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COURSE TITLE: HUMAN PHYSIOLOGY II

ASSIGNMENT QUESTION:

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

a) CERVIX (b) VAGINA (c) BREASTS

2. Explicate any one of the following:

1) Menstrual cycle

2) Hormonal regulation of the menstrual cycle

ANSWERS:

1. (a.) CYCLIC CHANGES IN THE CERVIX

The cervix is the lowest part of the uterus. It is the passageway connecting the vagina to the uterine cavity. The position and texture of the cervix changes during every woman's cycle.

During menstrual phase, the cervix is usually low and hard and slightly open to allow the blood to flow out.

After menstrual flow stops, the cervix remains low and hard and the opening to the uterus remains closed. But as a woman begins to approach ovulation, the cervix rises up to the top of the vagina and becomes softer and moister.

At the apex of ovulation, a woman is most fertile and the uterus is open to permit the passage of sperm. Sometimes the cervix seems to disappear, which just means it has become so soft that it blends in with the vaginal walls and rises so high that the finger cannot touch it. This is known as SHOW: soft, high, open, and wet. This is the optimal time to have sex to achieve pregnancy. If pregnancy occurs the cervix will rise up and become soft, yet the uterus will remain tightly closed. This occurs at different times for different women and could be as early as 12 days after ovulation or well after the pregnancy has been confirmed by a home pregnancy test or doctor.

However when ovulation occurs, the cervix drops lower and becomes more firm. The opening to the uterus will become tightly closed. This can happen immediately after ovulation or may take several hours to several days.

(b.) CYCLIC CHANGES OF THE BREAST

Monthly, women experience ups and downs in the hormones that make up the normal menstrual cycle. The hormone, estrogen is produced by the ovaries in the first half of the menstrual cycle and stimulates the growth

of milk ducts in the breasts. The increase in the level of estrogen leads to ovulation halfway through the cycle.

Afterwards, the hormone progesterone takes over in the second half of the cycle and stimulates the formation of the milk glands. These hormones are believed to be responsible for the cyclical changes such as swelling, pain and soreness that many women experience in their breasts just before menstruation.

During menstruation, many women also have changes in breast texture. Their breasts may feel very lumpy. This is because the glands in the breast are enlarging to get ready for a possible pregnancy. If pregnancy does not happen, the breasts go back to normal size. Once menstruation starts, the cycle begins again.

2. (1.) THE MENSTRUAL CYCLE

Menstruation, periodic discharge from the vagina of blood, secretions, and disintegrating mucous membrane that had lined the uterus

During the menstrual cycle, the uterus undergoes a series of histologically recognisable cyclic changes under the influence of changing circulating hormonal levels.

Phases of the menstrual cycle

Although, the typical human menstrual cycle is 28 days, the cycle may differ from woman to woman hence, cycles which may be as short as 21 days or as

long as 35 days are not abnormal. It is normal to call the first day of the menstrual period the first day of the cycle, although menstruation is the end rather than the beginning of a process. On this basis, the cycle is described as starting with about five-seven days of menstruation, followed by a proliferative phase that lasts to about the 14th day, and then a secretory phase that lasts until the next menstruation.

The external manifestation of menstruation depends upon cyclical change in the lining of the body of the uterus. The lining, called endometrium, consists of tubular glands that open into the uterine cavity. The glands lie in a vascular framework, or stroma and are separated by it.

At the end of menstruation, just at the beginning of the proliferative phase, the endometrium is thin, with short, straight glands, and the ovary is quiescent.

Under the influence of the gonadotropic hormones from the pituitary gland an ovarian follicle (occasionally more than one) ripens in one of the ovaries. This ovarian follicle contains the ovum, which is a cell about 0.14 millimetre (0.006 inch) in diameter, surrounded by a group of smaller cells, called granulosa cells. The granulosa cells multiply, with the ovum situated in the wall of the rounded structure that they form, and secrete an estrogenic hormone, estradiol (see hormone). This hormone causes proliferative changes in the endometrium, so that the glands become taller and the whole endometrium becomes thicker and more vascular.

At about mid-cycle ovulation occurs: The ovum is discharged out of the follicle and from the surface of the ovary, to be received into the fallopian tube, down which it is carried to the uterus. After ovulation the granulosa cells lining the follicle from which the ovum has been extruded accumulate yellow lipid and are therefore called lutein cells, from the Latin word luteus, "saffron-yellow." The altered follicle is called corpus luteum. The corpus luteum continues to secrete estrogens but now also secretes progesterone; this additional hormone induces the secretory phase in the endometrium. The endometrial glands are distended with secretion and become very tortuous, while the stromal cells are swollen. The appearance of the endometrium at the end of the menstrual cycle is indistinguishable from that of early pregnancy, and this endometrial change is a preparation for the reception of the ovum. If it is fertilized, the ovum liberated at mid-cycle reaches the uterine cavity at a time when the endometrium is in the secretory phase, and the ovum embeds itself in the endometrium and starts its growth. If the ovum is not fertilized the endometrium breaks down and menstruation occurs. Menstruation has therefore been described as the outward evidence of the abortive close of one cycle and the hopeful commencement of the next.

When the ovum dies, the corpus luteum degenerates and ceases to produce hormones. On the withdrawal of estrogens and progesterone there is sudden spasm of the endometrial blood vessels, and all but the basal layer of the

endometrium dies. The disintegrating endometrium is shed, together with some blood. The endometrium contains plasmin, an enzyme that dissolves blood clots, so that the menstrual discharge is normally fluid. The total blood loss does not ordinarily exceed 50 millilitres.

When menstruation is over, the endometrium regenerates from the residual basal layer during the proliferative phase of the next cycle.