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All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.
Gestational hyperandrogenism: A case report

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Abstract

**Background:** Gestational hyperandrogenism is a rare situation causes virilization features such as; hirsutism, acneiform eruptions, temporal alopecia, clitoral hypertrophy, deepening of the voice. A female infant arising from this mother exhibits virilization symptoms while male infant doesn't. We find this case appropriate to offer why it is a rare gestational hyperandrogenism case and draw attention to importance of cutaneous manifestations in diagnosis.

**Case report:** A 34 weeks pregnant applied for generalized itching and rashes. Her examination was detected common acneiform eruptions, temporal alopecia, hirsuitism and deepening of the voice. Modified Ferriman-Gallwey hirsutism score was found as 20. Her serum total testosterone level was 3162.87 ng/dl (14.2-73.1) and β-HCG was 461928.1 nU/ml. Her ultrasound was demonstrated bilateral ovarian multicystic appearance and she was diagnosed as gestational bilateral ovarian theca-lutein cysts. She wasn't given any treatment except topical erythromycin for acneiform eruptions. After delivery she was followed up for spontaneous resolution of theca-lutein cysts.

**Conclusion:** This case was important for diagnosing a rare gestational hyperandrogenism case starting from cutaneous symptoms. Therefore, gestational hyperandrogenism requires a multidisciplinary approach and the skin lesions contribute to its diagnosis markedly.
Introduction

Gestational hyperandrogenism is a rare situation occurs with increase in production or activity of androgen hormones. Both mother and female infant exhibit virilization features while male infant doesn't.

This case is appropriate to offer why is a rare gestational hyperandrogenism case and draw attention to the importance of the cutaneous manifestations in its diagnosis.
Case report

A 23-year-old, 34 weeks pregnant woman admitted to dermatology outpatient clinic. She was complaining about generalized itching and rashes for a month. She was taking propylthiouracil for hyperthyroidism and dieting for gestational diabetes. Otherwise, she wasn’t taking any other medication for any disease.

Her dermatological examination was revealed temporal alopecia, common acneiform eruptions, clitoral hypertrophy, deepening of the voice and hirsutism (Figure 1) with a Modified Ferriman-Gallwey hirsutism score of 20. Her laboratory parameters was normal, except total testosterone (T) was 3162.87 ng/dl (14.2-73.1) and β-HCG was 461928.1 nU/ml. So she was diagnosed as gestational hyperandrogenism and a punch biopsy was taken from acneiform eruptions.

She was consulted to obstetrics and gynecology department. At her obstetric ultrasonography, fetal biometry was compatible with 34 weeks of pregnancy. This ultrasonographic evaluation was demonstrated bilateral ovarian multicystic appearance like theca-lutein cysts. She was consulted for the endocrinological evaluation and her bilateral adrenal ultrasonography was normal.

The pathological examination of skin biopsy was showed; epidermal spongiosis, lymphocyte exocytosis, single-cell necrosis, mild acanthosis, neutrophilic infiltration at epidermal part of sweat gland, duct and perivascular mononuclear cell infiltration including eosinophils at the neighboring superficial dermis and acneiform eruption (Figure 2a). Topical erythromycin treatment was given to acneiform eruptions.

She was delivered by cesarean section at 39 weeks of gestation. In operation, bilateral theca-lutein cysts were observed (Figure 2b). The male newborn was 2810g and hadn’t any virilization features. Ovarian theca-lutein cysts were followed up for spontaneous regression.
Discussion

Skin especially the pilosebaceous units have various hormone receptors and the ability of synthesize different hormones, as reported previously ¹. Stress, steroid hormones, retinoids and the nuclear hormone receptors are published by Rosenfield et al ², to play important roles in skin physiology. Androgen hormones take part in growth and differentiation of the sebaceous gland, hair growth, epidermal barrier, homeostasis and wound healing.

Zouboulis et al. ³ indicated that, androgens cause growth of hair follicles at androgen-dependent armpits, pubic region and beard area, on the contrary adrogens cause alopecia on the scalp by reducing anagen stage hair follicle. The reason why pilosebaceous units respond differently, at different parts of the body has not fully understood yet.

The most active androgen hormone dihydrotestosterone (DHT) shows its effect by binding to the androgen receptors at papilla cells ⁴. Zouboulis et al. ⁵, compared patients with acne to healthy individuals and found more T and DHT are produced in their skin. Therefore it has been suggested that isolated elevations of plasma DHT and androstanediol glucuronide may be a biochemical indicative of cutaneous androgen metabolism.

The most common reasons of gestational hyperandrogenism are luteoma and ovarian theca-lutein cysts, following by the use of exogenous progesterone or androgen, placental aromatase deficiency, Sertoli-Leydig cell tumor, etc. Androgen hormone excess can be seen in 30% of the theca-lutein cysts, in previous reports ⁶-⁷. Wang et al. ⁸ reported a luteoma of pregnancy case, both mother and female infant showing virilization signs. Virilization is a rare manifestation of hyperandrogenism and the presence of virilization signs as reported by Yildiz et al. ⁹, usually brings to mind an androgen hormone-producing tumor. Morris et al. ¹⁰ published an adrenocortical carcinoma case, both mother and female infant exhibiting virilization signs.
In this case, hirsutism, acne, temporal alopecia, deepening of the voice and clitoral hypertrophy which were started in pregnancy supported hyperandrogenism accompanied by virilization. At this point ultrasonography was beneficial for differential diagnosis. Luteomas – which are 50% bilateral- are solid tumors, krukenberg tumors are solid and usually bilateral, too. Other ovarian tumors are usually unilateral. Ultrasonography is useful for in distinction of ovarian and adrenal tumors. In our case bilateral ovarian multicystic appearance was diagnosed as ovarian theca- lutein cysts.
Conclusion

Gestational hyperandrogenism is a rare condition that requires a multidisciplinary approach. Skin symptoms lead for evaluation and ultrasonography helps for differential diagnosis.
Consent

Written informed consent was obtained from patient for publication of this case study and accompanying the images for scientific purposes.
References


Figure legends

1. (a) Temporal alopecia, acneiform eruptions and hirsuitism
   
   (b) Acneiform eruptions and hirsuitism
   
   (c) Clitoral hypertrophy

2. (a) Epidermal spongiosis, lymphocyte exocytosis, single-cell necrosis, mild acanthosis, neutrophilic infiltration at epidermal part of sweat gland duct and perivascular mononuclear cell infiltration including eosinophils at the neighboring superficial dermis and acneiform eruption
   
   (b) Cesarean section view with bilateral ovarian theca-lutein cysts, the right ovary was 150x70x30mm and the left ovary was 130x60x30mm