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QUESTION

Briefly discuss the CYCLIC CHANGES in any two of the following:

a) CERVIX (b) VAGINA (c) BREASTS

Explicate any one of the following:

1) Menstrual cycle

2) Hormonal regulation of the menstrual cycle

CYCLIC CHANGES IN THE VAGINA

The vagina is strongly influenced by hormonal changes throughout the body. During the reproductive years after menarche (the first menstrual period) and before menopause, more layers of tissue are present lining the vagina, due to stimulation from higher estrogen levels in the body.

- The vagina changes in response to hormonal fluctuations of the menstrual cycle. Around mid-cycle, when estrogen is highest, vaginal tissue becomes thicker and fuller.
- The cervix, at the top of the vagina, moves and changes shape throughout the cycle.
- Before and after the fertile window, the cervix is low and can be felt in the vagina, with a firm texture, and the hole in the center of the cervix is closed.
- During the fertile window, the hole in the cervix opens to facilitate the entrance of sperm into the uterus, the cervix rises higher in the vagina, and is softer when touched.

CYCLIC CHANGES IN THE BREAST

Hormones affect many aspects of our breasts and it is a cause in its development in the first place. There are five main phases the breast will go through over the course of a monthly cycle.

- Phase 1: The first few days of your cycle (when your period starts), the texture of your boobs may suddenly feel uneven and nodular. Making the breasts feel lumpier as milk glands enlarge in preparation for a possible pregnancy.
- Phase 2: Toward the end of menstruation ,the Breasts are at their lowest volume at this time because estrogen and progesterone are at their lowest, They also tend to soften up

- Phase 3: As you get closer to ovulation (this is known as the follicular phase), estrogen starts to rise. This causes your breasts to look extra buoyant. That's because estrogen improves skin elasticity.
- Phase 4: In what's considered the luteal phase, Progesterone is really peaking, so this is a time associated with the largest breast size and density. They may even look swollen or slightly veiny, and feel tender.
- Phase 5: estrogen is low during your premenstrual week, breasts become less symmetrical. That could be why the left breast may look crooked all of a sudden, your boobs will even out when the menstrual cycle starts up again.

HORMONAL REGULATION OF THE MENUSTRAL CYCLE

Each month during the years between puberty and menopause, a woman's body goes through a number of changes to get it ready for a possible pregnancy. This series of hormone-driven events is called the menstrual cycle. During each menstrual cycle, an egg develops and is released from the ovaries. The lining of the uterus builds up. If a pregnancy doesn't happen, the uterine lining sheds during a menstrual period. Then the cycle starts again.

A woman's menstrual cycle is divided into four phases: menstrual phase, follicular phase, ovulation phase and luteal phase. The menstrual phase is the first stage of the menstrual cycle. It's also when you get your period. This phase starts when an egg from the previous cycle isn't fertilized. Because pregnancy hasn't taken place, levels of the hormones estrogen and progesterone drop. The thickened lining of your uterus, which would support a pregnancy, is no longer needed, so it sheds through your vagina. During your period, you release a combination of

blood, mucus, and tissue from your uterus. Period symptoms like these may occur: cramps, tender breasts, bloating, mood swings, irritability, headaches, tiredness, low back pain.

The follicular phase starts on the first day of your period (so there is some overlap with the menstrual phase) and ends when you ovulate. It starts when the hypothalamus sends a signal to your pituitary gland to release follicle-stimulating hormone (FSH). This hormone stimulates your ovaries to produce around 5 to 20 small sacs called follicles. Each follicle contains an immature egg. Only the healthiest egg will eventually mature. (On rare occasions, a woman may have two eggs mature.) The rest of the follicles will be reabsorbed into your body. The maturing follicle sets off a surge in estrogen that thickens the lining of your uterus. This creates a nutrient-rich environment for an embryo to grow. The average follicular phase lasts for about 16 days. It can range from 11 to 27 days, depending on your cycle.

The process of ovulation starts when there's a rise in estrogen levels during the follicular phase trigger your pituitary gland to release luteinizing hormone(LH).Ovulation is when your ovary releases a mature egg. The egg travels down the fallopian tube toward the uterus to be fertilized by sperm. The ovulation phase is the only time during your menstrual cycle when you can get pregnant. Ovulating by symptoms like these: a slight rise in basal body temperature, thicker discharge that has the texture of egg whites

Ovulation happens at around day 14 if you have a 28-day cycle — right in the middle of your menstrual cycle. It lasts about 24 hours. After a day, the egg will die or dissolve if it isn't fertilized.

After the follicle releases its egg, it changes into the corpus lutein. This structure releases hormones, mainly progesterone and some estrogen.

The rise in hormones keeps your uterine lining thick and ready for a fertilized egg to implant.

If pregnancy occurs, the body will produce human chorionic gonadotropin (HCG.). This is the hormone pregnancy tests detect. It helps maintain the corpus lutein and keeps the uterine lining thick. If you don't get pregnant, the corpus luteum will shrink away and be resorbed. This leads to decreased levels of estrogen and progesterone, which causes the onset of your period. The uterine lining will shed during your period. During this phase, if you don't get pregnant, you may experience symptoms of premenstrual syndrome (PMS). These include: bloating, breast swelling, pain, or tenderness, mood changes, headache, weight gain, changes in sexual desire, food cravings, trouble sleeping. The luteal phase lasts for 11 to 17 days. The average length is 14 days.

Now focusing more on the hormone regulation of the menstrual cycle;

The ovarian hormones circulate in the blood and are excreted in modified forms in the urine. Estimation of the urinary output by chemical methods gives an indication of the blood levels and of the total production of these substances. There are several natural estrogens, and numerous synthetic modifications of these and of progesterone have been devised; many are active when taken by mouth and are used for treatment of hormonal disorders and as oral contraceptives.

The cyclic events in the ovary that have already been mentioned depend on gonadotropic hormones secreted by the anterior lobe of the pituitary gland; this gland is situated in a small recess at the base of the skull. There are two, and possibly three, gonadotropic hormones: follicle-stimulating hormone (FSH), luteinizing hormone (LH), and, possibly, luteotropic hormone (LTH).

FSH is secreted in greatest amount in the first half of the menstrual cycle, and LH has its peak of secretion at mid-cycle. It is believed that the sequential action of FSH and LH causes ripening of the follicle and ovulation. LTH in women under treatment for infertility ovulation has been successfully induced with FSH and LH alone. Multiple births, as the result of multiple ovulation, have occurred after excessive doses of FSH have been given.

The pituitary gland stimulates the ovary to produce estrogens and progesterone, but there is a “negative feedback” by which the estrogens inhibit the output of FSH from the pituitary gland (and probably stimulate the output of LH). In addition, progesterone is believed to inhibit the further output of LH. In this process, in which the pituitary first stimulates the ovary, and the ovary then inhibits the pituitary, the basic rhythm is under the control of the hypothalamus; nevertheless, ovulation can be inhibited by oral contraceptives, which contain estrogens and progestogens—modifications of progesterone.

The anterior lobe of the pituitary gland is connected by its stalk to the hypothalamic region of the brain. The anterior lobe secretes many important hormones, including those that control the activity of the adrenal and thyroid glands, the growth hormone, and the gonadotropic hormones. From the hypothalamus substances are carried in the veins in the pituitary stalk that cause release of hormones from the pituitary, including FSH and LH, but also a factor that inhibits release of LTH. The higher brain centres no doubt affect the hypothalamic function; this explains the temporary disturbances of menstruation that may follow emotional stress.

Ovulation occurs at about the midpoint of each normal cycle, and the ovum is probably capable of fertilization for only about two days after this. In the majority of women the time of ovulation is fairly constant. In women with cycles of irregular length the date of ovulation is uncertain; in these women the long menstrual cycles are usually due to prolongation of the proliferative phase; the secretory phase tends to remain normal in length. In some animals, ovulation only follows coitus; this mechanism has been used to explain cases in which human pregnancy has apparently followed coitus early or late in the menstrual cycle, but there is no definite evidence for such a mechanism in women.

Each menstrual period lasts for about five days, but the duration and amount of the flow vary considerably even in perfect health.In some women there may be premonitory symptoms such as pelvic discomfort, soreness of the breasts (because of the response of these organs to estrogens), and emotional tension. Ovarian hormones cause retention of sodium and water in the tissue fluids; premenstrual tension, sometimes called premenstrual syndrome, may be partly due to this and in some cases can be relieved by diuretics, drugs that increase the production of urine. When the menstrual flow starts, the uterus contracts to expel the blood and disintegrating endometrium. These contractions may be painful, especially in young women who have never been pregnant. Menstrual discomforts such as those that have been mentioned vary greatly in degree from woman to woman and from time to time but ordinarily do not interfere with normal activities.

Refrences; https://en.wikipedia.org/wiki/Menstrual_cycle