revealed signs of left ventricular failure, with a normal blood pressure and heart rate. A transthoracic echocardiogram (TTE) revealed dilated left ventricle with severe global hypokinesis and a left ventricular ejection fraction (LVEF) of 15%. A CTPA performed to exclude pulmonary embolism revealed an incidental right sided adrenal lesion measuring 3.9 X 3.4 X 3.7 cm. Subsequently a dedicated abdominal CT confirmed the adrenal lesion. Biochemistry revealed elevated 24 hour urine catecholamines and metanephrines and an elevated plasma metanephrines. Subsequently he proceeded to have adrenalectomy. Preoperatively the patient was managed with alpha and beta blocking agents for 3 weeks prior to surgery. Postoperative course was uneventful and histopathology confirmed right sided phaeochromocytoma. TTE performed 12 months post-operatively showed a significant improvement in his LVEF to 40 % with subsequent TTE showing maintenance of LVEF. This case demonstrates highlights the unusual presentations of phaeochromocytomas and that early recognition and early intervention with surgery is the key to recovery to avoid catastrophic cardiac events.1. Chiang YL, Chen PC, Lee CC, et al. Adrenal pheochromocytoma presenting with Takotsubo-pattern cardiomyopathy and acute heart failure: A case report and literature review. *Medicine (Baltimore)*2016;95(36):e4846. doi: 10.1097/MD.0000000000004846 [published Online First: 2016/09/08]

Adipose Tissue, Appetite, and Obesity

ADIPOSE TISSUE BIOLOGY AND OBESITY

Obesity Is Associated With Reduced Expression of the Anorexigenic Neuropeptide Nucleobindin-2/Nesfatin-1 in the Human Nucleus of the Solitary Tract.

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SAT-LB102

Introduction: Feeding is a complex behavior coordinated by interrelated forebrain, hypothalamic, and brainstem neuronal networks. Brainstem neurons constitute an important input for the neural circuitry integrating nutrient signals to control ingestive behavior. Orexigenic and anorexigenic neuropeptides act in concert to regulate energy balance. Data from animal models suggest that altered neuropeptidergic expression contributes to obesity. Nucleobindin-2/nesfatin-1, an appetite-suppressing neuropeptide and negative regulator of body weight, is reduced in the hypothalamus of mouse obesity models. In obese and overweight humans, we have recently reported decreased nucleobindin-2/nesfatin-1 immunoexpression in the lateral hypothalamic area, which is critically involved in appetite and metabolic regulation and has extensive connections with brainstem feeding circuits. **Objective**: The present study explored nucleobindin-2/nesfatin-1 localization pattern as well as the association between nucleobindin-2/nesfatin-1 protein expression and body weight in human brainstem nuclei. **Methods**: Sections of 20 human brainstems (13 males, 7 females; 8 normal weight, 6 overweight, 6 obese) were examined by means of immunohistochemistry and double immunofluorescence labeling. **Results**: Nucleobindin-2/nesfatin-1 widespread distribution was observed in various brainstem areas, including nuclei with well-defined roles in energy homeostasis and in autonomic and behavioral processes, such as the nucleus of the solitary tract, dorsal motor nucleus of vagus, area postrema, inferior olive, raphe nuclei, reticular formation, locus coeruleus, parabrachial nuclei, and pontine nuclei, and in Purkinje cells of the cerebellum. Interestingly, nucleobindin-2/nesfatin-1 immunofluorescence signal extensively localized in neuronal subpopulations expressing neuropeptide Y and cocaine- and amphetamine-regulated transcript (peptides known to exert potent actions on food intake and energy balance) in nucleus of the solitary tract, inferior olive, locus coeruleus, and dorsal raphe nucleus. Of note, nucleobindin-2/nesfatin-1 immunoexpression was significantly lower in obese than normal weight subjects in the nucleus of the solitary tract ($p<0.05$). **Conclusions**: These data provide for the first time neuroanatomical support for the potential role of nucleobindin-2/nesfatin-1 in human brainstem circuits controlling energy homeostasis. In nucleus of the solitary tract, a key integrator of nutrient state signals and a neural substrate of food reward-related processes, altered neurochemistry such as nucleobindin-2/nesfatin-1 deficiency may contribute to dysregulation of homeostatic and/or hedonic feeding behavior and ultimately to obesity.

Pediatric Endocrinology

PEDIATRIC OBESITY, THYROID, AND CANCER

The Effectiveness of Computed Assessment Using GP and TW3 Hybrid System

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MON-LB017

Background: Bone age assessments (BAAs) is an important clinical modality to investigate endocrine, genetic and growth disorders in children. It is generally performed by radiological examination of the left hand by using either the Greulich-Pyle (GP) or the Tanner-Whitehouse (TW) method. However, both clinical procedures show several limitations, from significant intra- and inter-operator variability to examination effort of clinicians. To address these problems, several automated approaches have been proposed; nevertheless, some disparity still exists between automated BAAs and manual BAAs to be employed in clinical practice. To overcome this disparity, deep learning-based bone age assess software using GP and TW3 hybrid method has been developed. In this study, we evaluate the accuracy and efficiency of the new automated hybrid

software system for bone age assessment and validate its feasibility in clinical practice. Materials and Methods: Greulich-Pyle (GP) and Tanner-Whitehouse (TW3) hybrid method-based deep-learning technique was used to develop the automated software system for bone age assessment. Total 102 radiographs from children with the chronological age of 4.9-17.0 years (mean age 10.9±2.3, 51 cases for females and 51 cases for males) were selected and bone age was estimated with this software. For validation of the automated software system, three human experts have manually performed BAAs at expert's discretion based on GP method for accuracy estimation and one naïve radiologist performed BAAs with automated software system assist and BAAs reading time was recorded in each session for efficiency evaluation. The performance of automated software system was assessed by comparing mean absolute difference (MAD) between the system estimates and the experts manual BAAs.Results: The results of bone age assessment by human experts and automated software system showed no significant difference between the two groups. Each assessed average of bone age were 11.39 ± 2.74 and 11.35 ± 2.76, respectively. MAD was 0.39 years between automated software system BAAs and experts manual BAAs. The 95% confidence interval of the MAD was 0.33 years and 0.45 years. BAAs reading time was reduced from 56.81 sec (95% confidence interval 52.81 - 60.81 sec) in naïve manual BAAs to 31.72 sec (95% confidence interval 29.74 - 33.69 sec) in automated software system assisted BAAs and statistically significant ($p < 0.001$). MAD showed 0.42 years between naïve manual BAAs and the software-assisted BAAs (95% confidence interval 0.31-0.47 years).Conclusion: The newly developed GP and TW3 hybrid automated software system were reliable for bone age assessments with equivalent accuracy to human experts. Also, the automated system appeared to enhance efficiency by reducing reading times without compromising diagnostic accuracy.

Bone and Mineral Metabolism

BONE DISEASE FROM BENCH TO BEDSIDE

The Relationship Between Estrogen Exposure and Bone Health in Women With Cystic Fibrosis

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SUN-LB72

Patients with cystic fibrosis (CF) are at risk for cystic fibrosis-related bone disease (CFBD) characterized by low bone mineral density and fractures. Nutritional status, cystic fibrosis-related diabetes (CFRD), lung health, and sex hormone insufficiency affect CFBD. CF Foundation guidelines recommend exogenous estrogen treatment for women with CFBD and sex hormone deficiency. There is a lack of data regarding effects of exogenous estrogen supplementation on the bone health of CF women. This Emory IRB approved case-control study examined the association of estrogen on bone health in CF women. Data included demographics, sex hormone treatments, CFBD modifiers, and bone mineral density. 35 estrogen exposed subjects were matched 1:2 to 70 estrogen unexposed subjects for age, BMI, and transplant status. Statistical tests analyzed differences in bone health outcomes between the estrogen and non-estrogen exposed groups. At baseline, age, BMI, transplant status, and CFRD were not statistically different ($p>0.05$) between the two groups. The unexposed group had higher rates of pancreatic insufficiency ($p=0.02$). The exposed and unexposed subjects did not have statistically significant differences in areal bone mineral density at lumbar spine, femoral neck, or total hip ($p>0.05$). Our study demonstrates that there are no differences in bone mineral density at 3 different sites between estrogen exposed versus estrogen unexposed women. One limitation is that factors that may also influence bone density including vitamin D status, family history, and severity of CF mutation were not corrected for. Future longitudinal studies should determine if estrogen treatment can increase bone density over time in CF women.

Neuroendocrinology and Pituitary

ADVANCES IN NEUROENDOCRINOLOGY

Repeated Once-Daily Administration of the Non-Hormonal Neurokinin 1,3 Receptor Antagonist NT-814 Reduces LH, Estradiol and Progesterone in Healthy Women

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SUN-LB58

Introduction: Uterine fibroids (UF) affect up to 25% of women and endometriosis (EM) 10% of women worldwide. An ideal therapy would lower estradiol concentrations to reduce hormonal drive to the endometrium and myometrium, but not to the levels which cause the hot flashes and bone loss associated with current treatments. A target estradiol range of 110-180 pmol/L has been proposed[1]. GnRH secretion is modulated by neurokinin B (NKB) acting at the NK3 receptor via hypothalamic neurons expressing kisspeptin, NKB & dynorphin (KNDy neurons). In addition, Substance P acting at the NK1 receptor may also stimulate reproductive hormone release. We hypothesised that NT-814, a dual NK1,3 receptor antagonist, would reduce GnRH release and hence LH, estradiol and progesterone levels in women. This preliminary clinical study in healthy pre-menopausal women evaluated this hypothesis.

Methods: We undertook a randomized, single-blind, placebo-controlled study. 32 healthy women attended for 2 consecutive menstrual cycles. In each cycle blood samples were taken on days 3/4, 9/10, 15/16 and 21/22 to measure serum sex hormone concentrations. No treatment was given in cycle 1 (baseline). During cycle 2, participants received