Name: Ebikeseiye Gesiere Beulah

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Assignment 2 (Female Reproductive physiology)

Question 1: Briefly discuss the cyclic changes in any two of the following: (a) Cervix (b) Vagina (c) Breasts

Cervix :

Cervical mucus appears to have an important function in the process of human reproduction. In response to stimulation by estrogen, cervical glands produce increasing amount of a characteristic mucoid secretion. At the peak of this secretory activity, prior to ovulation, these glands produce a copious amount of a thin, isotonic mucus which is easily penetrated by the sperm. Progesterone on the other hand, is known to bring about both quantitative and qualitative alteration in the cervical secretion.

Cervical mucus at midcycle is increased in amount, acellularity, water content, and fluidity. Furthermore, cervical mucus at this time is well supplied with carbohydrate and presumably amino acids. From a teleologic standpoint, we may conclude that because of these characteristics the sperm, on deposition in the vagina, find an environment propitious for their nutrition and migration through the cervical canal.

During the luteal phase of the menstrual cycle, cervical mucus has shown to become scanty in amount, as well as viscous and cellular. During the progestational phase also, such properties as spinnbarkeit and crystallization of the cervical mucus, which characterize estrogen stimulation, are markedly reduced or absent and consequently sperm migration is inhibited.

Since endogenous progesterone causes an inhibition of sperm migration through cervical mucus, exogenously administered progestins, as prescribed for oral contraception, might be expected to have a similar effect.

Breasts:

The volumes and spin-lattice (T1) relaxation times of breast tissues and parenchymal water content were measured non-invasively by magnetic resonance imaging (MRI) in eight healthy women during 4-8 consecutive menstrual cycles. Total breast volume, and parenchymal volume, T1 relaxation time and water content rose sharply by 38.9%, 15.1% and 24.5%, respectively, and peaked after day 25. Within 5 days of the onset of menses, parenchymal volume fell sharply by 30.3%, while water content declined by 17.5%. Rising parenchymal volume in the second half of the menstrual cycle is not solely due to increased tissue water content and provides in vivo evidence for both growth and increased tissue fluid at the same time.

Whether the breast tissue undergoes morphologic changes in relation to the menstrual cycle had been a subject of debate. Elegant studies performed in the early 1980s provided conclusive

evidence of cyclical changes in the normal breast lobules. These studies were almost entirely based on autopsy material and have not been validated in the clinical setting.

Patients taking oral contraceptives or hormonal therapy were excluded from this study. The following histological parameters were used to assess the menstrual stage: number of cell layers in the acini and presence and degree of vacuolation of the myoepithelial cells, stromal edema, infiltrate, mitosis, and apoptosis. The normal breast undergoes changes through the menstrual cycle that affects all aspects of breast morphology, protein expression, and cell kinetics. This physiologic cycling appears to be disturbed in women with breast cancer and may reflect a global dysregulation of response to hormonal influences. These findings lend greater impetus to studies of normal breast physiology and its possible aberrations in women who are at increased risk for cancer.

QUESTION 2: Explicate any of the following :

(1) Menstrual cycle

(2) Hormonal regulation of menstrual cycle

Menstrual cycle:

Menstruation is a normal process that females go through as their bodies prepare themselves for potential pregnancy. It is bleeding from the vagina that

happens about once a month as a normal part of the menstrual cycle. It is a part of the monthly menstrual cycle (regular cycling of hormones) that occur in the female reproductive system that makes pregnancy possible. Medically, menstruation (also termed period or bleeding) is the process in a woman of discharging (through the vagina) blood and other materials from the lining of the uterus at about one monthly interval from puberty until menopause (ceasing of regular menstrual cycles), except during pregnancy . This discharging process lasts about 3-5 days. Besides the bleeding, other signs and symptoms of menstruation may include headache, acne, bloating, pains in the lower abdomen, tiredness, mood changes, food cravings, breast soreness, and diarrhea. The menstrual cycle is the hormonal driven cycle; Day 1 is the first day of your period (bleeding) while day 14 is the appropriate day you ovulate and if an egg is not fertilized, hormone levels eventually drop and at about day 25, egg begins to dissolve and the cycle begins again with the period at about day 30. Menstruation begins day 1 and normally ends days 3-5 of the menstrual cycle. The range of age for a girl to get her first period is about 8-15 years. Women usually have periods until about ages 45 to 55. The menstrual cycle is the hormonal driven cycle. Day 1 is the first day of your period (bleeding) while day 14 is the approximate day you ovulate and if an egg is not fertilized, hormone levels eventually drop and at about day 30. Most periods vary somewhat, the flow be light, moderate or heavy and can vary in length from about 2-7 days; with age, the cycle usually shortens and becomes more regular.

Menstruation is bleeding from the vagina that happens about once a month, as a normal part of the menstrual cycle. The menstrual cycle is the regular natural change that occurs in the female reproductive system that makes pregnancy possible. The cycle is required for the production of oocytes, and for the preparation of the uterus for pregnancy. The menstrual cycle occurs due to the rise and fall of estrogen. During this cycle, your hormones make the lining of the uterus become thicker, getting ready in case of pregnancy. Hormones also cause an egg to be released from an ovary, which is known as ovulation.

The menstrual cycle is part of the female body's way of preparing for a possible pregnancy each month. Understanding how the process works is important, since you can use this information to help to either get pregnant or avoid getting pregnant, to better manage any menstrual symptoms you are experiencing, and understand when there might be a problem.

Menstruation is the technical term for getting your period. About once a month, females who have gone through puberty will experience menstrual bleeding. This happens because the lining of the uterus has prepared itself for a possible pregnancy by becoming thicker and thicker and richer in blood vessels. If pregnancy does not occur, this thickened lining is shed, accompanied by bleeding. Bleeding usually lasts for 3-8 days. For most women, menstruation happens in a fairly regular, predictable pattern. The length of time from the first day of one period to the first day of the next period normally ranges from 21-35 days.

The menstrual cycle is controlled by a complex orchestra of hormones, produced by two structures in the brain, the pituitary gland and the hypothalamus alomg with the ovaries. The menstrual cycle includes several phases of the cycle is a little bit different for every woman and can change over time.

CYCLE DAYS (APROXIMATE): EVENTS OF THE MENSTRUAL CYCLE

- Days 1-5: The first day of menstrual bleeding is considered Day 1 of the cycle. A female's period can last anywhere from 3-8 days, but 5 days is the average. Bleeding is usually heaviest on the first 2 days.
- Days 6-14: Once the bleeding stops (Days 6-18), the uterine lining (also called endometrium) begins to prepare for the possibility of a pregnancy. The uterine lining becomes thicker and enriched in blood and nutrients.
- Days 14-25: Somewhere around day 14, an egg is released from one of the ovaries and begins its journey down the fallopian tubes to the uterus. If sperm are present in the fallopian tube at this time, fertilization can occur. In this case the fertilized egg will travel to the utrus and attempt to implant in the uterine wall
- Days 25-28: If the egg was not fertilized or implantation does not occur, hormonal changes signal the uterus to prepare to shed its lining, and the egg breaks down and is shed along with lining. The cycle begins again on Day 1 menstrual bleeding.

The menstrual cycle has three phases:

1. Follicular Phase (Days 1-14)

2. Ovulatory phase (Day 14)
3. Luteal phase (Days 14-28)