

Difference Between FSH and LH

www.differencebetween.com

Key Difference - FSH vs LH

Follicle stimulating hormone (FSH) and Luteinizing hormone (LH) are commonly referred to as gonadotropins. They involve in the stimulation of germ cells in the production of gametes in both males and females. Both hormones are essential during reproductive processes carried out by the body. They are synthesized and secreted by the gonadotropic cells of the anterior pituitary. **FSH stimulates the formation of gametes which takes place in the primary sex organs whilst LH doesn't involve.** This is the **key difference** between FSH and LH.

What is FSH?

Follicle stimulating hormone is a hormone that involves in the regulation of growth and development, puberty and different reproduction processes of the body. FSH is a polypeptide hormone. It is commonly considered as a gonadotropin. Gonadotropic cells present in the anterior pituitary synthesize and secrete FSH. FSH has effects on both males and females. It mainly involves in the maturation of germ cells in both females and males. In females, FSH has many different functions. In the menstrual cycle, FSH initiates the growth of follicular cells which specifically affects the granulose cells. At the late follicular phase, FSH levels are reduced due to the secretion of hormone inhibin. This initiates the ovulation stage with the most advanced follicle. FSH levels slightly increase at the end of luteal phase which led to the initiation of the next menstrual cycle.

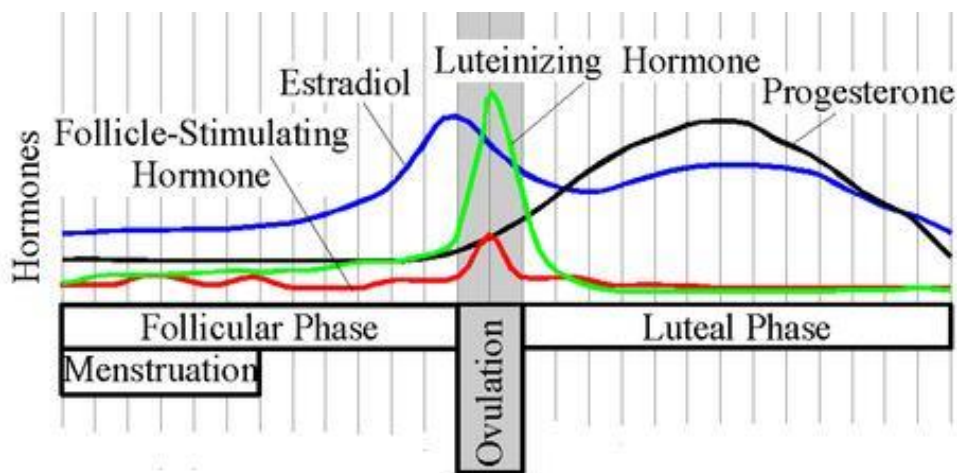


Figure 01: FSH in Estradiol cycle

FSH is an important hormone present in males. It stimulates the Sertoli cells to release ABPs (androgen binding proteins). This regulates the process of spermatogenesis due to the release of inhibin hormone. Females who are undergoing or have reached menopause have a high level of serum FSH concentration. High levels of FSH indicate that the normal feedback level from gonads are absent and therefore, an uncontrolled FSH production from the pituitary is taken place.

When there is a high level of FSH during the years of reproduction, it is considered abnormal. Instances, where there is a high level of FSH, include premature ovarian failure, premature ovarian aging, gonadal dysgenesis and Turner Syndrome. A low level of FSH results in a failure of the gonadal function. This condition is significant to males as a failure in the production of the normal sperm count may occur. Low levels of FSH in females results in polycystic ovarian syndrome, Polycystic Ovarian Syndrome along with Obesity, Hirsutism and Infertility, Hypothalamic suppression and Kallmann syndrome.

What is LH?

Luteinizing hormone is produced by the gonadotrophic cells in the anterior pituitary. LH is released from the pituitary and controlled by gonadotropin-releasing hormone. LH is considered as a heterodimeric glycoprotein. There is a glycoprotein molecule in each of the monomeric units having one alpha and one beta making a fully functional protein. In females, theca cells in the ovaries are supported by LH. The rise in LH causes the development of corpus luteum and ovulation is triggered. In males, LH is called as an interstitial cell stimulating hormone (ICSH). It stimulates the production of testosterone by Leydig cells.

LH normally acts with FSH synergistically. LH is regulated by the hormone gonadotropin-releasing hormone (GnRH). LH acts on Leydig cells of the testis to produce testosterone under the regulation of the enzyme 17β -hydroxysteroid dehydrogenase which converts androstenedione to testosterone. High levels of LH indicate that the normal feedback level from gonads is absent and an uncontrolled LH production from the pituitary is taken place. This situation maybe normal in menopause but, is abnormal during the years of reproduction. Therefore, instances such as premature menopause, gonadal dysgenesis, and Turner syndrome may take place.

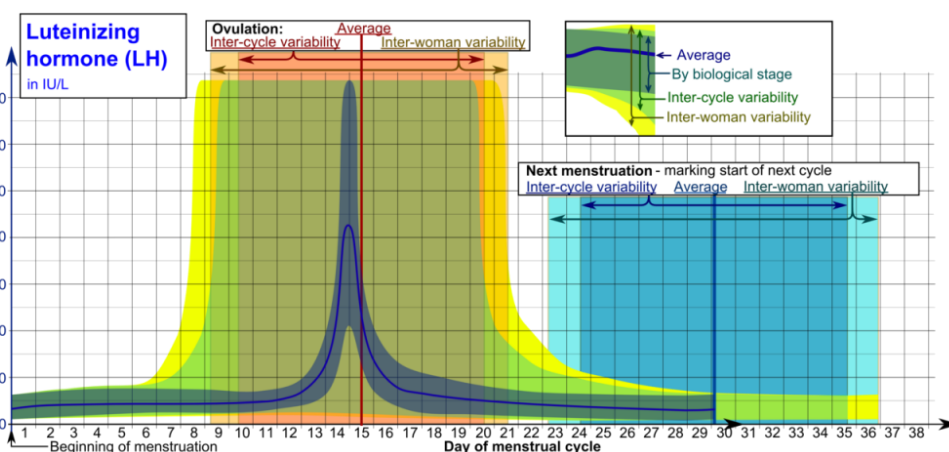


Figure 02: LH

Low secretion of LH may result in failure of the gonadal function. This may also be typical in males as a failure in a normal number of sperm production may occur. In females, the condition of amenorrhea may be observed. In low LH secretion conditions such as Pasqualini syndrome, hypothalamic suppression and Kallmann syndrome may occur.

What is the Similarity Between FSH and LH?

- Both FSH and LH act synergistically on each other.

What is the Difference Between FSH and LH?

FSH vs LH	
Follicle Stimulating Hormone(FSH) is a polypeptide hormone that involves in the regulation of growth and development, puberty and different reproduction processes of the body.	<i>Luteinizing hormone</i> (LH) is a hormone produced by gonadotropic cells in the anterior pituitary gland
Development of primary sex organs	
FSH involves in the development of primary sex organs.	LH has no specific function during the development of primary sex organs.
Gamete Formation	
Gamete formation is stimulated by FSH which take place in the primary sex organs.	LH is not involved during the formation of gametes.
Menstrual cycle	
The first half of the menstrual cycle is controlled by FSH.	The second half of the menstrual cycle is controlled by LH.
Secretion of estrogen	
FSH stimulates the secretion of estrogen.	LH does not stimulate the secretion of estrogen.
Ovulation	
FSH does not involve in the process of ovulation.	LH is a key hormone during ovulation.
Effects on Corpus Luteum	
FSH has no effect on corpus luteum.	LH involves in the development of corpus luteum, especially in its secreting phase.
Production of Androgens	
FSH has no effect on the production of androgens.	LH acts on Leydig cells which stimulate the production of androgens.

Summary - FSH vs LH

FSH and LH are gonadotropic hormones since they are synthesized and secreted by the gonadotropic cells of the anterior pituitary. LH is considered as a heterodimeric glycoprotein. There is a glycoprotein molecule in each of the monomeric units having one alpha and one beta making a fully functional protein. Follicle stimulating hormone is a hormone that involves in the regulation of growth and development, puberty, and different reproduction processes present in the body. FSH is a polypeptide hormone while LH is considered a heterodimeric glycoprotein. This is the difference between FSH and LH. Both FSH and LH act synergistically on each other.

Reference:

1. Kumar, Pratap, and Sameer Farouk Sait. "Luteinizing hormone and its dilemma in ovulation induction." Journal of Human Reproductive Sciences, Medknow Publications Pvt Ltd. [Available here](#)
2. Bremner, William J., et al. "Follicle-Stimulating Hormone and Human Spermatogenesis." The Journal of Clinical Investigation, American Society for Clinical Investigation, 1 Oct. 1981. [Available here](#)
3. Raju, Gottumukkala Achyuta Rama, et al. "Luteinizing hormone and follicle stimulating hormone synergy: A review of a role in controlled ovarian hyper-Stimulation." Journal of Human Reproductive Sciences, Medknow Publications & Media Pvt Ltd, 2013. [Available here](#)

Image Courtesy:

1. 'Estradiol.Cycle'By Ekem at English Wikipedia -Transferred from en.wikipedia to Commons by Drguttorm. ([CC BY-SA 3.0](#)) via [Commons Wikimedia](#)
2. 'Luteinizing hormone (LH) during menstrual cycle'By Mikael HäggströmT (Public Domain) via [Commons Wikimedia](#)

How to Cite this Article?

APA: Difference Between FSH and LH. (2017, October 16). Retrieved (date), from <http://differencebetween.com/difference-between-fsh-and-vs-lh/>

MLA: " Difference Between FSH and LH" Difference Between.Com. 16 October 2017. Web.

Chicago: "Difference Between FSH and LH." Difference Between.Com. <http://differencebetween.com/difference-between-fsh-and-vs-lh/> accessed (accessed [date]).



Copyright © 2010-2017 Difference Between. All rights reserved