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BIOMEDICAL ENGINEERING

PHS 212 (HUMAN PHYSIOLOGY)

1. Briefly discuss the cyclic changes in
2. Vagina; Vaginal smear taken from lateral vaginal fornix shows different pictures according to the cycle.

* In the follicular phase the smear consists of many superficial cells with acidophilic cytoplasm and pyknotic nucleus. The background is clear with few leucocytes.
* In the luteal phase the smear consists mainly of intermediate cells with folded edges (navicular cells). These cells have basophilic cytoplasm and vesicular nucleus. The back ground is unclear with many leucocytes.

1. Breast; In the follicular phase under the effect of estrogen, proliferation of cells in breast membrane. In the luteal phase under the effect of progesterone, production of secretions in the breast substance.

The breast increases in size, tenderness, firmness and blood supply, ducts enlarge with the increase in the number of cells lining the ducts and the breast retains more fluids.

1. Explicate on the menstrual 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
* Luteal phase

The length of each phase can differ from woman to woman, and it can change over time.

Menstrual phase

The menstrual phase is the first stage of the menstrual cycle. It’s also when the woman gets her 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 the uterus, which would support a pregnancy, is no longer needed, so it sheds through the vagina. During a woman’s period, she releases a combination of blood, mucus, and tissue from the uterus.

There may be period symptoms like these:

* cramps
* tender breasts
* bloating
* mood swings
* irritability
* headaches
* tiredness
* low back pain

On average, women are in the menstrual phase of their cycle for 3 to 7 days. Some women have longer periods than others.

Follicular phase

The follicular phase starts on the first day of a woman’s period (so there is some overlap with the menstrual phase) and ends when she ovulates.

It starts when the hypothalamus sends a signal to the pituitary gland to release follicle-stimulating hormone (FSH). This hormone stimulates the 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 the woman’s cycle.

Ovulation phase

Rising estrogen levels during the follicular phase triggers the pituitary gland to release luteinizing hormone (LH). This is what starts the process of ovulation.

Ovulation is when the 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 the menstrual cycle when one can get pregnant. One can tell that one is 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 one has a 28-day cycle — right in the middle of the menstrual cycle. It lasts about 24 hours. After a day, the egg will die or dissolve if it isn’t fertilized.

Because sperm can live up to five days, pregnancy can occur if a woman has sex as much as five days prior to ovulation.

Luteal phase

After the follicle releases its egg, it changes into the corpus luteum. 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 the woman does get pregnant, the body will produce human chorionic gonadotropin (hCG). This is the hormone pregnancy tests detect. It helps maintain the corpus luteum and keeps the uterine lining thick.

If the woman does not 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 the period. The uterine lining will shed during the woman’s period.

During this phase, if the woman doesn’t get pregnant, she 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.