ELEVATED TESTOSTERONE LEVEL

Hyperandrogenemia, Hyperandrogenism

The presence of elevated testosterone concentration within the circulating blood.

♀ Symptom ♂ Male & Female

About Elevated testosterone level

High concentration of testosterone within the blood may underline the presence of some reproduction related diseases, especially in women. Testosterone is not influencing only reproduction related features of the body (such as menstruation, spermatogenesis and others physiological processes), but it also affects metabolism, growth and others physiological aspects which are not directly related but still affects the reproduction (e.g. adipose tissue growth).

The production of testosterone within the body takes place in the gonads and the adrenal glands. Elevated concentration of free testosterone (testosterone circulating in blood) in women is to be connected with some non-reproductive disorders such as hirsutism, nevertheless it is often also signaling reproduction related disorders such as polycystic ovary syndrome and closely related anovulation. There is also a relation between specific hormone-dependent cancer types and high testosterone levels, like in case of breast cancer.

Regarding reproduction related disorders, the focus on testosterone levels in males is most often studied in relevance to prostate cancer. It should be mentioned, that not only the free (blood) concentration of testosterone matters. For example, in case of prostate cancer, testosterone concentration is measured not only as blood concentration, but also from a tissue sample (testosterone tissue concentration).

PCOS, Anovulation

Polycystic ovary syndrome (PCOS) most commonly develops because of the elevated production of androgens, such as the testosterone. The increased production of
testosterones within the female body may be due to excessive luteinizing hormone (LH) production by the anterior pituitary gland. Second reason of increased androgen production may be the presence of high insulin concentration within the blood, called hyperinsulinemia, and closely related metabolic syndrome (Pic. 1). The balance of reproductive hormones can be also disturbed by thyroidal dysfunction. Regarding elevated testosterone levels in the blood, it is worth to mention the hyperthyroidism. That’s the state when the thyroidal gland produces too much of thyroid hormones. This increased production of thyroid hormone raises up the androgen production. In any case, high concentration of androgens (testosterone) in blood prevents the evolvement of ovary follicles and the menstruation to take place (anovulation) and so called ovarian cyst (usually immature follicles) are created (PCOS).

**Breast cancer**

Breast cancer includes a heterogeneous group of tumours that differ in clinical behaviour, response to therapy, and outcome. It is being referred as a hormone-dependent cancer, meaning that its growth is affected by specific hormones, in this case by the testosterone concentration. The measurement of levels of testosterone may help to specify the subtype of the breast cancer, since various breast cancer types are connected with elevated testosterone concentrations.

**Prostate cancer**

There is not yet well established role of testosterone regarding the prostate cancer, the data collecting on this theme vary substantially. Nevertheless, it seems, that high concentration of free testosterone may serve as a prevention to the development of prostate cancer (low concentration of blood testosterone is to be connected with higher risk of prostate cancer development; e.g. in older men). On the other hand, high concentration of testosterone found in tissue is to be connected with more severe case of prostate cancer. The high concentrations of testosterone within the prostate tissue corresponds with higher Gleason score (a score defining the gravity of cancer development; the higher Gleason score, the more severe development stage of a cancer).

**Find more about related issues**

- **Diagnoses**
  - **Polycystic ovary syndrome**
    Polycystic ovary syndrome is a condition in which a woman has an imbalance of female sex hormones and cysts in the ovaries.
    Learn more at: [www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome](http://www.fertilitypedia.org/therapy/diag/polycystic-ovary-syndrome)
Anovulation
Failure of the ovaries to release an oocyte over a period of time generally exceeding 3 months.
Learn more at: [www.fertilitypedia.org/therapy/diag/anovulation](http://www.fertilitypedia.org/therapy/diag/anovulation)

Pic. 1: The prevalence of closely related disorders (PCOS, Hyperandrogenemia and metabolic syndrome) within a sample of 1900 women suffering from obesity

The figure shows the close relation between obesity, overproduction of androgens and consecutive development of PCOS.

Sources

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