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Introduction: Ovarian Hyperthecosis (OH) is a disorder characterized by severe hyperandrogenism and insulin resistance. It is a rare cause of hyperandrogenism primarily among postmenopausal women. We present a case report about a patient with adrenal incidentalomas and later found to have ovarian hyperthecosis during her evaluation.
Case Description: 62-year-old post-menopausal female was referred to the Endocrinology clinic for evaluation of adrenal incidentalomas which were discovered on imaging work-up for hematuria. MRI Abdomen and Pelvis revealed a 17mm right and 14mm left sided adrenal nodules, with signal dropout suggesting benign adenomas. Patient stated she had menopause at age 39 years old, one child, and multiple miscarriages during her reproductive years. Examination revealed BMI of 31.1 kg/m^2, moderate hirsutism, and skin tags near the neck. There was no evidence of hyperpigmentation or abdominal striae. Patient had phenotype suggestive of insulin resistance-without diagnosis of diabetes.
Results: Laboratory workup revealed normal levels of 24-hour metanephrines, cortisol, renin, aldosterone, and DHEA-S suggesting that the adrenal adenomas were not hyperfunctioning. Further workup revealed: Total Testosterone: 220 *[2 - 45 ng/dL]*; Free Testosterone 23.8 *[0.1 - 6.4 pg/mL];* DHEA-S 43 [*12 - 133 mcg/dL]*. Prolactin 6.3 *[Postmenopausal 2.0-20.0 ng/mL]*. A1c 5.4 *[<5.7%]*. Serum FSH, LH, PRL, and IGF-1 were within normal reference ranges. The patient, with adrenal adenomas, elevated testosterone, and a normal DHEA-S suggested a non-adrenal source. Patient was evaluated by OB/GYN with finding of normal postmenopausal ovaries on transvaginal ultrasonography. Based on a high suspicion for OH, patient underwent hysterectomy with bilateral salpingo-oophorectomy which confirmed pathological diagnosis of Bilateral OH. On follow-up 2 months post-op, Total/Free Testosterone had normalized 36 *[2 - 45 ng/dL]* and 3 *[0.1 - 6.4 pg/mL]* respectively).
Conclusion: In women presenting with elevated testosterone (>150 ng/dL) and clinical features of hyperandrogenism, proper laboratory and imaging evaluation is imperative to determine the source of excess androgen production. Untreated, OH is associated with increased mortality from type 2 diabetes, cardiovascular disease, and endometrial carcinoma. The diagnosis of OH can be confirmed only by histologic examination of the ovaries. Often, ovarian imaging is negative, therefore, surgical intervention is recommended. Hence, clinicians should rely on the clinical assessment in making management decisions in patients with OH.

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REPRODUCTIVE HEALTH CASE REPORTS

Post Menopausal Hyperandrogenism: A Case of a Steroid Cell Tumor of the Ovary

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Introduction: Postmenopausal hyperandrogenism is a rare condition that causes hirsutism, virilization, and clitoromegaly that should be carefully evaluated in order to avoid overlooking an androgen secreting tumor (1).
Case: A 48 year old African American female with a prior history of polycystic ovarian syndrome (PCOS) presented for evaluation of hirsutism. Of note, she also underwent menopause at age 41 after receiving chemotherapy for a history of multiple myeloma, and she has been on steroids since the time of her diagnosis. On exam, she had thick, dark hair growth on her chin, upper lip, and chest, as well as male-patterned baldness, acne, easy bruising, proximal muscle weakness, deep voice, and elevated blood pressure. Prior to endocrinology evaluation, she was started on spironolactone 25 mg BID. Lab work up included dehydroepiandrosterone sulfate (DHEAS) 73 mcg/dL (27-240 mcg/dL), 17-hydroxyprogesterone 74 ng/dL (31-455 ng/dL), androstenedione 271 ng/dL (30-200 ng/dL), total testosterone 763 ng/dL (8-60 ng/dL), bioavailable testosterone 244 ng/dL (0.8-10 ng/dL), hemoglobin A1c 4.3%, follicle stimulating hormone 30 IU/L, luteinizing hormone 23.9 IU/L, insulin 11 mcIU/mL (2.6-24.9 mcIU/mL), glucose 71, insulin-like growth factor 1 236 ng/mL (44-227 ng/mL) with subsequent normal glucose suppression test. While transvaginal ultrasound did not note any abnormal findings, a computed tomography of the abdomen/pelvis showed a new hyperdense focus in the left ovary as well as a tiny right adrenal nodule, most likely an adenoma. Follow up magnetic resonance imaging confirmed a 1.6 cm enhancing solid left ovarian mass; it also confirmed a right adrenal adenoma and left adrenal thickening versus a tiny adenoma. Urine metanephrines and catecholamines were normal. Patient had total hysterectomy and bilateral oophorectomy; pathology showed a steroid cell tumor.
Conclusion: Postmenopausal hyperandrogenism has several causes: insulin resistance, PCOS, non-classic congenital adrenal hyperplasia, medications, and tumors of the ovaries or adrenals. Severe hyperandrogenemia should raise the suspicion of an ovarian or adrenal neoplasm, necessitating prompt imaging (1). Certain imaging may not reveal smaller masses, and additional imaging or ovarian/adrenal vein sampling may be needed. Typically, an elevated DHEAS with a high testosterone suggests an adrenal source, while androstenedione can be elevated in both glands. Once identified, the involved gland is surgically resected. This patient was found to have a steroid cell tumor, which has malignant potential. They make up less than 0.1% of all ovarian tumors (2). Initial treatment is surgical resection and may necessitate chemotherapy if malignant.
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Pre-Eclampsia Strikes: Could It Be Related This Gland?

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Introduction: Primary hyperparathyroidism (PHPT) is rarely diagnosed in pregnancy and if left untreated has the potential to lead to serious maternal and neonatal complications. We describe a case of PHPT with associated complicated pre-eclampsia. Clinical Case29-year-old primigravida admitted at 33 + 6 weeks with fatigue, 10lbs weight gain and elevated BP. Labs revealed potassium 2.9 (3.5-5.2mmol/L), corrected serum calcium (Ca)11.62 (8.4-10.2mg/dL), ionized calcium 1.69 (1.15-1.33mmol/L), PTH 163.9 (15-65pg/mL) and vitamin D 24.6 (30-100ng/mL). Other labs were normal. Urine studies showed 315mg/24h proteinuria and urine calcium of 129.5 mg/24hrs (100-300mg/24hrs). She was started on magnesium sulphate along with labetalol for BP control, given betamethasone for stimulation of fetal lung maturity as well as potassium repletion. Hypercalcemia (HCa) was initially managed with fluids and Lasix intravenously. At 34 + 2 weeks she developed SOB, orthopnea, headaches with new 9lbs weight gain over 5 days and sustained BP elevation. Urgent C-section was done for pre-eclampsia with severe features. Post-operatively, she suffered from postpartum hemorrhage, managed with transfusion of packed red cells and transient placement of a Bakri balloon. Her HCa worsened with Ca 12.56 and cinacalcet was started after delivery. This coincided with gradual improvement of her BP and Ca to 10.8. She declined additional work-up and was discharged in stable condition. Clinical LessonPHPT often goes undiagnosed in pregnancy, with symptoms of fatigue and constipation mimicking common complaints of pregnancy. Studies have also suggested that up to 25% of patients with PHPT during pregnancy present with hypertension and pre-eclampsia and that there is an association between preeclampsia and the presence of parathyroid adenomas. The pathophysiology is unclear but is thought to be due to endothelial dysfunction triggered by hypercalcemia as well as abnormal placentation. No clear guidelines exist for the management of PHPT during pregnancy, with observation and rehydration being the preferred initial options. The use of cinacalcet as well as curative surgical parathyroidectomy when Ca levels persist >11 in the second trimester have also been described. Our patient presented similarly, with severe pre-eclampsia needing urgent C-section, further complicated by persistent severe HCa. Early diagnosis of PHPT, along with treatment including cinacalcet improved her Ca. It is therefore important that PHPT be considered in patients presenting like ours, progressing to severe pre-eclampsia as early reduction of serum calcium may reduce morbidity and mortality. ReferencesMcCarthy, A., Howarth, S., Khoo, S., Hale, J., Oddy, S., Halsall, D., ... & Samyraju, M. (2019). Management of primary hyperparathyroidism in pregnancy: a case series. *Endocrinology, diabetes & metabolism case reports*, *2019*(1).

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Primary Hyperparathyroidism in Pregnancy - Two Case Reports.

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Introduction: Primary hyperparathyroidism in pregnancy is rare, with a reported incidence of 1%. The physiological changes of pregnancy can mask its diagnosis. Primary hyperparathyroidism is characterized by the overproduction of parathyroid hormone (PTH) and results in hypercalcemia and a raised or inappropriately normal PTH.

Maternal and fetal/neonatal complications are estimated to occur in 67 and 80% of untreated cases respectively. Maternal complications include nephrolithiasis, pancreatitis, hyperemesis gravidarum, pre-eclampsia and hypercalcemic crises. Fetal complications include intrauterine growth restriction; preterm delivery and an increased risk of miscarriage.

Case reports

Case 1: An 18-year old woman presented in her first pregnancy with a known history of MEN type 1. She was diagnosed at the age of 17 following an appendectomy. She has a strong family history and subsequent genetic test confirmed the diagnosis of MEN1. Pre-pregnancy parathyroid sestamibi scan showed bilateral parathyroid adenoma. MRI pituitary was in keeping with a pituitary microadenoma. She had a corrected calcium ranged between 2.7-3.3mmol/L and an inappropriately raised PTH of 24.1pg/ml. She underwent elective parathyroidectomy at 15 week gestation. Post operatively she remained normocalcaemic. She subsequently developed gestational diabetes and was induced at 34 + 3 weeks due to multiple episodes of hypoglycaemia, reduced fetal movement and suspected placental insufficiency. She had a good fetal outcome.

Case 2: A 29-year-old woman in her first pregnancy presented with recurrent episodes of renal colic and imaging confirmed significant bilateral renal calculi. A diagnosis of primary hyperparathyroidism was made with adjusted calcium of 2.94 mmol/L (2.20-2.60) and inappropriately unsuppressed parathyroid hormone of 20.1pg/ml (1.6-6.9), along with ultrasound parathyroid. She was managed with fluid rehydration initially and parathyroidectomy was performed at 12 weeks due to persistently elevated serum calcium. Her genetic screening for MEN (multiple endocrine Neoplasia) was negative. Fetal growth was closely monitored and the rest of her pregnancy was uncomplicated. She had an assisted vaginal delivery at term with good fetal outcome.

Learning Points: 1. The physiological changes of pregnancy can mask its diagnosis; hence a high index of suspicion is needed to diagnose primary hyperparathyroidism in pregnancy.2. Management with rehydration forms the cornerstone in mild cases and Parathyroidectomy is the definitive treatment and recommended in second trimester.

3. Ultrasound is the only recommended imaging modality in pregnancy.4. Primary hyperparathyroidism can be genetically determined in 10% of cases. Genetic testing enables patients to be screened for the development of other syndrome-related diseases e.g. neuroendocrine tumours in MEN1.