ELEVATED LH LEVEL

A condition with high serum luteinizing hormone (LH) concentration.

Symptom  Male & Female

About Elevated LH level

Luteinizing hormone (LH) is a hormone produced by gonadotropic cells in the anterior pituitary gland. In females, an acute rise of LH ("LH surge") triggers ovulation and development of the corpus luteum. In males, where LH had also been called interstitial cell-stimulating hormone (ICSH), it stimulates Leydig cell production of testosterone. It acts synergistically with follicle-stimulating hormone (FSH).

During the reproductive years, relatively elevated LH is frequently seen in patients with polycystic ovary syndrome (PCOS); however, it would be unusual for them to have LH levels outside of the normal reproductive range.

Persistently high LH levels are indicative of situations where the normal restricting feedback from the gonad is absent, leading to a pituitary production of both LH and FSH. While this is typical in menopause, it is abnormal in the reproductive years (see Gonadal dysgenesis and Hypogonadism below).

Congenital adrenal hyperplasia

Congenital adrenal hyperplasia (CAH) is an autosomal recessive disorder stemming from one of the enzymatic defects in the biosynthesis of cortisol from cholesterol. This defect causes excessive androgen production from adrenal source, which leads to virilization with varying degrees of severity in female fetuses. Elevated LH level is found in certain forms of congenital adrenal hyperplasia.

Gonadal dysgenesis

Gonadal dysgenesis is any congenital developmental disorder of the reproductive system characterized by a progressive loss of germ cells on the developing gonads of an embryo. This loss leads to extremely hypoplastic (underdeveloped) and dysfunctioning gonads mainly composed of fibrous tissue, hence the name streak gonads - i.e., the ovary is replaced by functionless tissue. Due to lack of ovary/testis response, the LH level is elevated.

- **Swyer syndrome** also called XY gonadal dysgenesis is a type of hypogonadism in a person whose karyotype is 46,XY. The person is externally female with streak gonads, and if left untreated, will not experience puberty. Due to the inability of the streak gonads to produce sex hormones (both estrogens and androgens). Evaluation of delayed puberty usually reveals elevation of gonadotropins, indicating that the pituitary is providing the signal for puberty but the gonads are failing to respond.
- **Turner syndrome** is a condition in which a female is partly or completely missing an X chromosome. Signs and symptoms vary among those affected. Elevated LH is a result of gonadal defects.
- **XX gonadal dysgenesis** is a type of female hypogonadism in which no functional ovaries are present to induce puberty in an otherwise normal girl whose karyotype is found to be 46,XX. With nonfunctional streak ovaries she is low in estrogen levels (hypoestrogenic) and has high levels of FSH and LH.

Hypogonadism

Hypogonadism describes a diminished functional activity of the gonads – the testes and ovaries in males and females, respectively – that may result in diminished sex hormone biosynthesis. Hypogonadism could be primary or secondary, while although secondary hypogonadism is associated with low LH levels, primary
hypogonadism is related to elevated level of LH and FSH. This type affects testosterone production – the inhibition of LH production is insufficient; hence, FSH and LH levels are elevated.

- **Androgen insensitivity syndrome** is an example of a hypogonadism resulting from the lack of hormone response where there are inadequate receptors to bind the testosterone, resulting in a female appearance despite XY chromosomes.
- **Hypergonadotropic hypogonadism** is a condition which is characterized by hypogonadism due to an impaired response of the gonads to the gonadotropins, FSH and LH, and in turn a lack of sex steroid production and elevated gonadotropin levels (as an attempt of compensation by the body).
- **Klinefelter syndrome** also known as 47,XXY or XXY, is the set of symptoms that result from two or more X chromosomes in males. The primary feature is sterility and due to defect gonads the LH level is elevated.

**Pregnancy**

Human chorionic gonadotropin (hCG) hormone is produced by fetal placenta at the time of pregnancy. This gonadotropin consists of two moieties: an alpha moiety that is similar to FSH, LH, and thyroid stimulating hormone (TSH), and a beta moiety that is unique to human chorionic gonadotropin. Beta-hCG is a hormone found in the mother’s blood serum that can be used to help interpret ultrasound findings. Beta hCG can mimic LH so tests may show elevated LH levels.

**Polycystic ovary syndrome (PCOS)**

Polycystic ovary syndrome (PCOS), the most common endocrine disorder among women of reproductive age, is characterized by the coexistence of hyperandrogenism, ovulatory dysfunction, and polycystic ovaries (PCO).

The cause of LH hypersecretion in PCOS is probably due to enhanced pituitary sensitivity to gonadotropin releasing hormone (GnRH) or to changes in GnRH secretion patterns rather than increased GnRH secretion. It appears to be a result of an acquired impaired sensitivity of the hypothalamic pulse generator to the negative feedback of estrogen and progesterone in PCOS, possibly by chronic estrogen exposure. Levels of FSH in PCOS appear to be low or within the lower follicular range, and response to GnRH is relatively similar to ovulatory controls. Altered sex steroid production, metabolic dysfunction, and obesity may all contribute to the changes in LH secretion pattern.

**Premature ovarian failure (POF)**

Premature ovarian failure is described as the loss of function of the ovaries before age 40. POF is diagnosed or confirmed by high blood levels of FSH and luteinizing hormone (LH) on at least three occasions at least four weeks apart. The anterior pituitary secretes FSH and LH at high levels due to the dysfunction of the ovaries and consequent low estrogen levels.

**Find more about related issues**

**Diagnoses**

**Polycystic ovary syndrome**
A condition in which a woman has an imbalance of female sex hormones. This may lead to changes in the menstrual cycle, cysts in the ovaries, trouble g
Learn more at: [www.fertilypedia.org/therapy/diag/polycystic-ovary-syndrome](http://www.fertilypedia.org/therapy/diag/polycystic-ovary-syndrome)

**Sources**

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