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Topic : Female reproductive cycle in Vertebrates

Female reproductive cycle

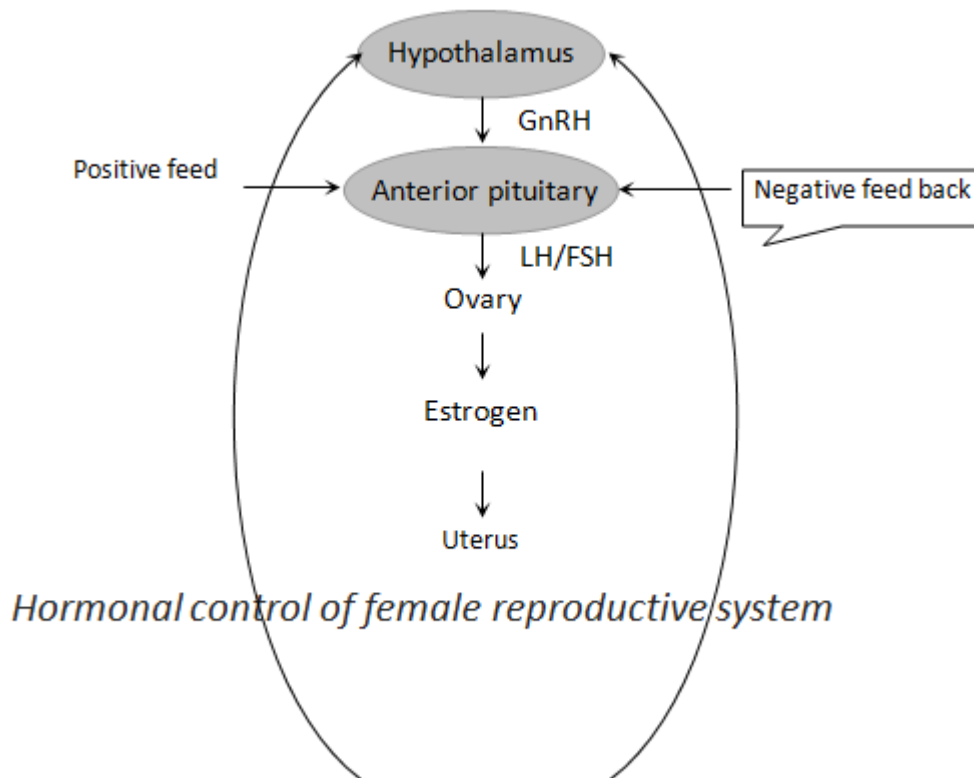
The general term female reproductive cycle encompasses the ovarian and uterine cycles, the hormonal changes that regulate them and the related cyclical changes in the ovary and cervix.

Ovarian cycle:

The ovarian cycle is a series of events in the ovaries that occur during and after the maturation of oocytes. It consists of following phases:

Follicular phase (pre-ovulatory phase): An ovary is made up of an outer cortex and an inner medulla. There are many follicles in the cortex, and each one contains an immature egg, called an oocytes. As the follicle undergoes maturation, it develops from a primary oocyte divides producing secondary oocytes.

Ovulatory phase: The vesicular follicle bursts, releasing the secondary oocytes (called an egg) surrounded by a clear membrane. This is referred to as ovulation. One ovarian follicle per month produces a secondary oocytes.



Hormonal control of female reproductive system

Fig: Hormonal control of female reproductive system

Luteal phase (post – ovulatory phase): once a follicle has lost its egg , it develops into a corpus luteum, a gland like structure. If pregnancy does not occur, the corpus luteum begins to degenerate after about 10 days.

Hormonal control of ovarian cycle: - These events, called the ovarian cycle, are under the control of the gonadotropic hormones, FSH and LH. The gonadotropic hormones are not present in constant amounts but instead are secreted at different rates during the cycle.

During the first half, or follicular phase, of the ovarian cycle, FSH promotes the development of a follicle in the ovary, which secretes estrogen and some progesterone. As the estrogen level in the blood rises, it exerts feedback control over the anterior pituitary secretion of FSH so that the follicular phase comes to

an end. Presumably, the high level of estrogen in the blood also causes a sudden secretion of a large amount of GnRH from the hypothalamus. This leads to a surge of LH production by the anterior pituitary and to ovulation at about the 14th day of a 28 –day cycle.

Uterine cycle: The uterine (menstrual) cycle is the cyclic changes related to ovulation and the secretion of ovarian hormones in the reproductive tract of anthropoid primates (monkeys, apes and humans). Menarche is the starting of menstruation in girls at about 13years. Menstrual cycle (average duration of 28 days) consists of three phase namely:

- Menstrual phase
- Proliferative phase
- Secretory phase

Menstrual phase: The human menstrual cycle is counted from the day on which menstrual bleeding begins. It lasts 3-5 days during which the superficial two -third portion of the endometrium called stratum functionale supplied with long coiled spiral arteries is shed. The average amount of blood (75% arterial) lost is about 30 ml.

Proliferative phase: Proliferative phase (also known as pre- ovulatory or follicular phase) from 5 to day 14 consists of growth of endometrium of uterus, Fallopian tubes and vagina. In ovary, a Graafian follicle grows, matures and secretes estrogen, the hormone active during this phase. The ovum is ejected from the follicle near the end of proliferative phase, i.e., 14th day or midway during menstrual cycle. Ovulation occurs under the influence of LH from anterior pituitary.

Secretory phase: After ovulation the corpus luteum is formed. Subsequent 14 days in which corpus luteum is active is referred to as secretory phase. Progesterone secreted by corpus luteum is active during secretory phase. The uterine endometrium and glands grow further during this phase. If the ovum shed at ovulation is not fertilized, at the end of secretory phase, corpus luteum

degenerates in the ovary. The progesterone secretion fails, the overgrown uterine endometrium breaks down and menstruation takes place.

Menopause: The menopause is the period of life when menstruation naturally stops in women. It usually occurs between ages of 45 and 50. The ovaries become smaller, the Graafian follicles disappear and replaced by fibrous tissue; ova, corpora lutea, and internal secretions of the ovary are no longer formed. The uterus and vagina gradually become atrophic. Ability to reproduce is lost in the female after menopause.

The function of the testes in male declines slowly with advancing age. There is no “male menopause” similar to that occurring in women.

Estrous cycle: Mammals other than primates do not menstruate and their sexual cycle is called estrous cycle. This cycle runs only during the breeding season. The estrogen level in blood increases at the time of ovulation resulting in a strong sex urge in the female called “period of heat”

Those animals that have only a single estrous during the breeding season are called monoestrous. e.g., bear, fox, wolf, bat etc. The animals that have a recurrence of estrous during breeding season are called polyestrous. e.g., mouse, squirrel, cow, sheep etc.

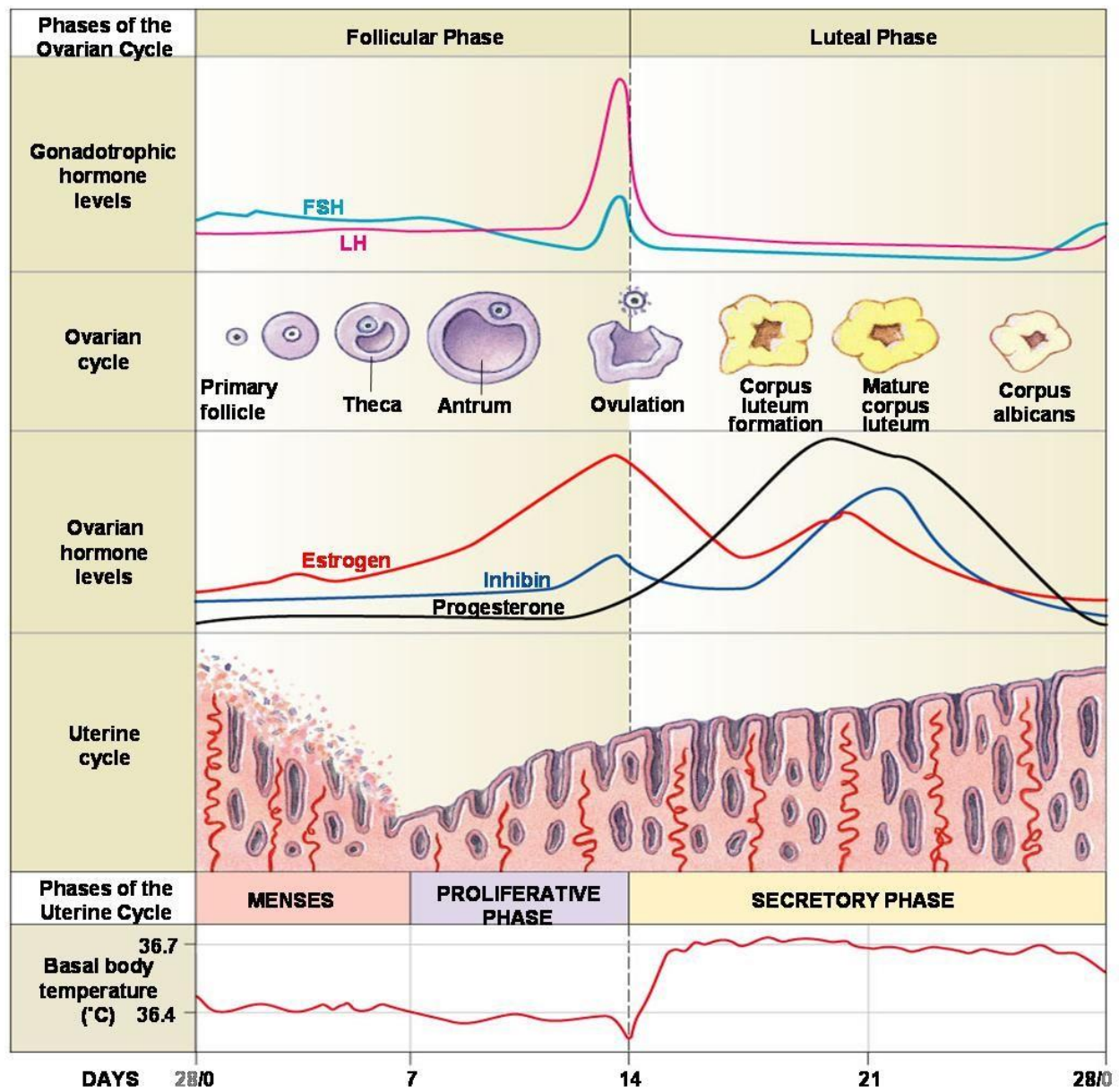


Fig. Phases of the ovarian cycle