Estimation of LH and FSH

Dep. Medical laboratories techniques,
University of Al Maarif

Lab -7- Clinical endocrinology

Msc. Sumaya Nadhim

Luteinizing Hormone (LH)

Is a heterodimeric glycoprotein -

.consists of one alpha and one beta subunit -

LH is produced mainly in gonadotropic cells in the anterior -

.pituitary gland

LH works in conjunction with follicle stimulating hormone (FSH) -

to control the menstrual cycle. The LH surge triggers ovulation and the development of corpus luteum in females. LH promotes

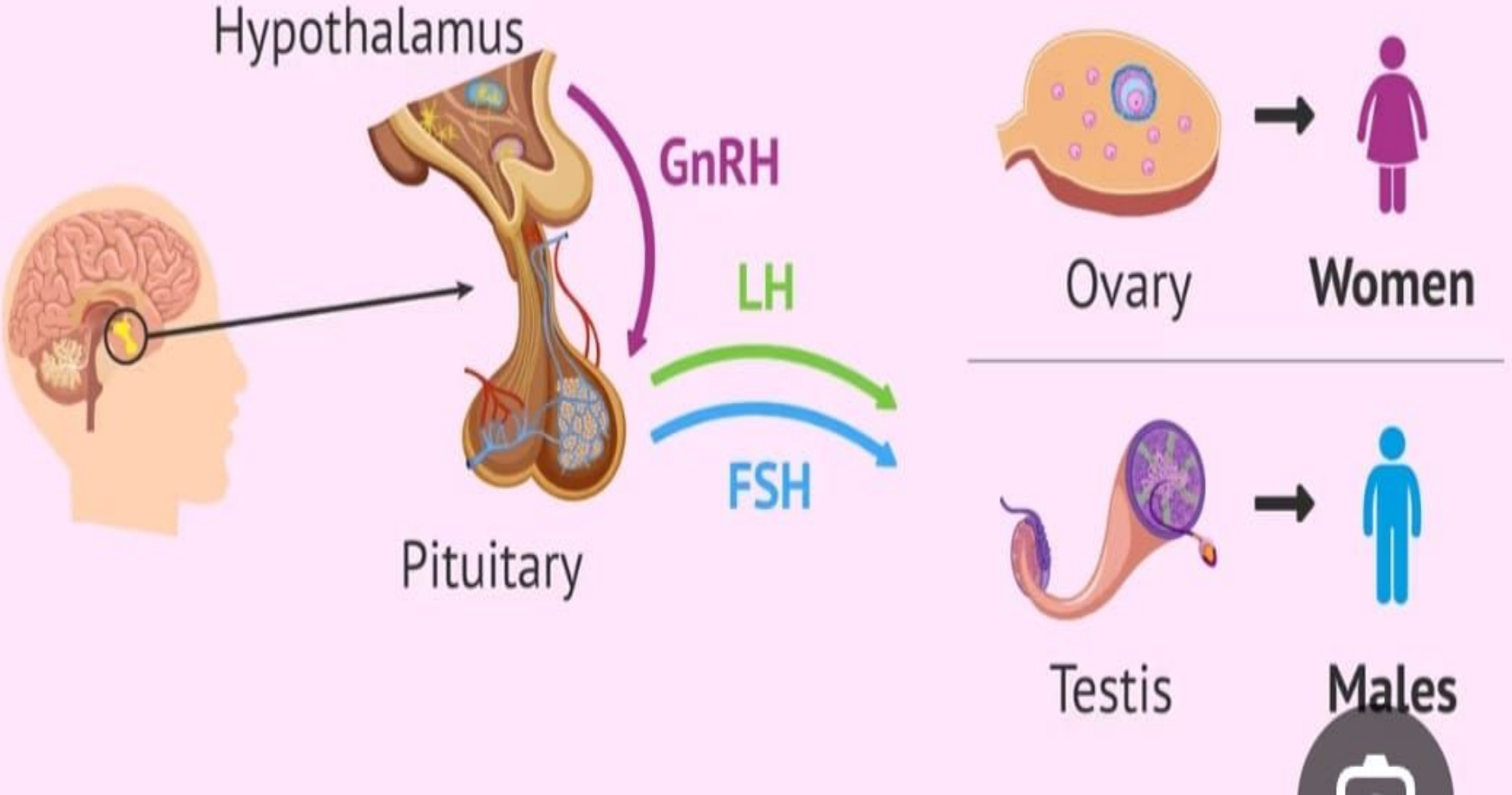
.testosterone production by Leydig cells of testes in males

LH levels in blood can be affected by dysfunctions within the -
.hypothalamus-pituitary-gonad system

Together with FSH, LH is used as a biomarker for congenital-
diseases with chromosome aberrations (e.g., Turner's syndrome)
.and polycystic ovaries (PCO)

In addition, LH is used to investigate suspected Leydig cell -
insufficiency as well as causes of amenorrhea and menopausal
.syndrome

Luteinizing Hormone



Normal LH ranges and what they mean

Normal ranges in men -

.For males, the normal range is **1.24–7.8 IU/L**

If LH levels are below the normal range, it may indicate a pituitary gland problem. Their pituitary gland may not be making enough .LH, which may lead to low testosterone

If LH levels are too high, the testes may not be responding to LH properly. LH may not be triggering testosterone production in the .way that it should

Normal ranges in women -

For females, the normal range depends on where they are in their :menstrual cycle, as follows

follicular phase, or the beginning of the cycle: **1.68–15 IU/L** -

mid-cycle peak, around the middle of the cycle: **21.9–56.6 IU/L** -

luteal phase, which is the end of the cycle: **0.61–16.3 IU/L** -

For females who have gone through menopause, the normal range - .is **14.2–52.3 IU/L**

If LH levels are higher than normal when a person is not ovulating, they may be experiencing menopause. High LH levels may also indicate a pituitary disorder or polycystic .ovary syndrome

:**If the LH** levels are lower than normal, it may indicate

Malnutrition-

anorexia-

stress-

a pituitary disorder-

Normal ranges in children

For girls who are yet to go through puberty (aged around 1–10 .years), the normal range is **0.03–3.9 IU/L**

:LH is involved in the following bodily processes

Puberty: LH levels affect the onset of puberty. High LH levels may .cause early puberty and low LH levels may delay puberty

Menstruation: LH works with another sex hormone called .follicle-stimulating hormone (FSH) to control menstrual cycles

Ovulation: An increase in LH, called an LH surge, triggers the .release of an egg from an ovary

Progesterone release: An increase in LH triggers ovulation. The cell structure that is left after ovulation releases progesterone. .Progesterone is needed to maintain a pregnancy

Testosterone production: LH binds to Leydig cells in the testes and triggers testosterone production. Testosterone levels affect sex .drive

Sperm production: Testosterone, which LH levels affect, is needed for sperm production

Follicle-Stimulating Hormone (FSH)

It is a hormone that plays a significant role in sexual development - and reproduction by affecting the function of the ovaries and testes. . It works alongside luteinizing hormone (LH)

.It is a hormone pituitary gland makes and releases-

Despite its name, follicle-stimulating hormone doesn't directly- affect your hair follicles or hair growth. A special group of .hormones called androgens affects hair growth

FSH got its name due to its effect on ovarian follicles, which are- .small sacs filled with fluid that contain egg cells in the ovaries

FSH function in fetal development

In the second and third trimesters of pregnancy (week 13 to the end of week 26 and week 27 to the end of the pregnancy, respectively), the fetus's pituitary gland releases FSH and luteinizing hormone .(LH)

These hormone levels peak midpregnancy as the first ovarian follicle or seminiferous tubule (coiled tubules within the testes) .mature in the fetus

FSH function during puberty

FSH levels are normally low in children. As puberty approaches (usually between ages 10 and 14), the hypothalamus produces gonadotropin-releasing hormone (GnRH), which triggers FSH and .LH

In males, FSH and LH work together to trigger the testes to begin producing testosterone. This is the hormone responsible for the physical changes of puberty (such as body hair growth and voice .deepening) and the production of sperm

In **females**, FSH and LH trigger the ovaries to begin producing estrogen. This hormone is responsible for physical changes of .puberty, like breast development and menstruation

FSH function in menstruating females

Ovulation is a phase in the menstrual cycle. It occurs on about day 14 of a 28-day menstrual cycle. Specifically, ovulation is the .release of the egg (ovum) from an ovary

Each month, between days six and 14 of the menstrual cycle, FSH causes follicles in one of the ovaries to begin to mature. However, during days 10 to 14, only one of the developing follicles forms a fully mature egg. At about day 14 in the menstrual cycle, a sudden surge in LH causes the mature follicle to rupture and release its egg .(ovulation)

After ovulation, the ruptured follicle forms a corpus luteum (a temporary endocrine gland) that produces high levels of progesterone. Progesterone blocks the release of FSH and helps .prepare the uterine lining for pregnancy

FSH function in males

For males, FSH stimulates sperm production. In collaboration with testosterone inside the testes, which is triggered by LH, FSH also .sustains sperm production

Normal FSH levels for males

Before puberty: 0 to 5.0 milli-international units per milliliter -

.(mIU/mL)

.During puberty: 0.3 to 10.0 mIU/mL -

.Adult: 1.5 to 12.4 mIU/mL -

Normal FSH levels in females

.Before puberty: 0 to 4.0 mIU/mL-

.During puberty: 0.3 to 10.0 mIU/mL-

.After puberty: 4.7 to 21.5 mIU/mL-

.After menopause: 25.8 to 134.8 mIU/mL-

?What conditions are associated with high FSH levels

.hypergonadotropic-hypogonadism, or primary hypogonadism -

.primary ovarian insufficiency (POI) or testicular failure-

?What conditions are associated with low FSH levels

hypogonadotropic-hypogonadism -

.by issues with pituitary gland or hypothalamus -

Thank you for listening