URO-GENITAL SYSTEM

Urogenital System ... Doctor 2013

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- ○ Anatomy
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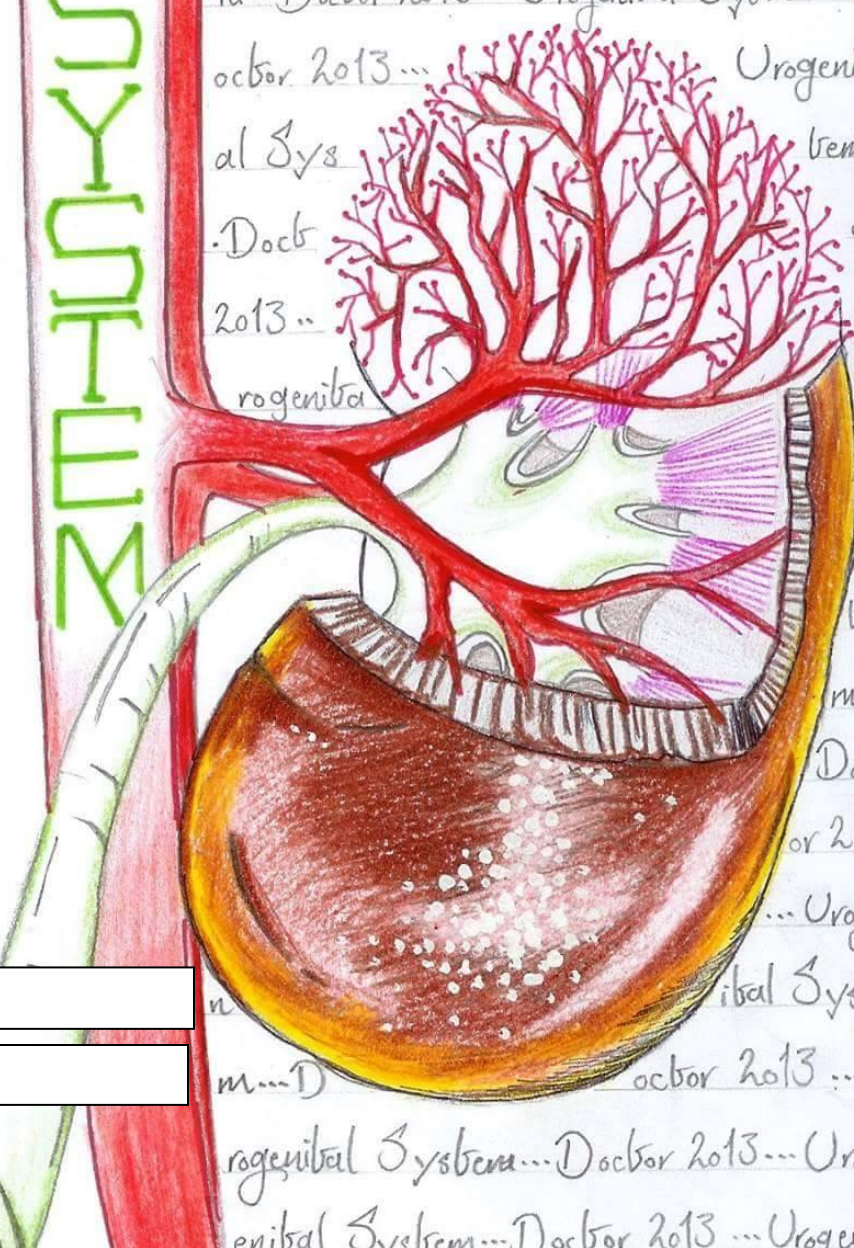

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Lec. #: 4

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Female Reproductive System

Female Reproductive Cycles

There is 2 cycles in the female:

1- The ovarian cycle
2- The uterine cycle

The ovarian cycle dominates the uterine cycle, which means if there is no ovarian cycle, there is no uterine cycle.

The ovarian cycle is divided into 3 phases:

1- Follicular phase.
2- Ovulation which happens on day 14 if the cycle is 28 days.
3- Luteal phase.

Follicular phase:

Begins with activation of the primordial follicles, and this has nothing to do with hormones, it's genetically determined.

Then it continues growing to become primary follicle, one of those follicles is selected, which is the dominant follicle that matures and ovulates.

The ovulated body is called the corpus luteum that continues to grow and secrets progesterone and estrogen.

If there is no pregnancy it regresses after 2 weeks, becomes the corpus albicans that disappears within 2 months.

Sometimes the ovarian cycle doesn't end in ovulation, and this is called unovulatory cycle, which occurs mainly at the beginning of menarche and beginning of menopause. There will be no progesterone because there is no ovulation, thus no corpus luteum, and this makes the cycle shorter than normal; sometimes 28 days.

The Uterine cycle:

Which is also called the endometrial cycle, and Is divided into 3 phases:

1- Menstrual phase.
2- Proliferative phase.
3- Secretory phase.

At the end of the ovarian cycle, estrogen and progesterone levels in the blood are almost zero.

And because of this, two results happen:

1- Blood vessels supplying the endometrium will become necrotic, which causes the shedding of the endometrium (there is no blood supply).
2- Sloughing of the endometrial layer.

The doctor read from the slide:

Withdrawal of estrogens and **progestins**:

Progesterone and hydroxyprogesterone are both considered as progestins.

Just before menses two effects happen because of the withdrawal of estrogen and progestins:

1- Induction of catastrophic degeneration of endometrium that leads to menstrual phase.

2- From endocrine, the fall of their levels diminshes the feedback inhibition on the hypothalmic-pituitary system, thus gonadotropin hormones, FSH and LH, level rise which permits the beginning of next menstrual cycle.

Menstrual Phase:

Duration is 4-5 days in average, can be normally from 1 to 8 days.

Blood quantity is 30 ml, and can range from spots up to 80 ml, any blood more than this is abnormal, and could be according to genetic factors and the thickness of endometrium.

Proliferative phase: (The uterus here prepares itself for the next cycle, for pregnancy).

Uterine glands elongate, blood vessels develop to supply the endometrium that is thickening, this phase coincidences with high estrogen level in the blood, could be called estrogen phase.

Secretory phase:

Progesterone is produced here as well as estrogen, all the changes from the last phase deepen here, also called (progesterone phase).

The doctor read the following slide:

Relation to endocrine function.

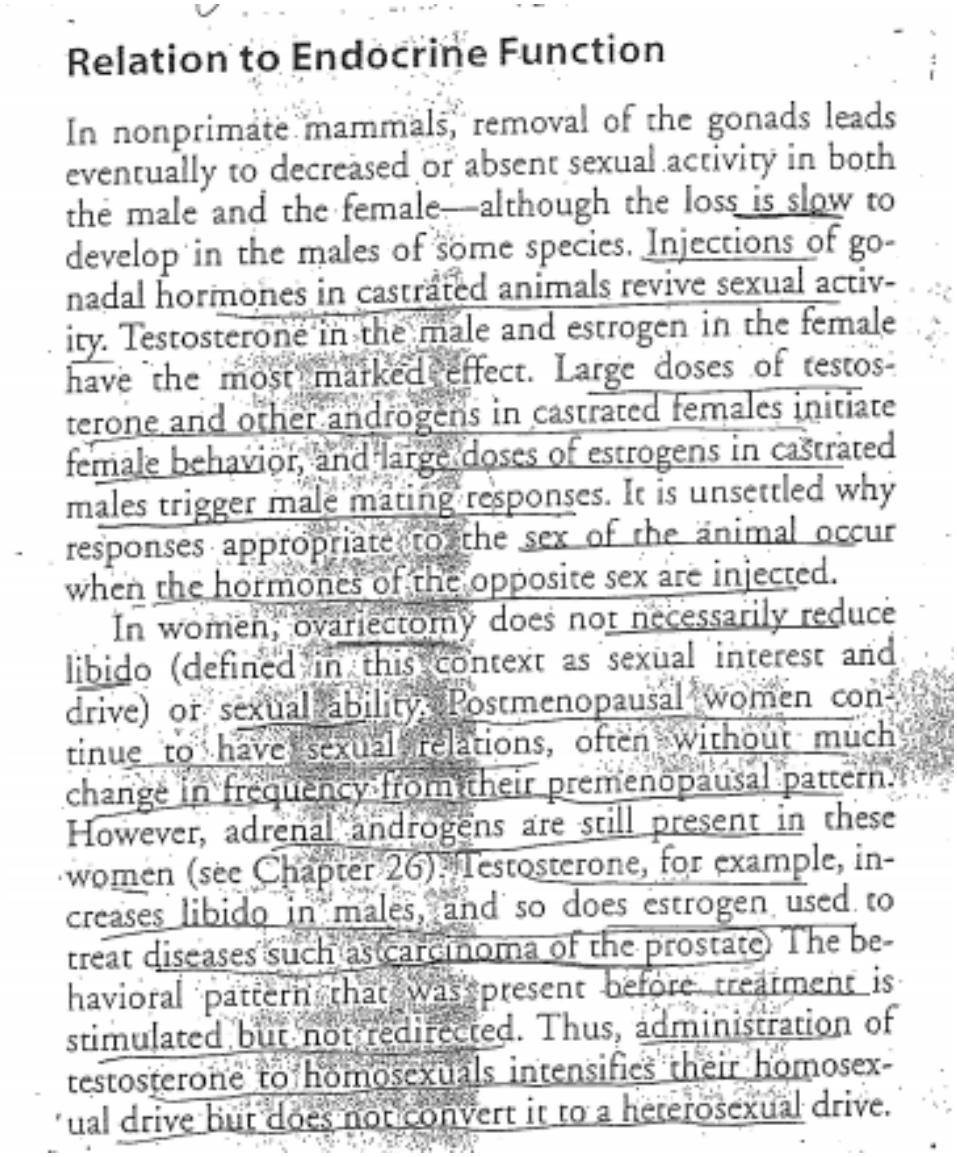
Notes on the slide:

1- All these experiments are done on animals (such as rabbits, rats, and sheep) not humans.

2- It is not "unsettled why responses ...." as written in slides, it is actually settled, because both estrogen and testosterone are produced in both males and females.

3- Menopause only means that women can't get children anymore, this has nothing to do with the sexual activity.

4- Homosexual drive is either Genetic or habitual.



Relation to Endocrine Function

In nonprimate mammals, removal of the gonads leads eventually to decreased or absent sexual activity in both the male and the female—although the loss is slow to develop in the males of some species. Injections of gonadal hormones in castrated animals revive sexual activity. Testosterone in the male and estrogen in the female have the most marked effect. Large doses of testosterone and other androgens in castrated females initiate female behavior, and large doses of estrogens in castrated males trigger male mating responses. It is unsettled why responses appropriate to the sex of the animal occur when the hormones of the opposite sex are injected.

In women, ovariectomy does not necessarily reduce libido (defined in this context as sexual interest and drive) or sexual ability. Postmenopausal women continue to have sexual relations, often without much change in frequency from their premenopausal pattern. However, adrenal androgens are still present in these women (see Chapter 26). Testosterone, for example, increases libido in males, and so does estrogen used to treat diseases such as carcinoma of the prostate. The behavioral pattern that was present before treatment is stimulated but not redirected. Thus, administration of testosterone to homosexuals intensifies their homosexual drive but does not convert it to a heterosexual drive.

Estrogens:

There is 3 types:

1- Erstadiole which is the most potent.
2- Then comes; Estrone.
3- Estriol.

The doctor read the following slide:

Table 36.1 effect of estrogens.

Estrogen is called the bless hormone.

For bone = It works against osteoporosis

Endocrine = increases progesterone responses.

Liver = clotting enzymes, steroid binding proteins, increases HDL and decreases LDL; therefore, Cholesterol level in the female is lower than male.

Reproductive organs = increases uterine growth, vaginal and uterine tubes growth, increases breast growth, mucus secretions, increase LH receptors on granulosa cells.

The doctor read the following slide:

Function of Progestins table 36.2

On breast = increase lobular development and increase milk production.

Reproductive organs = increase endometrial growth and secretions, increase the mucosal secretions and thickening.

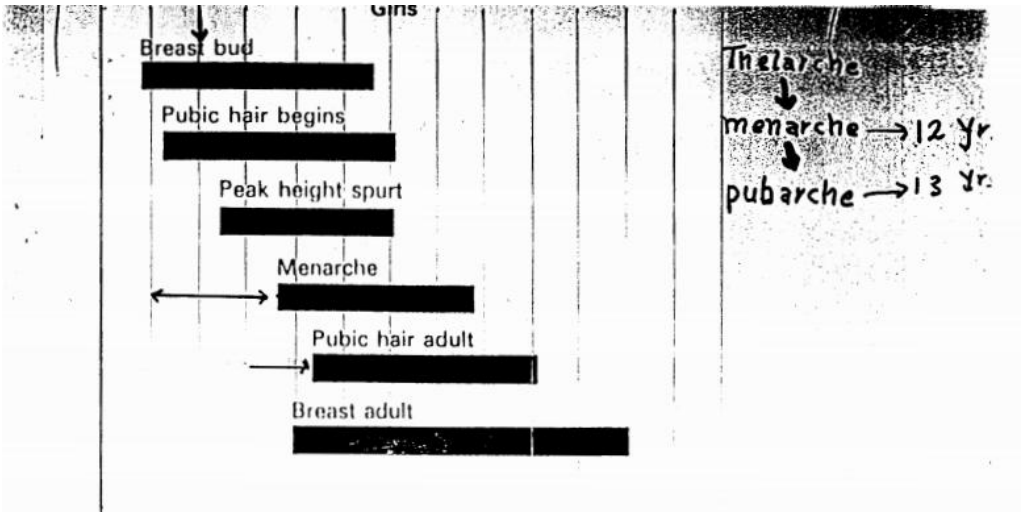
Increases the body temperature o.5 to 1 degrees, so as a way of avoiding pregnancy, a woman can measure her temperature everyday in the morning, and when she detect the increase in temperature she recognizes that she ovulated the

night before, thus she avoids sexual intercourse in this period to avoid pregnancy. However this is not a reliable method.

Puberty: at age of 13 years.

Before puberty, there are two symptoms: (Prepubertal stages)

1- Thelarche : the first time of puberty, appearance of breast buds at age of 10 years.
2- Menarche : at age of 12 years, it's the beginning of menstruation but it is irregular.
   Then the beginning of puberty occurs.



In males thelarche is charactrized by increase in the size of testicles, beginning of spermatogenesis, growth of pubic hair, and its timing is before puberty in males but later than puberty of females.

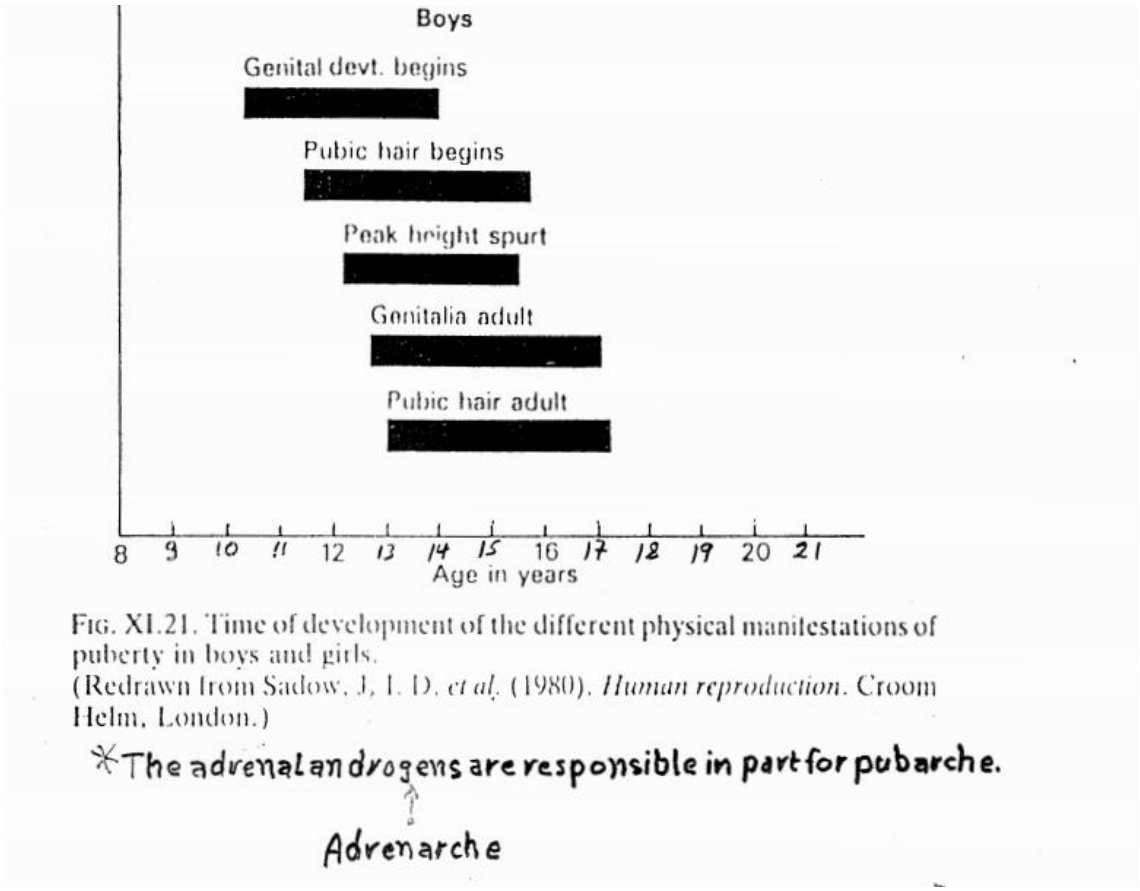


FIG. XI.21. Time of development of the different physical manifestations of puberty in boys and girls.
(Redrawn from Sadow, J. L. D. *et al.* (1980). *Human reproduction*. Croom Helm, London.)

*The adrenal androgens are responsible in part for pubarche.

Adrenarche

The doctor read the following:

Puberty in female:

- The female is more sensitive to factors that determines the time of puberty comparing to male because of estrogens, which are: genetics, nutrition, climate, geographical areas.
- From 150 years ago, the onset of puberty declined by 2-3 months every decade, and this correlates with improvement of nutrition and general health in America.
- In America because most research is done there.

- Leptin also plays a role in the beginning of puberty, it has permissive effect on initiation of puberty, it provides signals to the CNS telling that there is sufficient energy stores to support puberty.
- Lower altitudes, like females living in the dead sea, have puberty earlier; because of the lower altitudes as well as the nutrition quality.
- Obesity not overweight, and heavy exercise delay puberty.
- Pubertal growth need concreted action of sex steroids, growth hormones, insulin like growth factor.

The end.