 1 can rarely present with meningiomas with symptoms very similar and easily confused with hypercalcemia and the diagnosis can be missed.

Thyroid

THYROID CANCER CASE REPORTS I

Coexistence of Medullary Thyroid Cancer With Graves Disease: A Case Report

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SUN-LB82

Coexistence of Medullary Thyroid Cancer with Graves Disease: A Case Report

A 59 year old woman presented with enlarged thyroid, weight loss, and hot flushes. She had previously been treated for a thyroid problem in 2013 but was lost to follow up.

On exam, she had a diffusely enlarged thyroid gland, without distinct nodule. She had brisk DTR's and mild tremor. Lab results confirmed hyperthyroidism:TSH <0.01 mIU/L (0.27 to 4.2) FT4 2.4 ng/dL (0.9 to 1.8) FT3 7.95 pg/mL (1.8 to 4.6). TSI was 307 % (<140%).

Thyroid ultrasound showed a few sub-centimeter nodules, and 2 clinically significant nodules on the right--1.5 x 1.2 x 1.4 cm, cystic with calcifications; and 1.3 x 0.7 x 1.2 cm hypoechoic. **I-123** thyroid uptake/scan showed 61% uptake and 2 right sided cold nodules. FNA biopsy showed medullary thyroid carcinoma (MTC) with staining positive for calcitonin and negative for thyroglobulin. CT thyroid showed no adenopathy. Serum calcitonin was 71 pg/mL (<5), and CEA was elevated 5.4 ng/mL (<2.5). Work up was negative for pheochromocytoma and hyperparathyroidism. After pretreatment with methimazole, she underwent total thyroidectomy with bilateral TE groove dissection. Surgical pathology confirmed MTC pT1b pN1a. She was started on levothyroxine therapy post operatively.

Discussion There are multiple reports of thyroid carcinoma (papillary and follicular) in Graves disease, but rarely MTC.[1] A recent systematic review reports only 21 total cases of MTC in patients with hyperthyroidism, of whom 15 had Graves disease.[2] MTC is derived from C-cells from the thyroid gland rather than from follicular cells. TSI, therefore, should not influence development or growth of MTC. Coexistence of the two conditions is likely coincidental rather than causative.

ConclusionThyroid nodules in patients with Graves should be worked up as there is a possibility of co-existing thyroid carcinoma. This patient had hyperthyroidism with cold nodules on nuclear scan corresponding to sonographic nodules. Based on these results, she had biopsy leading to diagnosis of MTC. Follow up surgery lead to diagnosis of MTC at earlier stage and provided treatment for both conditions.