

NAME: EDIGBE JOY ELOHOR
DEPARTMENT OF NURSING
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QUESTION 2

MENSTRUAL CYCLE

The menstrual cycle is the regular natural change that occurs in the female reproductive system (specifically the uterus and ovaries) 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. This cycle results in the thickening of the lining of the uterus, and the growth of an egg, (which is required for pregnancy).The egg is released from an ovary around day fourteen in the cycle; the thickened lining of the uterus provides nutrients to an embryo after implantation. If pregnancy does not occur, the lining is released in what is known as menstruation.

The menstrual cycle is governed by hormonal changes. These changes can be altered by using hormonal birth control to prevent pregnancy. Each cycle can be divided into three phases based on events in the ovary (ovarian cycle) or in the uterus (uterine cycle). The ovarian cycle consists of the follicular phase, ovulation, and luteal phase whereas the uterine cycle is divided into menstruation, proliferative phase, and secretory phase.

Stimulated by gradually increasing amounts of estrogen in the follicular phase, discharges of blood (menses) flow stop, and the lining of the uterus thickens. Follicles in the ovary begin developing under the influence of a complex interplay of hormones, and after several days one or occasionally two become dominant (non-dominant follicles shrink and die). Approximately mid-cycle, 24 – 36 hours after the luteinizing hormone (LH) surges, the dominant follicle releases an ovocyte, in an event called ovulation. After ovulation, the ovocyte only lives for 24 hours or less without fertilization while the remains of the dominant follicle in the ovary become a corpus luteum; this body has a primary function of producing large amounts of progesterone.

Under the influence of progesterone, the uterine lining changes to prepare for potential implantation of an embryo to establish a pregnancy. If implantation does not occur within approximately two weeks, the corpus luteum will involute, causing a sharp drop in levels of both progesterone and estrogen. The hormone drop causes the uterus to shed its lining in a process termed menstruation. Menstruation also occurs in closely related primates (apes and monkeys).

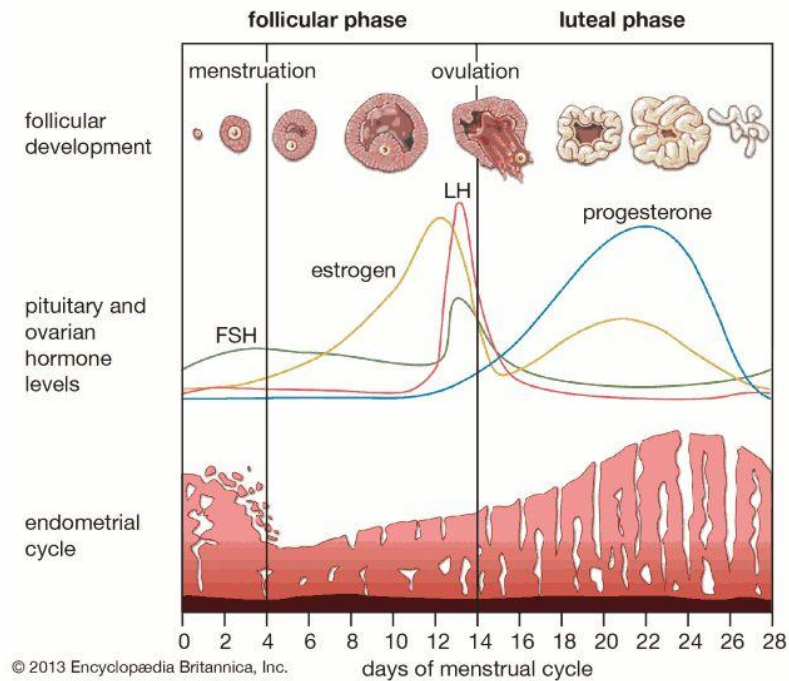
FREQUENCY OF THE MENSTRUAL CYCLE

The length of a woman's menstrual cycle typically varies somewhat, with some shorter cycles and some longer cycles. A woman who experiences variations of less than eight days between her longest cycles and shortest cycles is considered to have regular menstrual cycles. It is unusual for a woman to experience cycle length variations of more than four days. Length variation between eight and 20 days is considered as moderately irregular cycles. Variation of 21 days or more between a woman's shortest and longest cycle lengths is considered very irregular.

The average menstrual cycle lasts 28 days. The variability of menstrual cycle lengths are highest for women under 25 years of age and are lowest, that is, most regular, for ages 25 to 39. Subsequently, the variability increases slightly for women aged 40 to 44.

The luteal phase of the menstrual cycle is about the same length in most individuals (mean 14.13 days, standard deviation 1.41 days) whereas the follicular phase tends to show much more variability (log-normally distributed with 95% of individuals having follicular phases between 10.3 and 16.3 days). The follicular phase also seems to get significantly shorter with age (geometric mean 14.2 days in women aged 18 – 24 vs. 10.4 days in women aged 40 – 44).

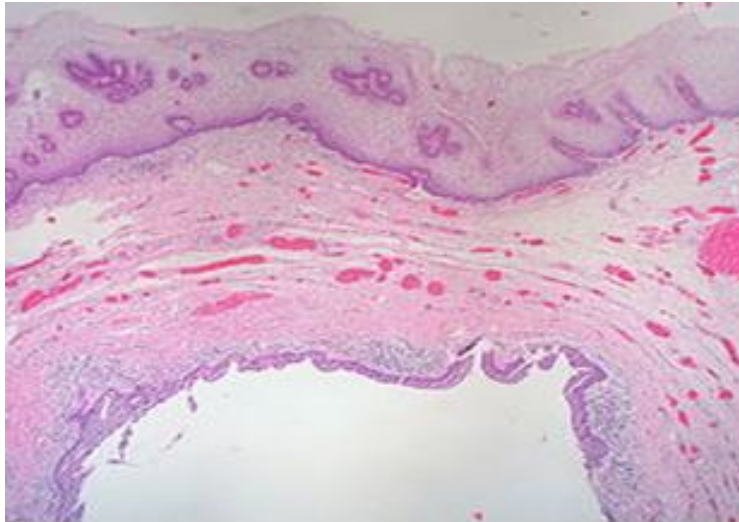
The menstrual cycle



QUESTION 1

CYCLIC CHANGE IN THE VAGINA

The vagina is a distensible, thin-walled tubular structure which extends from the cervix to the vulva. It is loosely attached to the rectum dorsally and to the urethra ventrally. It is dorsoventrally flattened with numerous longitudinal folds which increase in width posteriorly and continue to the periphery of the vaginal opening. The appearance of the vaginal mucosa varies, depending on the stage of the estrous cycle. It is dry, without luster, and opaque during proestrus and estrus, and moist and pinkish during metestrus and diestrus. The vulva is the external portion of the genitalia and surrounds the vaginal opening. It is composed of a rim of tissue that is less than 1 mm in width and is covered by sparse hairs. It may become slightly swollen during the estrous stage of the cycle.



THE EPITELLIUM OF THE VAGINA

In the course of the reproductive cycle, the vaginal epithelium is subject to normal, cyclic changes that are influenced by estrogen: with increasing circulating levels of hormones.

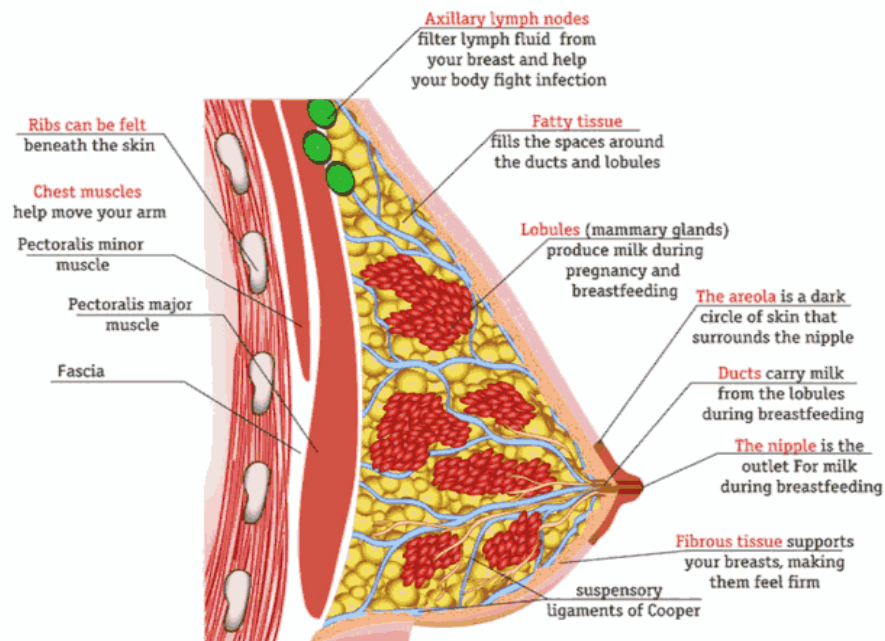
CYCLIC CHANGE IN THE BREAST

Breast development is a vital part of a woman's reproduction. Breast development happens in certain stages during a woman's life: first before birth, again at puberty, and later during the childbearing years. Changes also happen to the breasts during the menstrual cycle and when a woman reaches menopause. Each month, women go through changes 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. It stimulates the growth of milk ducts in the breasts. The increasing level of estrogen leads to ovulation halfway through the cycle. Next, the hormone progesterone takes over in the second half of the cycle. It stimulates the formation of the milk glands. These hormones are believed to be responsible for the cyclical changes that many women feel in their breasts just before menstruation. These include swelling, pain, and soreness. 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.

Breasts can go through changes during a menstrual cycle. They get tender, and even seem to shift a bit in size and shape.

Every woman is different. But it's common to have one or more of the following:

- Swelling
- Tenderness
- Aches
- Soreness
- Changes in texture



STRUCTURE OF THE BREAST