control females (1st day, 0.728±0.007, 2nd day, 0.728±0.060) suggesting constrained switching between lipids and other carbon sources for energy metabolism during fasting in ErKD females. We found no significant differences in 24 hr, 12 hr light or 12 hr dark EE and RER. Overall, these findings highlight MBH ESR1 roles in regulating body weight, energy expenditure and carbon sources utilized in daily energy metabolism, and suggest a discrete MBH location for development of therapeutic targeting to combat female obesity.

**Diabetes Mellitus and Glucose Metabolism**

**DIABETES TECHNOLOGY**

**Is the FreeStyle Libre Flash Glucose Monitor Accurate in the Critically Ill?**

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**SAT-639**

The FreeStyle Libre flash glucose monitor (FGM) has made the use of continuous glucose monitors more accessible to the typical diabetes patient in an outpatient setting given the significantly lower cost and ease of use of FGM as compared to other systems. However, FGM is not labeled for use in a critically ill population. The critical care department at our institution queried the endocrine department about studying the use of FGM in critically ill patients. The interest of the critical care department was due to the potential of decrease in patient discomfort and decrease in time and effort of nursing and support staff related to the performance of fingerstick capillary gluoses if FGM was an adequate replacement measure.

As of yet, there has been only minimal study of flash glucose monitoring in critically ill patients. One Australian study evaluated 8 patients in an ICU setting and determined that as compared with arterial blood glucose monitoring, flash glucose monitoring provided acceptable numerical and clinical accuracy.1 A Swedish study evaluated a total of 26 patients undergoing cardiac surgery and compared the use of FGM to use of a microdialysis intravascular system and concluded that the microdialysis system was more accurate, though in this study, only 25% of patients had diabetes. 2

To further investigate use of FGM in a critically ill population, we plan to undertake a single center, prospective, single arm study enrolling at least 20 and up to 40 patients. Inclusion criteria include a known diagnosis of type 1 or type 2 diabetes, age of 18 or older, and admission to the medical intensive care unit (MICU) with expected MICU stay of at least 48 hours.

Participating subjects will have a sensor applied by a study investigator. After confirmation that the sensor is operational, the investigator will place opaque tape over the sensor at time of fingerstick glucose data collection. The primary objectives are to determine numerical accuracy in a critical care setting using the mean absolute relative difference and to determine clinical accuracy in a critical care setting using the surveillance error grid and the clark error grid analyses. Preliminary data should be available by March, 2020.

1. Ancona P, Eastwood GM, Luchetta L, Ekinci EI, Bellomo R, Martensson J. The performance of flash glucose monitoring in critically ill patients with diabetes. *Crit Care Resusc* 2017; 19: 167-174, June 2017.
2. Schierenbeck F, Franco-Cereceda A, Liska J. Accuracy of 2 Different Continuous Glucose Monitoring Systems in Patients Undergoing Cardiac Surgery: Intravascular Microdialysis Versus Subcutaneous Tissue Monitoring. *Journal of Diabetes Science and Technology* 2017, Vol. 11(1) 108–116

**Neuroendocrinology and Pituitary**

**NEUROENDOCRINOLOGY AND PITUITARY**

**Retrospective Analysis of Gonadotropin-Mediated Pubertal Induction in Male Patients with Congenital Hypogonadotropic Hypogonadism (CHH)**

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**MON-273**

CHH is a rare disease characterized by a failure to enter (complete forms) or to complete (partial forms) pubertal development. It has a strong genetic background and it needs a treatment to allow the puberty to complete. In male this goal could be achieved either by the classic testosterone replacement therapy or by the exogenous gonadotropins (Gn) administration which allows both the endogenous testosterone production and the testicular development. So far, only few studies have explored this latter therapeutic approach in inducing the CHH pubertal development and no internationally recognized protocols are available. Aim of this retrospective analysis is to (i) investigate clinical and biochemical predictors of testicular response to Gn-induced puberty in CHH; (ii) study the non-reproductive outcomes of this treatment (height, body proportions) and their determinants. A total of 19 CHH male patients, undergoing two years of Gn-mediated (FSH and hCG) puberty induction started between the ages of 14 and 23 years, were retrospectively evaluated. For each patient clinical history, physical examination, hormonal evaluation, and genetic analysis using Targeted Next Generation Sequencing for CHH genes was performed; 8 patients accepted to perform a semen analysis (SA) at the end of their treatment. Mann Whitney test and multiple regression analysis showed testicular volume after 24 months of Gn-mediated pubertal induction, to be significantly associated with: (i) the presence...
of cryptorchidism; (ii) the presence of a completely definable genetic cause for the disease; (iii) the presence of a complete CHH form. No significant association was found with the cumulative dose of hCG administered in 24 months. The statistical analyses regarding SA could not find the same associations. Multiple regression analyses investigating the eunuchoid habitus and a measure of the difference of subject’s final height from his target (deltaSDSth), showed a significant association with: (i) age at the beginning of the induction; (ii) the duration of growth during induction; (iii) and (for deltaSDSth) bone age before the induction. Duration of growth during induction resulted to be associated with previous testosterone priming and with partial CHH. In summary, our study confirms cryptorchidism and complete genetic forms of CHH as negative predictors of testicular response probably because they usually affect early phases of life with a complete GnRH deficiency. We also found that the eunuchoid habitus and deltaSDSth are associated not only with delayed treatment, but also with the duration of stature growth during the induction, apparently related to earlier androgenization.

**Neuroendocrinology and Pituitary**

**ADVANCES IN NEUROENDOCRINOLOGY**

**PROKR2 Neurons of the Amygdalohippocampal Area in Reproductive Function**

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**SUN-253**

Kallmann Syndrome (KS) is characterized by infertility and anosmia due to deficiency in gonadotropin releasing hormone (GnRH) neuronal migration and olfactory bulb dysgenesis. Genetic studies have revealed that KS is caused by loss-of-function mutations in several genes including the prokineticin receptor 2 (PROKR2) gene (Abreu et al., 2008, Hardelin & Dode 2008). Mice with global deletion of Prokr2 replicate the phenotype of KS patients (Ng et al., 2005, Matsumoto et al., 2006). Whereas the role of PROKR2 during development is defined, little is known about PROKR2 neurons in adult reproduction. PROKR2 mRNA are highly expressed in reproductive control sites of the adult mouse brain (Cheng et al., 2006). Previous studies in our lab found PROKR2 mRNA and Prokr2-Cre GFP+ cells highly expressed in the amygdalohippocampal area (AHi, also called posterior nucleus of the amygdala) in a sexually-dimorphic pattern. Male mice have higher PROKR2 expression in the AHi compared to female mice (Mohsen et al., 2017). The amygdala is an important site of socio-sexual inputs and reproductive neuroendocrine responses in rodents and primates, including humans. We hypothesize Prokr2-Cre neurons in the AHi have a role in both male and female reproductive function. Using genetic tracing techniques, we mapped AHi Prokr2-Cre neuronal projections in both male and female mice and found dense innervation to reproductive control sites such as the medial preoptic area and the ventral premammillary nucleus in a sexually dimorphic pattern. A soiled bedding exposure test in sexually experienced male mice showed that an estimated 45% of cFos + cells in the AHi express Prokr2-Cre GFP. Dense sex steroid receptors expression was observed in AHi Prokr2-Cre GFP neurons of both male and female mice. Our preliminary data suggests AHi Prokr2-Cre neurons have a reproductive function in male and potentially also in female mice. Future studies will focus on selective activation and inhibition of these neurons using chemogenetic technology to determine putative inputs to brain sites that control the hypothalamo-pituitary-gonadal axis. We expect our studies will contribute to the understanding of the role of PROKR2 neurons in adult reproduction and reproductive deficits associated with PROKR2 mutations.

**Neuroendocrinology and Pituitary**

**CASE REPORTS IN UNUSUAL PATHOLOGIES IN THE PITUITARY II**

**PLEOTROPIC CLINICAL PRESENTATION IN TWO BRAZILIANS PATIENTS WITH CONFIRMED IG4-RELATED HYPOPHYYSIS IUF de Oliveira, MD, Pedro Gomes de Vasconcelos Silva, MD, Daniel Bortolin Muller, MD, Sheila Aparecida Coelho Siqueira, MD, PhD, Rosely Antunes Patzina, PhD, MD, Rosa Maria Rodrigues Pereira, MD, PhD, Maria Adelaide Albergaria Pereira, MD, PhD, Marcello Delano Bronstein, MD, PhD, Andrea Glezer, MD, PhD.**

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**MON-264**

**Background:** Hypophysitis is a rare condition characterized by inflammation of the pituitary gland, usually resulting in hypopituitarism and pituitary enlargement with mass effect symptoms. IgG4-related hypophysitis can occur alone or as part of a multiorgan disease. Treatment with glucocorticoids is effective in 97% of the cases in reducing pituitary mass.

**Clinical cases:** Case #1. A 56-yrs man with previous diagnosis of Mikulicz syndrome was referred to our service with fatigue and erectile dysfunction. Laboratory evaluation revealed hypogonadotropic hypogonadism, hyperprolactinemia (PRL=108 ng/mL) and central hypothyroidism. Sellar MRI depicted a pituitary mass with pituitary stalk thickening and a homogeneous uptake of gadolinium. During clinical follow-up, he also presented retroperitoneal fibrosis and IgG4-related disease was confirmed by serum IgG4 elevation and a pathological review of the previous salivary gland biopsy. Prednisone 80 mg/d treatment was initiated, with recovery of the thyrotrophic axis, reduction of PRL levels and significant reduction of the pituitary lesion. Due to maintenance of inflammatory activity and worsening of renal function, azathioprine therapy was associated, with subsequent inclusion of rituximab. Case #2. A 16-yrs boy was referred to our service presenting severe headache, bilateral visual deficit, right eyelid ptosis, hyposmia, polyuria and polydipsia. Cranial MRI depicted an extensive skull base mass involving pituitary gland, optic nerves, cavernous sinuses, olfactory bulb and clivus. Hormonal evaluation confirmed normoprolactinemia, hypogonadotropic hypogonadism and diabetes insipidus. Biopsy of the lesion revealed meningeval inflammation with immunohistochemistry suggesting IgG4-related sclerosing disease. No other organs were affected. An important lesion reduction and gonadotropic axis recovery occurred after