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**Department: Pharmacology**

**Course code: PHS 212**

**Assignment: Female reproductive physiology**

**A. Question: Briefly discuss the cyclic change in any two of the following:**

**1. Vagina**

The vagina is a muscular, hollow tube that extends from the vaginal opening to the cervix of the uterus. It is situated between the urinary bladder and the rectum. It is about three to five inches long in a grown woman. The muscular wall allows the vagina to expand and contract. The muscular walls are lined with mucous membranes, which keep it protected and moist. A thin sheet of tissue with one or more holes in it, called the hymen, partially covers the opening of the vagina. The vagina receives sperm during sexual intercourse from the penis. The sperm that survive the acidic condition of the vagina continue on through to the fallopian tubes where fertilization may occur. The vagina is made up of three layers, an inner mucosal layer, a middle muscularis layer, and an outer fibrous layer.

The inner layer is made of vaginal rugae that stretch and allow penetration to occur. These also help with stimulation of the penis. Microscopically the vaginal rugae has glands that secrete an acidic mucus (pH of around 4.0.) that keeps bacterial growth down. The outer muscular layer is especially important with delivery of a fetus and placenta.

**Purposes of the Vagina**

- Receives a males erect penis and semen during sexual intercourse.
- Pathway through a woman's body for the baby to take during childbirth.
- Provides the route for the menstrual blood (menses) from the uterus, to leave the body.

- May hold forms of birth control, such as a diaphragm, FemCap, Nuva Ring, or female condom

## 2. Cervix

The cervix (from Latin "neck") is the lower, narrow portion of the uterus where it joins with the top end of the vagina. Where they join together forms an almost 90 degree curve. It is cylindrical or conical in shape and protrudes through the upper anterior vaginal wall. Approximately half its length is visible with appropriate medical equipment; the remainder lies above the vagina beyond view. It is occasionally called "cervix uteri", or "neck of the uterus". During menstruation, the cervix stretches open slightly to allow the endometrium to be shed. This stretching is believed to be part of the cramping pain that many women experience. Evidence for this is given by the fact that some women's cramps subside or disappear after their first vaginal birth because the cervical opening has widened.

The portion projecting into the vagina is referred to as the portio vaginalis or ectocervix. On average, the ectocervix is three cm long and two and a half cm wide. It has a convex, elliptical surface and is divided into anterior and posterior lips. The ectocervix opening is called the external os. The size and shape of the external os and the ectocervix varies widely with age, hormonal state, and whether the woman has had a vaginal birth. In women who have not had a vaginal birth the external os appears as a small, circular opening. In women who have had a vaginal birth, the ectocervix appears bulkier and the external os appears wider, more slit-like and gaping.

The passageway between the external os and the uterine cavity is referred to as the endocervical canal. It varies widely in length and width, along with the cervix overall. Flattened anterior to posterior, the endocervical canal measures seven to eight mm at its widest in reproductive-aged women. The endocervical canal terminates at the.

### **B. Question: explicate any one of the following:**

#### **Menstrual cycle**

The menstrual cycle is complex and is controlled by many different glands and the

hormones that these glands produce. A brain structure called the hypothalamus causes the nearby pituitary gland to produce certain chemicals, which prompt the ovaries to produce the sex hormones oestrogen and progesterone.

The menstrual cycle is a biofeedback system, which means each structure and gland is affected by the activity of the others.

**The four main phases of the menstrual cycle are:**

- Menstruation
- The follicular phase
- Ovulation
- The luteal phase.

- **Menstruation**

Menstruation is the elimination of the thickened lining of the uterus (endometrium) from the body through the vagina. Menstrual fluid contains blood, cells from the lining of the uterus (endometrial cells) and mucus. The average length of a period is between three days and one week.

Sanitary pads or tampons are used to absorb the menstrual flow. Both pads and tampons need to be changed regularly (at least every four hours). Using tampons has been associated with an increased risk of a rare illness called toxic shock syndrome (TSS).

**When do girls start their period?**

Girls have their first period during puberty. Most often that is around the age 12 or 13 years old, but girls can start menstruating as young as 9, or as late as 16.

**Bleeding.** When you menstruate, your body sheds the lining of the uterus (womb). Menstrual blood flows from the uterus through the small opening in the cervix and passes out of the body through the vagina. Most menstrual periods last from 3 to 5 days.

## **How long do periods last?**

Menstruation affects every woman, but the experience can differ between women. When periods (menstruations) come regularly, this is called the menstrual cycle. Having regular menstrual cycles is a sign that important parts of your body are working normally. The menstrual cycle provides important body chemicals, called hormones, to keep you healthy. It also prepares your body for pregnancy each month. A cycle is counted from the first day of 1 period to the first day of the next period. The average menstrual cycle is 28 days long. Cycles can range anywhere from 21 to 35 days in adults and from 21 to 45 days in young teens. The rise and fall of levels of hormones during the month control the menstrual cycle.

## **What are the signs and symptoms of menstruation?**

Some women get symptoms leading up to and during menstruation, for example, cramps or pains low in the abdomen, bloating or swelling in the abdomen, constipation before your period, diarrhea when your period starts, acne, tiredness, and mood changes.

- **Follicular phase**

The follicular phase starts on the first day of menstruation and ends with ovulation. Prompted by the hypothalamus, the pituitary gland releases follicle stimulating hormone (FSH). This hormone stimulates the ovary to produce around five to 20 follicles (tiny nodules or cysts), which bead on the surface. Each follicle houses an immature egg. Usually, only one follicle will mature into an egg, while the others die. This can occur around day 10 of a 28-day cycle. The growth of the follicles stimulates the lining of the uterus to thicken in preparation for possible pregnancy.

- **Ovulation**

Ovulation is the release of a mature egg from the surface of the ovary. This usually occurs mid-cycle, around two weeks or so before menstruation starts.

During the follicular phase, the developing follicle causes a rise in the level of oestrogen. The hypothalamus in the brain recognizes these rising levels and releases a chemical called gonadotrophin-releasing hormone (GnRH). This hormone prompts the pituitary

gland to produce raised levels of luteinizing hormone (LH) and FSH.

Within two days, ovulation is triggered by the high levels of LH. The egg is funneled into the fallopian tube and toward the uterus by waves of small, hair-like projections. The life span of the typical egg is only around 24 hours. Unless it meets a sperm during this time, it will die.

When you want to have a baby you can improve your chance of getting pregnant if you know about ovulation and the 'fertile window' in the menstrual cycle. Read more on ovulation and fertility window.

- **Luteal phase**

During ovulation, the egg bursts from its follicle, but the ruptured follicle stays on the surface of the ovary. For the next two weeks or so, the follicle transforms into a structure known as the corpus luteum. This structure starts releasing progesterone, along with small amounts of oestrogen. This combination of hormones maintains the thickened lining of the uterus, waiting for a fertilized egg to stick (implant). If a fertilized egg implants in the lining of the uterus, it produces the hormones that are necessary to maintain the corpus luteum. This includes human chorionic gonadotrophin (HCG), the hormone that is detected in a urine test for pregnancy. The corpus luteum keeps producing the raised levels of progesterone that are needed to maintain the thickened lining of the uterus. If pregnancy does not occur, the corpus luteum withers and dies, usually around day 22 in a 28-day cycle. The drop in progesterone levels causes the lining of the uterus to fall away. This is known as menstruation. The cycle then repeats.

- Premenstrual syndrome (PMS) – hormonal events before a period can trigger a range of side effects in women at risk, including fluid retention, headaches, fatigue and irritability. Treatment options include exercise and dietary changes
- Dysmenorrhea – or painful periods. It is thought that the uterus is prompted by certain hormones to squeeze harder than necessary to dislodge its lining. Treatment options include pain-relieving medication and the oral contraceptive

pill heavy menstrual bleeding (previously known as menorrhagia) – if left untreated, this can cause anemia. Treatment options include oral contraceptives and a hormonal intrauterine device (IUD) to regulate the flow

- Amenorrhea – or absence of menstrual periods. This is considered abnormal, except during pre-puberty, pregnancy, lactation and post menopause. Possible causes include low or high body weight and excessive exercise.