



❖ Semen:-

- 10% sperms
- 90% secretions that promote sperm survival and fertility "accessory glands": (60% → seminal vesicle, 20% → prostate, 10% → mucus glands especially the bulbourethral glands)

** semen contents:

- fructose "nourishment"
- enzymes
- amino acids
- acids
- electrolytes

Hyaluronidase → lyse the tissue around the ovum

Some of the semen enzymes tend to work on the ovum rather than the sperm such as proteolytic enzymes and Hyaluronidase enzyme

clotting enzymes → from the prostate "diff. from those of blood"

→ to prevent the loss of the ejaculated semen, and to buy time for the capacitation process to occur)

** semen clots after entering the vagina, and it's lysed by fibrinolysin enzyme

❖ Reproductive dysfunction:

- Semen analysis: "3-5 days after sexual abstinence"
 - **volume** → 3.5 ml "ranges b/w 1-7"
 - **sperm count** → 100 million sperm/ml "ranges b/w 20-120 million sperm/ml"
 - ** less than 20 million = Oligospermia
 - ** Azospermia = no sperms at all.
 - **Motility** → 70% "ranges b/w 65-75%"
 - **morphology** → Normal morphology should be found in more than 70% (ranging b/w 65-75%).
 - **2ry liquefaction** → 15-30 minutes,
 - ** if more than 1 hour → male may be infertile, bcz sperm will become immotile.
 - **Fructose content** → 2.2 g/L
 - ** No inflammatory cells or any blood elements should be found in semen.

After ejaculation the semen clots, and after few minutes it liquefies

The male ejects a large number of sperms. So that a sufficient amount can reach the fertilization site "0.001%", within 30-60 minutes after ejaculation, and one of them can be able to penetrate and fertilize the ovum.

- Side effect of testosterone injection:
 - ↓ LH "-ve feedback" → ↓ testosterone produced from natural sources → homosexuality.

❖ Female reproductive system:

- hormones regulate most of the physiological actions in the reproductive tract.

The ovum in the female is surrounded by a follicle. It starts as primordial follicle and differentiates to → unilaminar primary follicle → multilaminar primary follicle → secondary follicle → graafian mature follicle. We will reach all these stages before ovulation. In the primary multilaminar follicle will start having 2 types of cells: theca interna + granulosa.

- Theca interna → have receptors for LH, induce making androgens!!
- Granulosa cells → have the (aromatase enzyme)
 - "absorb" the androgens produced by theca interna cells

Estradiol can't be produced from testosterone bcz the enzyme responsible for this process -**aromatase enzyme**- is missing from theca interna cells

- **Actions will take place in granulosa cells under the effect of FSH:-**
 - 1- Testosterone → estradiol **by** aromatase enzyme
 - 2- Androstenedione → testosterone **by** 17β-HSD enzyme, **then** to estradiol **by** aromatase enzyme!!
 - 3- Androstenedione → estrone **by** aromatase **then** to estradiol **by** 17β-HSD enzyme!!

- **Under the effect of LH: "in luteal phase"**

- progesterone is produced from cholesterol.
- progesterone passes to theca interna cells and by LH it's converted to androstenedione.
- theca interna & granulosa cells work as one functional unit.

Progesterone can't produce androstenedione in the granulosa cells because the enzyme required for this -Desmolase enzyme- is absent

❖ Regulation of the reproductive tract in the female:

- Factors → stim. Brain centers → stim. Hypothalamus → release GnRH & dopamine
→ stim. Ant. Pituitary → release prolactin & (LH & FSH)

A) prolactin → (1) inhibitory effect, producing hormones from ovaries
→ inhibit pregnancy "50% of women using prolactin can't be pregnant"
(2) Prolactin induces milk formation in nursing mothers "50% can't be pregnant"

B) FSH/LH → stimulatory effect on ovaries to produce androgens, estradiol and progesterone, regulate follicular steroidogenesis, androgen and estradiol secretion.

** LH regulates the secretion of progesterone from the corpus luteum

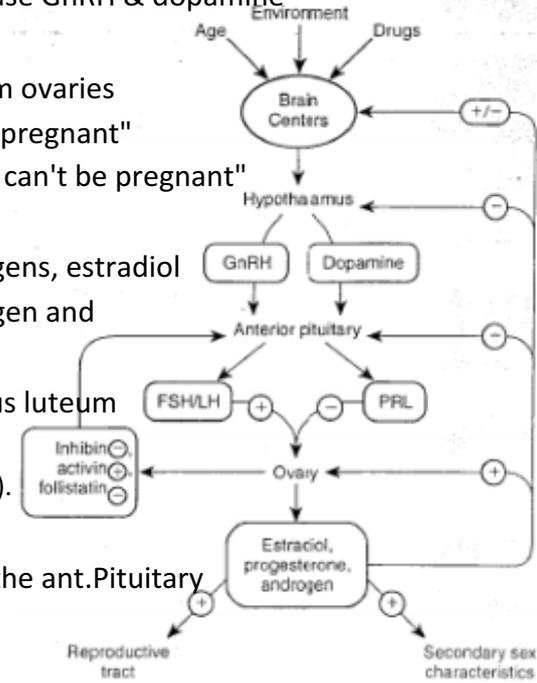
** Androgens, estradiol, and progesterone have -ve feedback effect on the anterior pituitary (They inhibit the release of FSH /LH).

** Ovaries also produce Inhibin, Activins, and Follistatins

** Inhibin and Follistatin → -ve feedback on FSH release from the ant. Pituitary

** Activin → increases the secretion of FSH.

** Their activity is confined to the reproductive system



Inhibins and Activin can be produced from granulosa cells, pituitary, brain, adrenal glands, kidney, bone marrow, corpus luteum and placenta.

❖ Ovaries, hormones, and reproductive system cycles:-

- **Ovaries** → primary sex organs in the female produce (estrogen & progesterone) & ova.
- **Estrogens** →, development of 2ry sex characteristics and sex organs at female puberty.
- **Progesterone** → a pregnancy hormone.
- **Ovum** → surrounded by a follicle.
- in **reproductive life** → 90% to 95% of all follicles are found as primordial follicles
- in **fetal life** and **childhood** → some develop to primary follicles, but then they degenerate.

ovum قصة ال

Follicle and ova formation starts early in the fetal life, at the 30th week of gestation 7 million ova are present in the two ovaries. 2 million of them will be present at birth and the others will degenerate. Only 300,000 - 400,000 will be available at puberty. During all the reproductive years (13-50 years old) about 450 ova are ovulated, one each month substituting between the two ovaries (if the first ovary ovulates in this month, the second ovary will ovulate in the next month and so on - but this rule could be broken)

- There are two cycles that occur in the female reproductive system at puberty:

A- Ovarian cycle

B- Uterine cycle

** When these two cycles begin, they don't stop until reaching **menopause** (except pregnancy and diseases).

** They occur regularly every 28 days.

** The ovarian cycle **dominates** the uterine cycle → that means if the ovarian cycle didn't occur then the uterine cycle won't occur either.

** 1st day of the menstrual cycle = menses "when women bleeds"

** in day 14 → ovulation occurs.

❖ Past papers: 3 لكل شيء متعلق في محاضرة 3

1- in a typical 28 day menstrual cycle, all true except:

→ day 14-28 is variable from cycle to another. "**Luteal phase is constant**"

2- Wrong about human reproductive systems:

→ in both sexes, gonadotropin release is non-cyclic

3- Most important androgen for extra glandular estrogen production:

→ androstenedione

4- Wrong about male reproductive system regulation:

→ Activin stimulates FSH and LH release.

**5- A couple is failing to have children, not a method for diagnosing the problem:

→ not sure (maybe measuring progesterin levels three times in the cycle)

other choices were (measuring LH everyday through the cycle, measuring basal body temperature, sperm count, testing for anti-sperm antibodies in the wife)

**6- Wrong about the menstrual cycle :

→ primary follicles only develop at puberty to menopause (maybe) other choices (follicles are activated few days before beginning of the cycle, activation is genetically determined and lack of hormones won't affect it, almost all non-growing follicles are primordial, sometimes no ovulation happens although the cycle started normally)

7- which of the following is wrong relating the menstrual cycle:

→ most changes occur in the period b/w day 14-28 "**cause changes occur before ovulation**"

8- one of the following is the most important phase in menstrual cycle:

→ All have the same importance <3 <3

9- the most dominant phase in menstrual cycle:

→ انت و حظك المفروض هاد سؤال ما إله جواب ، سو أنا بحكي يتشخص C

→ "unless there was all of the above answer"

10- what is common b/w sertoli cells & granulosa cells:

→ – primarily stimulated by FSH "be careful , if he asked about theca & granulosa → LH"

11- The ovum → is important in the cyclic action of the uterine.

12- the wrong statement regarding the human chronic gonadotropin (HCG):

→ it is released by the corpus luteum

13- diagram for the menstrual cycle hormones , so reorder them

estrogen, progesterone, FSH, LH

→ 3 then 1 then 4 then 2

نشكر كل اللي كتبوا الشيتات لأنه لولاهم لما طلع هيك ملخص فهم مصدرنا الأول و الأخير
حاولنا يكون بنفس ترتيب و تنسيق الشيت و يشمل أكثر من 90%
سامحونا على أي تقصير