

antibodies were within normal limits. Thyroxine binding globulin was low (6 mcg/mL, nl 13 -39). Additional biochemical studies re-demonstrated panhypopituitarism with low LH (<0.12 mIU/mL) and FSH (0.9 mIU/mL). Cortisol was elevated (73.2 mcg/dL) as she had received hydrocortisone. Despite fluid resuscitation and use of vasopressors, her hypotension persisted and she remained in critical condition. She was treated as a case of myxedema coma and started on full replacement dose thyroid hormone with 120 mcg IV levothyroxine daily and liothyronine 5 mcg every 8 hours. Over the next several days, the patient's hemodynamics and mental status improved dramatically. A contrast-enhanced pituitary-protocol MRI was notable for a moderately flattened sella (pituitary 3.5 mm in height) and absence of usual T1 bright signal in the posterior lobe. A work-up for causes of panhypopituitarism was mostly unremarkable: low IgG 4 (0.82, neg <1.50), indeterminate quant gold, negative HIV, low serum iron (35 mcg/dL, nl 50 - 200). Urine toxicology was positive only for opioids, reflective of the patient's chronic pain regimen consisting of MS-Contin 60 mg twice daily and methadone 10 mg twice daily.

Conclusion: This case demonstrates the potential for chronic opioid use to suppress the hypothalamic-pituitary-thyroid axis and highlights the importance of maintaining an index of suspicion for hypothyroidism in this population.

Reference: (1) de Vries, F., Bruin, M., Lobatto, DJ., Dekkers, OM., Schoones, JW., van Furth, WR., Pereira, AM., Karavitaki, N., Biermasz, NR., Najafabadi, AHZ. Opioids and their endocrine effects: A systematic review and meta-analysis. *JCEM*. 2019. Doi: 10.1210/clinem/dgz022

Bone and Mineral Metabolism

BONE DISEASE FROM BENCH TO BEDSIDE

Advanced Glycation Endproducts Are Associated With Worse Bone Material Strength in Older Adults With and Without Type 2 Diabetes

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Patients with Type 2 Diabetes (T2D) are at increased fracture risk despite having relatively normal or even increased BMD by DXA. The critical aspect of bone quality deterioration in T2D patients could explain this clinically important discrepancy. Material composition is a component of bone quality that has emerged as a potential factor contributing to fragility fractures in T2D patients. However, there is sparse evidence regarding whether T2D patients have decreased bone material properties compared with non-diabetic controls. We hypothesized that increased production of advanced glycation endproducts (AGEs) has an important role in reducing bone material strength in patients with and without diabetes. Thus, we used the

OsteoProbe®, a bone microindentation device that provides an index of cortical bone material properties (Bone Material Strength index – BMSi) in men with T2D age ≥ 50 yrs or postmenopausal women with T2D and nondiabetic controls. We also utilized a non-invasive measure of skin AGEs (AGE Reader®) to evaluate AGEs accumulation through skin autofluorescence. Linear regression models were used to assess group differences with and without adjusting for age, Body Mass Index (BMI), and sex. Relationships between variables were assessed using adjusted Pearson correlations. A total of 152 T2D patients (mean age 68.5 ± 7.6 yrs.; 59.2% men; HbA1C=7.7 ± 1.0%; mean diabetes duration 15.5 yrs.) and 105 non-diabetic controls (mean age 67.2 ± 8.8 yrs.; 41.0% men; HbA1C =5.4 ± 0.3%) were recruited to the study. Overall, there was no difference in BMSi between T2DM and control subjects: unadjusted (p= 0.636); adjusted (p= 0.695). However, skin AGEs were negatively correlated with BMSi (r= -0.23, p <0.001). In subgroup analyses, skin AGEs were also negatively associated with BMSi in both T2DM (r= -0.23, p=0.004) and control (r= -0.21, p=0.033) subjects. In conclusion, these findings demonstrate that a higher burden of AGEs is associated with worse bone quality. Our findings may explain the conflicting findings regarding reductions in BMSi in T2D because only T2D patients with a high level of AGEs accumulation have impaired BMSi. Moreover, the association of skin AGEs with BMSi in non-diabetic subjects emphasizes the important role of AGEs in decreasing bone quality and potentially contributing to fracture risk. Collectively, our data indicate that non-invasive skin AGEs measurement could be used as a tool to evaluate bone quality in patients with T2D as well as in the non-diabetic population.

Adrenal

ADRENAL CASE REPORTS III

A Severe Case of Pheochromocytoma Presenting as Classic Takotsubo's Cardiomyopathy With Rapid Resolution

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Abstract

Background: Inverted Takotsubo's cardiomyopathy requiring extra-corporeal membrane support (ECMO) with pheochromocytoma is well described. Classic Takotsubo's cardiomyopathy, however, is rarely described in this setting.

Clinical Case: A 50-year old woman with no previous comorbidities presented with pulmonary edema and cardiogenic shock. She required rapid escalation of vasopressor, inotrope, and intra-aortic balloon pump then ECMO with consideration of cardiac transplant. Initial echocardiogram showed an ejection fraction of 17%. Coronary angiography showed apical ballooning in keeping with classic Takotsubo's cardiomyopathy. Abdominal ultrasound for transplant screening showed a 4.6 cm abdominal mass. Computed tomography confirmed a 4.6 cm mass with classic radiologic features of pheochromocytoma. Plasma free normetaphrine and metanephrine were