

UNIT-2

Physiology of Menstrual cycle and Human sexuality

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Introduction

- Menstruation is shedding of endometrium due to withdrawal of progesterone.
- Menstruation is also called menses or periods. Menstruation occurs at the age between **13 to 15 years, when puberty starts.**
- Commencement of the menstrual cycle is called **menarche.**
- Menstrual cycle is stopped at the age between 45 to 50 years, this is called **menopause.** Duration of menstrual cycle is usually 28. But it may vary from woman to woman due to their living physiological conditions.

Menstrual cycles:

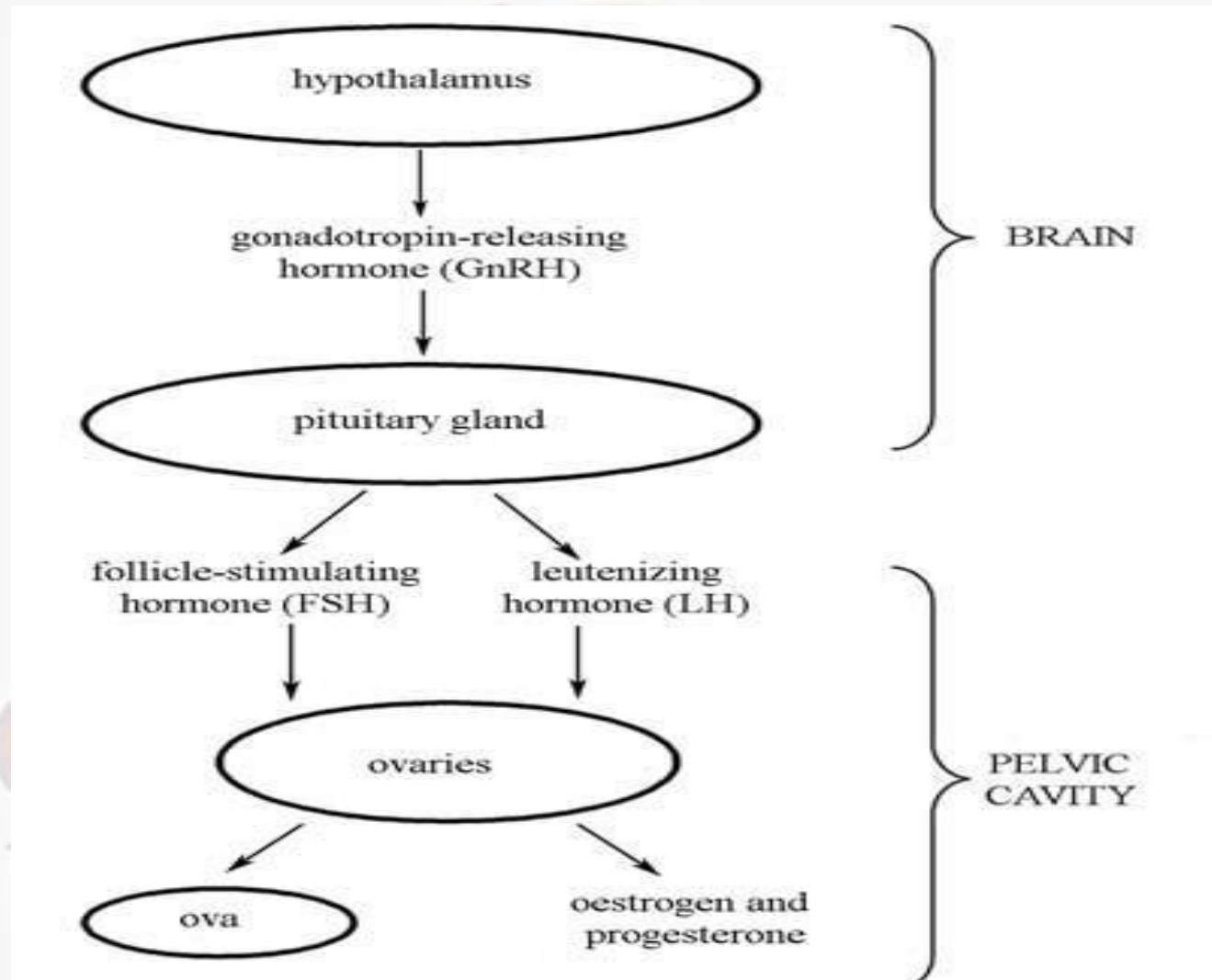
- Menstrual cycle has mainly two cycles
- 1. Ovarian cycle
- 2. Uterine cycle.

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- **OVARIAN CYCLE:** Ovarian cycle contains three phases
- 1. Follicular Phase
- 2. Ovulatory phase
- 3. Luteal Phase

1. Follicular Phase: Follicular phase starts from the 5th day of menstrual cycle to the 13th day of menstruation. In this phase maturation of follicles and ova take place.

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- Hypothalamus releases the Gonadotropin Releasing Hormone (GnRH), which stimulates the anterior pituitary gland to release Follicular Stimulating Hormone (FSH) and Luteinizing Hormone (LH).
- 2. FSH is essential for the development of ovarian follicles, these follicles produce more amount of oestrogen, when this oestrogen reaches to the peak level, FSH production is inhibited and no further development of ovarian follicles occur till the next cycle starts.
- 3. When Oestrogen levels are increased to a great extent, a large quantity of leutenising hormone (LH) will be secreted, there by the burst of highly dominant fraafian follicle occurs, and releases the ovum.

2. Ovulatory phase:

- Ovulation is the process by which the matured, dominant Graafian follicle ruptures with subsequent discharge of ovum into the abdominal cavity, which is called as an ovulation. Which usually takes place on 14th day of menstrual cycle in a normal cycle of 28 days.
- The ovum is sucked by the fimbrial end of the fallopian tube. The life span of the ovum is 24 to 48 hours.
- If there is fertilization, the fertilized ovum moves towards fallopian tube and reaches the uterine cavity by 3rd day of fertilization and implantation occurs on 7th day of fertilization.
- If there is no fertilization, degeneration of ovum occurs.
- Usually one is released from one of the ovaries each month.

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- A large amount of luteinizing hormone is released during this phase, which ruptures the graffian follicle and helps in releasing the ovum.

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3. Luteal phase:

- 1. Luteal phase extends between 15 and 28 day of menstrual cycle. During this phase, corpus luteum is developed, therefore it is called luteal phase.
- 2. After ovulation, remaining part is called corpus luteum. It secretes a large amount of progesterone and small amount of oestrogen.
- 3. If pregnancy occurs, corpus luteum remains active for three months to maintain the pregnancy till placenta takes over it's function, then after placenta starts secreting progesterone and oestrogen .

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- If there is no pregnancy, corpus luteum is degenerated called corpus albicans.
- 5. When the secretion of progesterone reaches to a peak level, LH inhibition occurs. Due to the low production of luteinizing hormone, production progesterone also reduced. The progesterone withdrawal causes the ischemic changes in the endometrium and shedding of endometrium occurs, which leads to bleeding during menstruation.

II. UTERINE CYCLE:

- **Uterine cycle contains four phases.**
- 1. Menstrual phase
- 2. Proliferative phase
- 3. Secretory phase
- 4. Ischemic phase

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Menstrual phase:

- Menstruation occurs due to the withdrawal of progesterone and shedding of endometrium. The desquamated endometrium is expelled out through vagina along with blood and tissue fluid. This process of shedding and exit of uterine bleeding and fluid is called menstruation.
- It usually lasts for 4 to 5 days. This period is called menstrual period. It is also called menses, emmenia or catamania

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During menstruation, about 35 ml of blood is expelled. The menstruation stops between 3rd and 7th day of menstrual cycle. At the end of the menstruation, the thickness of endometrium becomes 1mm. This is followed by proliferative phase.

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Proliferative phase:

- Proliferative phase extends usually from 5th to 14th day of menstruation.
- It corresponds to the follicular phase of ovarian cycle. In which endometrial cells proliferate rapidly and blood vessel appear in the stroma.
- Proliferation of endometrial cells occurs continuously so that endometrium reaches the thickness of 2 to 4 mm at the end of proliferative phase
- All these uterine changes during proliferative phase occur because of influence of oestrogen released from ovary and on 14th day ovulation occurs under the influence of LH this is followed by secretory phase.

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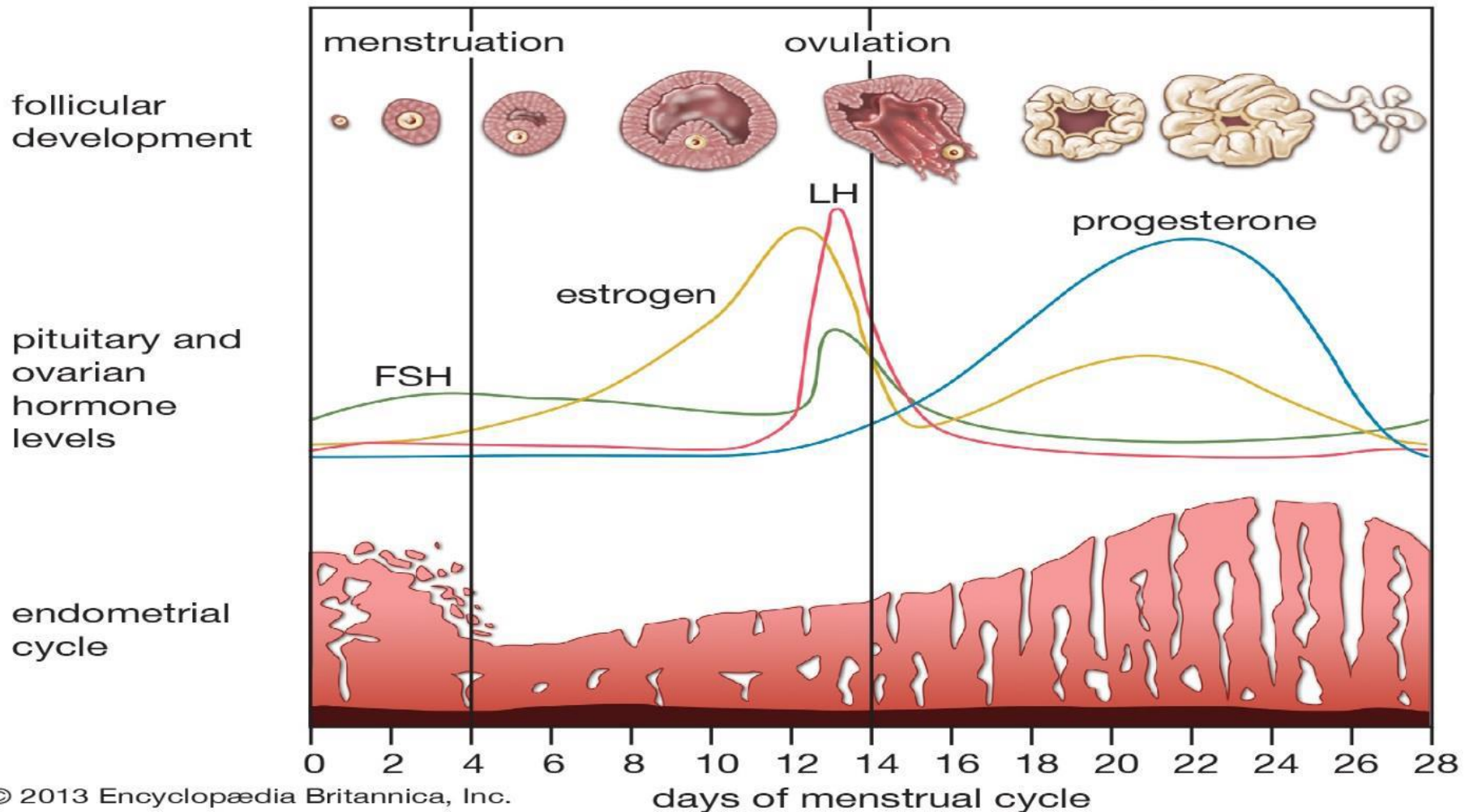
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The menstrual cycle

follicular phase

luteal phase



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3. Secretory phase

- Secretory phase extends between 15 and 28 day of menstrual cycle i.e. between the day of ovulation and the day when menstruation of next cycle commences.
- After ovulation corpus luteum is developed in the ovary. It secretes a large quantity of progesterone along with a small amount of oestrogen. Oestrogen causes for the proliferation of cells in uterus so that the endometrium becomes more thick.
- Progesterone causes for the enlargement of endometrial stromal and further growth of glands.
- Under the influence of progesterone the endometrial glands commences the secretory function.

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- Many changes occur in the endometrium before commencing the secretory function. Many new blood cells appear within endometrial stroma.
- Blood supply to endometrium increases. Thickness of endometrium 6 mm . Actually secretory phase is the preparatory period during which, the uterus is prepared for implantation of ovum.
- During secretory phase due to the influence of oestrogen and progesterone, damaged endometrium repaired
- Progesterone is responsible for further growth of these structures and secretory activities in the endometrium.

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Cervical changes during menstrual cycle

- During proliferative phase the mucous membrane of cervix becomes thinner and more alkaline due to the influence of oestrogen.
- It helps in the survival of motility of spermatozoa. In secretory phase mucous membrane of cervix becomes most thick and adhesive because of actions of progesterone.

Changes in vagina during menstrual cycle:

- During proliferative phase epithelial cells of vagina are cornified and oestrogen is responsible for this.
- During secretory phase vaginal epithelium due to the action of progesterone, which increases the resistance of vagina for infection.

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