children. Her mother carried a diagnosis of rheumatoid arthritis and osteoporosis. The only pertinent physical exam finding was short stature (Height -4'6"). A DEXA scan was performed using a Hologic unit and revealed a T Score of -1.0 at the L-spine and -1.9 at the femoral neck. A FRAX score predicted a 14% risk of major osteoporotic fracture and 4% risk of hip fracture.

Laboratory data revealed: Serum Calcium 9.3 (8.5-10.5 mg/dL), Albumin 4.3 (3.5-5.0 g/dL), ALP 21 (<130 U/L), Vitamin D 25OH 46.2 (>30 ng/ml), Intact PTH 28.3 (15.0-65.0 pg/ml), Vitamin B6 87.7 (2-21 ng/ml).

On review of her medical record, low ALP levels ranging between 20-30 U/L were noted to be present for the last twenty years. Given her history of musculoskeletal complaints, short stature, elevated Vitamin B6 and low ALP, genetic testing for hypophosphatasia was performed. Her results confirmed a known pathogenic mutation in the ALPL gene.

Conclusion: This case highlights the importance of reviewing ALP levels and relevant patient history to rule out hypophosphatasia prior to initiating therapy for osteoporosis. This condition is often unrecognized. Bisphosphonates, which are often the first line of treatment in osteoporosis, are contraindicated in hypophosphatasia as they can increase the risk of atypical fractures.[1] Teriparatide may improve bone density depending on the extent of ALP deficiency. Asfotase alfa is a new agent that is currently available for the management of certain cases of hypophosphatasia.

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Neuroendocrinology and Pituitary
ADVANCES IN NEUROENDOCRINOLOGY

Deletion of KNDy Neuron-Specific KISS1 Disrupts Estrous Cyclicity and LH Pulsatility in Female Mice

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SUN-243

Kisspeptin (encoded by *Kiss1*), a neuropeptide critically involved in neuroendocrine regulation of reproduction, is primarily synthesized in two discrete hypothalamic nuclei: the anteroventral periventricular area (AVPV) and arcuate nucleus (ARC). AVPV *Kiss1* is important for the pre-ovulatory luteinizing hormone (LH) surge unique to females as well as estrogen-induced positive feedback control of GnRH and LH. In contrast, ARC *Kiss1* neurons, which largely co-express the neuropeptides NKB and dynorphin (collectively known as KNDy neurons), are major regulators of pulsatile release of GnRH and LH, and mediate estrogen-induced negative feedback control of both GnRH and LH. Previous studies have not fully separated the specific roles for *Kiss1* in the AVPV versus KNDy-ARC neurons in the downstream control of GnRH and LH release. Therefore, we generated a Pdyn-Cre/Kiss1^fl/fl^ (KO) mouse model to

target *Kiss1* in the KNDy neurons to differentiate KNDy neuron-specific function from AVPV *Kiss1* function in the maturation and maintenance of the reproductive axis. qRT-PCR data documented a significant reduction of *Kiss1* expression in the mediobasal hypothalamus (containing ARC) compared to controls, whereas *Kiss1* in the preoptic area (containing AVPV) was similar in both KO and controls. Immunofluorescent IHC confirmed a loss of kisspeptin immunoreactivity in the ARC of KO animals while expression in the AVPV remained intact. Markers of pubertal onset (day of vaginal opening and first estrus in females; day of preputial separation in males) were normal in KO mice, suggesting that AVPV *Kiss1* and/or other neural signals may be sufficient for pubertal onset. In addition, body weight throughout pubertal growth was comparable between KO and control animals of both sexes. Interestingly, KO female mice had disrupted estrous cycles presenting with persistent diestrus and a small vaginal opening. In order to test our hypothesis that conditional deletion of *Kiss1* in KNDy neurons disrupts or ablates episodic GnRH/LH pulsatile release, we collected serial tail blood samples from mice at diestrus and measured LH. KO female mice exhibited significantly fewer LH pulses in a 3-hour timespan compared to controls, suggesting that KNDy neurons were functionally compromised. These observations indicate the central role of KNDy neurons in the regulation of GnRH/LH pulsatility and estrous cyclicity. The functional effects of disrupted estrous cyclicity and slower LH pulses observed in KO females are currently under study to assess potential abnormalities in ovarian folliculogenesis and fertility. Future experiments will determine whether ARC *Kiss1* deletion disrupts the KNDy-driven negative feedback response of LH to gonadectomy, as well as address potential sex differences in ARC *Kiss1*-mediated negative feedback control of LH release.

Thyroid
THYROID NEOPLASIA AND CANCER

Technologies of Diffuse Optics in the Diagnosis of Thyroid Cancer

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MON-488

Technologies of diffuse optics in the diagnosis of thyroid cancer
BACKGROUND:
The most common tool to test malignancy in the study of thyroid nodules (NT) is ultrasound and fine needle aspiration biopsy (FNAB). However, the sensitivity and specificity of the method and the effectiveness in thyroid cancer are limited; therefore new methods to study thyroid nodules are required. In this way our goal is to introduce hybrid diffuse optical instruments that are capable to measure

and discriminate altered microvascular blood flow, blood volume and tissue scattering coefficients of TN. Near-infrared diffuse optical technologies aim to overcome the shortcomings of present techniques while screening for malignant thyroid nodules for early and fast diagnosis of cancer. This idea was based on the previous experience in breast cancers with diffuse optical techniques.

METHODS:

We have developed a device based on near-infrared diffuse correlation spectroscopy (DCS), which is a technology aimed at retrieving the microvascular flow of a certain region of tissue by mean of low power near-infrared laser light, and used in combination with a commercial ultrasound system (US). In order to combine these devices, we have developed a probe enabling multimodal data acquisition and subsequently we have analyzed the optical properties and the blood flow index in the thyroid lobes of eleven subjects who presented a thyroid nodule.

RESULTS:

Four subjects have required FNAB: P4 and P7 were reported as being malignant (Bethesda VI and IV respectively) while P6 and P8 were evaluated as being benign (Bethesda II). Surgical removal confirmed papillary thyroid carcinoma in P4, while denied the result of FNAB for P7 (Multinodular thyroid hyperplasia). We have considered the contralateral lobe as intra-subject reference to validate the feasibility of the DCS system in a very absorbing tissue as thyroid is. The difference between the blood flow index of the nodule and the contralateral lobe is maximum for subject P4, while the difference in benign subjects is lower. T-test showed no significant difference between benign nodules and contra-lateral lobes. Subject P7 showed a small difference as for other benign subjects despite the FNAB results indicating presence of malignancy.

CONCLUSION:

Apparently diffuse optics technologies would be able to differentiate malignant thyroid nodules from benign thyroid nodules, but more measurements require confirming our preliminary results as that diffuse optical technology can complement the current techniques such as US and FNAB. A new measurement campaign is being scheduled with a completed, fully integrated device that was developed within the LUCA project (http://www.luca-project.eu).

Bone and Mineral Metabolism
CLINICAL ASPECTS OF OSTEOPOROSIS AND VITAMIN D ACTION

Insulin Resistance and Osteoporosis in People Living with HIV

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MON-385

The life expectancy of people living with HIV (PLHIV) increased considerably after the advent of antiretroviral therapy (ARV). Nowadays, it is almost the same as the general population. However, this increase in survival exposes PLVH to age-related morbidities, including chronic metabolic and bone diseases. PLHIV has a low bone mineral density (BMD) and a high prevalence of osteoporosis. Moreover, the frequency of diabetes mellitus (DM) seems to be twice the frequency of the general population. Insulin resistance and DM might be associated with bone diseases in PLHIV. Our study aim was to evaluate the association between insulin resistance and osteoporosis in PLHIV. We carried out a cross-sectional study at the municipality of Santa Maria, South Brazil. PLHIV age 50 yrs or over on treatment with ARV were included. All subjects registered to receive ARV in the university hospital during the period 2016 to 2018 were invited to participate. Those who accepted responded to a standardized questionnaire, performed a bone density scan and a lateral spinal X-ray, underwent peripheral blood collection, and had their weight and height measured. Insulin resistance was considered present when HOMA-IR> 2.7 (Gelonese, 2009). The TyG index was also calculated (VASQUES, 2011). Of the 101 PLHIV who agreed to participate, 84 underwent both insulin and BMD measurements. The prevalence of osteoporosis was 19%. Vertebral fractures were twice as frequent in individuals with osteoporosis (73.3% vs. 36.5%, p = 0.018). Participants with osteoporosis had lower BMI and triglyceride values than those without it. The frequency of insulin resistance calculated by HOMA-IR was 68.2%, and it was associated with glucocorticoid use, smoking, and BMI. HOMA-IR [4.8(6.6) vs. 8.68(9.6), p =0.013], and TyG [5.0(0.3) vs. 5.2 (0.4), p=0.029] mean values were lower in the group with osteoporosis; however, this association disappeared after correction for BMI in the logistic regression model. In conclusion, in our study, PLHIV with osteoporosis have lower insulin resistance than PLHIV without it. Nevertheless, this finding appears to be relating to a lower BMI. Further studies are needed to assess the effect of insulin resistance on fracture risk in PLVH.

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Bone and Mineral Metabolism
OSTEOPOROSIS: DIAGNOSIS AND CLINICAL ASPECTS

Bone Mineral Density and Body Mass Index in Men with Cystic Fibrosis

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SUN-392

Osteoporosis is an important endocrine complication of cystic fibrosis (CF). Low bone mass in CF patients has multiple contributing causes including vitamin D deficiency,