INCREASED LEVEL OF FSH

High FSH Level

A condition with high serum follicle-stimulating hormone (FSH) concentration.

About Increased level of FSH

Follicle-stimulating hormone (FSH) in the organism together with LH is responsible for follicular growth and maturation of eggs. If the ovaries are not working, FSH levels rise. The most common reason for high serum FSH concentration is in a female who is undergoing or has recently undergone menopause. High levels of follicle-stimulating hormone indicate that the normal restricting feedback from the gonad is absent, leading to an unrestricted pituitary FSH production. Increased level of FSH, indicates low ovarian reserve, and women with high FSH have significantly lower pregnancy chances with in vitro fertilization (IVF) than women with normal FSH levels.

Unlike women, in men FSH levels remain relatively constant. Its presence in males is necessary for the maturation of spermatozoa. In men high FSH levels are due to primary testicular failure. This can be the result of developmental defects in testicular growth or to testicular injury. They can also indicate the presence of Klinefelter syndrome or a genetic disorder.

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. The accompanying hormonal failure also prevents the development of secondary sex characteristics in either sex, resulting in a sexually infantile female appearance and infertility. The first type
of gonadal dysgenesis discovered was Turner syndrome.

- **Turner syndrome**
  Turner syndrome (TS) is defined as the total or partial absence of the second sex chromosome in women. A large proportion, 40-50% of Turner girls have at least some pubertal development, and about 10% may undergo menarche. Ovarian follicles have been found in some 40% of teenagers with Turner syndrome. Serum concentrations of antimullerian hormone (AMH) and follicle stimulation hormone (FSH), karyotype with mosaicism or structural chromosomal abnormalities, and spontaneous onset of pubertal development are positive prognostic signs for the presence of oocytes and ovarian function. Premature ovarian failure (POF) at some age can be expected in most of Turner women. Most adult women with Turner syndrome already have established ovarian failure with high serum follicle-stimulating hormone (FSH) levels at the time they wish to start a family. Patients are usually guided towards egg donation.

- **Swyer syndrome**
  Simple 46, XY gonadal dysgenesis syndrome, also called Swyer syndrome, is known as pure gonadal dysgenesis. Individuals with the syndrome are characterized by 46, XY karyotype and phenotypically female with female genital appearance, normal Müllerian structures and absent testicular tissue. The condition usually first becomes apparent in adolescence with delayed puberty and primary amenorrhea due to the gonads have no hormonal or reproductive potential. Swyer syndrome is congenital cause of Hypergonadotropic hypogonadism (HH). HH is a condition which is characterized by hypogonadism due to an impaired response of the gonads to the gonadotropins, follicle-stimulating hormone (FSH) and luteinizing hormone (LH), and in turn a lack of sex steroid production and elevated gonadotropin levels (as an attempt of compensation by the body).

**Poor ovarian reserve**

Poor ovarian reserve: (also known as impaired ovarian reserve, premature ovarian aging or declining ovarian reserve) is a condition of low fertility characterized by low numbers of remaining oocytes in the ovaries or and possibly impaired preantral oocyte development or recruitment. Recent research suggests that premature ovarian aging and premature ovarian failure (aka primary ovarian insufficiency) may represent a continuum of premature ovarian senescence. It is usually accompanied by high FSH (follicle-stimulating hormone) levels.

**Premature ovarian failure**

Premature ovarian failure (POF) is a primary ovarian defect characterized by absent menarche (primary amenorrhea) or premature depletion of ovarian
follicles before the age of 40 years (secondary amenorrhea). It is a heterogeneous disorder affecting approximately 1% of women <40 years, 1:10,000 women by age 20 and 1:1,000 women by age 30. The most severe forms present with absent pubertal development and primary amenorrhea (50% of these cases due to ovarian dysgenesis), whereas forms with post-pubertal onset are characterized by disappearance of menstrual cycles (secondary amenorrhea) associated with premature follicular depletion. As in the case of physiological menopause, POF presents by typical manifestations of climacterium: infertility associated with palpitations, heat intolerance, flushes, anxiety, depression, fatigue. POF is biochemically characterized by low levels of gonadal hormones (estrogens and inhibins) and high levels of gonadotropins (LH and FSH) (hypergonadotropic amenorrhea).

**Testicular failure**

The term hypogonadism is usually applied to permanent rather than transient or reversible defects, and usually implies deficiency of reproductive hormones, with or without fertility defects. The term is less commonly used for infertility without hormone deficiency. There are many possible types of hypogonadism and several ways to categorize them. Hypogonadism is also categorized by endocrinologists by the level of the reproductive system that is defective. Physicians measure gonadotropins (LH and FSH) to distinguish primary from secondary hypogonadism. In primary hypogonadism the LH and/or FSH are usually elevated, meaning the problem is in the testicles, whereas in secondary hypogonadism, both are normal or low, suggesting the problem is in the brain.

**Klinefelter syndrome**

The term Klinefelter syndrome (KS) describes a group of chromosomal disorder in which there is at least one extra X chromosome to a normal male karyotype, 46,XY. The primary feature is sterility. Often symptoms may be subtle and many people do not realize they are affected. Sometimes symptoms are more prominent and may include weaker muscles, greater height, poor coordination, less body hair, smaller genitals, breast growth, and less interest in sex. Individuals will often have a low serum testosterone level but high serum follicle-stimulating hormone (FSH) and luteinizing hormone (LH) levels.

**Systemic lupus erythematosus**

Systemic lupus erythematosus (SLE), also known simply as lupus, is an autoimmune disease in which the body’s immune system mistakenly attacks healthy tissue in many parts of the body. Symptoms vary between people and may be mild to severe. Common symptoms include painful and swollen joints, fever, chest pain, hair loss, mouth ulcers, swollen lymph nodes, feeling tired, and a red rash which is most commonly on the face.
Systemic lupus erythematosus affecting male fertility. SLE patients have a low sperm count and low mobility sperm. Sperm abnormalities are related to elevated levels of FSH.

Find more about related issues

.solve

organs

Ovary
The ovum-producing organs of the internal female reproductive system
Learn more at: www.fertilitypedia.org/edu/organisms/ovary

Pituitary gland
An endocrine gland, about the size of a pea, whose secretions control the other endocrine glands and influence growth, metabolism, and maturation.
Learn more at: www.fertilitypedia.org/edu/organisms/pituitary-gland

Diagnoses

Turner syndrome
Turner syndrome is a genetic disorder in which a female is partly or completely missing one X chromosome that results in ovarian dysgenesis.
Learn more at: www.fertilitypedia.org/therapy/diagnosis/turner-syndrome

Klinefelter syndrome
The set of symptoms that result from two or more X chromosome in males.
Learn more at: www.fertilitypedia.org/therapy/diagnosis/klinefelter-syndrome

Premature ovarian failure
The loss of function of the ovaries before age 40.
Learn more at: www.fertilitypedia.org/therapy/diagnosis/premature-ovarian-failure

Poor ovarian reserve
A condition of low fertility characterized by low numbers of remaining oocytes in the ovaries or possibly impaired oocyte development or recruitment.
Learn more at: www.fertilitypedia.org/therapy/diagnosis/poor-ovarian-reserve
**Testicular failure**
The inability of the testicles to produce sperm or testosterone.
Learn more at: [www.fertilitypedia.org/therapy/diag/testicular-failure](http://www.fertilitypedia.org/therapy/diag/testicular-failure)

**Lupus erythematosus**
Collection of autoimmune diseases in which the human immune system becomes hyperactive and attacks normal, healthy tissues.
Learn more at: [www.fertilitypedia.org/therapy/diag/lupus-erythematosus](http://www.fertilitypedia.org/therapy/diag/lupus-erythematosus)

**Swyer syndrome**
A rare disorder characterized by a phenotypic female with an XY karyotype.
Learn more at: [www.fertilitypedia.org/therapy/diag/swyer-syndrome](http://www.fertilitypedia.org/therapy/diag/swyer-syndrome)

**Gonadal dysgenesis**
Any congenital developmental disorder of the reproductive system characterized by a progressive loss of germ cells on the developing gonads.
Learn more at: [www.fertilitypedia.org/therapy/diag/gonadal-dysgenesis](http://www.fertilitypedia.org/therapy/diag/gonadal-dysgenesis)

---

**Sources**


"Klinefelter syndrome and other sex chromosomal aneuploidies ([http://www.ojrd.com/content/1/1/42](http://www.ojrd.com/content/1/1/42))" —by Visootsak and Graham licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0)

"Clinical Presentation of Klinefelter's Syndrome: Differences According to Age ([http://www.hindawi.com/journals/ije/2012/324835/](http://www.hindawi.com/journals/ije/2012/324835/))" —by Pacenza et al. licensed under [CC BY 3.0](https://creativecommons.org/licenses/by/3.0)

"Premature ovarian failure ([https://www.researchgate.net/publication/7059365_Premature_ovarian_failure](https://www.researchgate.net/publication/7059365_Premature_ovarian_failure))" —by Beck-Peccoz and Persani licensed under [CC BY 2.0](https://creativecommons.org/licenses/by/2.0)

"Follicle-stimulating hormone ([https://en.wikipedia.org/wiki/Follicle-stimulating_hormone](https://en.wikipedia.org/wiki/Follicle-stimulating_hormone))" —sourced from *Wikipedia* licensed under [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0)


“Ovarian function and in vitro fertilization (IVF) in Turner syndrome. (http://www.ncbi.nlm.nih.gov/pubmed/22946282)” —by Hovatta licensed under CC0 1.0


“Hypogonadism (https://en.wikipedia.org/wiki/Hypogonadism)” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Dysgerminoma in a case of 46, XY pure gonadal dysgenesis (Swyer syndrome): a case report (http://diagnosticpathology.biomedcentral.com/articles/10.1186/1746-1596-6-84)” —by Han et al. licensed under CC BY 2.0

“Poor ovarian reserve (https://en.wikipedia.org/wiki/Poor_ovarian_reserve)” —sourced from Wikipedia licensed under CC BY-SA 3.0

“Male fertility potential alteration in rheumatic diseases: a systematic review (http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1677-55382016000100011)” —by Tiseo et al. licensed under CC BY 4.0