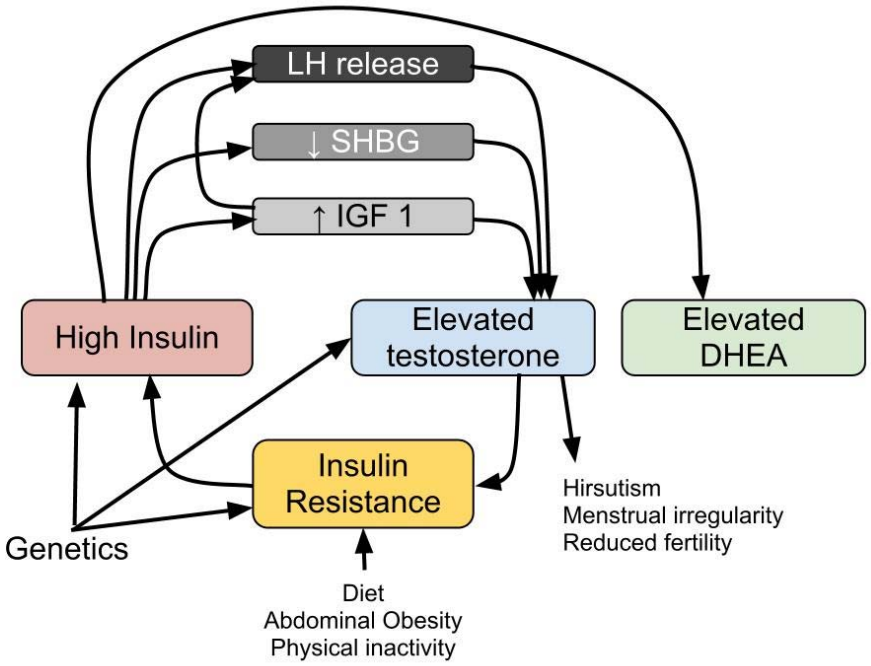

***Exploring the Relationship Between Androgens and Insulin***

A CDC report from 2009 estimates that 34.4% of Americans meet the criteria for metabolic syndrome and this prevalence increases with age. There are some slightly varying criteria for diagnosing metabolic syndrome depending on who is defining it, although most organizations, including the World Health Organization and the International Diabetes Federation, agree that blood sugar dysregulation, elevated blood pressure, elevated triglyceride levels, low HDL and abdominal adiposity are the primary determining factors. Additionally, we often see elevated androgen hormones including DHEA and testosterone in female patients, along with the symptoms that correlate with increases in these hormones including increased facial and body hair and or scalp hair loss.

The increase in bioavailable testosterone and/or DHEA can often be a very early marker of blood sugar dysregulation and be evident before we see elevations in fasting glucose or even fasting insulin levels. Elevations in salivary androgens are a sensitive marker of fluctuating blood sugar and subsequent insulin levels. Insulin increases androgen levels through a variety of mechanisms including:

- Increasing LH release which stimulates the theca cells in the ovaries to produce testosterone
- Decreasing sex hormone binding globulin (SHBG) rendering more of the testosterone available for tissues
- Increasing the available insulin like growth factor (IGF-1) which in turn acts similarly to insulin by stimulating thecal cells directly and increasing LH.

In addition to the stimulation of androgens in the ovaries, insulin also stimulates production of androgen hormones from the adrenal glands although the exact mechanism for this is still somewhat unknown.




The most common place we see the relationship between insulin and the androgen hormones is in patients who have been diagnosed with polycystic ovarian syndrome (PCOS), although the connection may not be exclusively in this population. While women who fall into the diagnostic criteria for PCOS likely have an increased sensitivity to insulin, higher testosterone levels are also seen in postmenopausal women with metabolic syndrome and insulin resistance.

Understanding the underlying mechanisms behind the elevations you may find in

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Understanding the underlying mechanisms behind the elevations you may find in salivary testosterone and/or DHEA levels is important when it comes to forming a comprehensive treatment plan. In addition to supporting adrenal function and balancing estrogen and progesterone ratios, plans that include diet and lifestyle modifications as well as nutrition and herbs to support healthy blood sugar metabolism will address the underlying etiology of the elevated androgens, resulting in both successful achievement of your clinical goals and happy, hormone-healthy clients.

**Resources**


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