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Cyclic changes 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.

Breasts begin to form while the unborn baby is still growing in the mother’s uterus. This starts with a thickening in the chest area called the mammary ridge or milk line. By the time a baby girl is born, nipples and the beginnings of the milk-duct system have formed.

As a girl approaches her teen years, the first visible signs of breast development begin. When the ovaries start to produce and release (secrete) estrogen, fat in the connective tissue starts to collect. This causes the breasts to enlarge. The duct system also starts to grow. Often these breast changes happen at the same that pubic hair and armpit hair appear.

Once ovulation and menstruation begin, the maturing of the breasts begins with the formation of secretory glands at the end of the milk ducts. The breasts and duct system continue to grow and mature, with the development of many glands and lobules. The rate at which breasts grow is different for each young woman.

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.

Cyclic changes in the Vagina

The vagina and vulva of the ferret undergo well-marked cyclical changes in correlation with those of the ovaries and uterus.During the aneotrum the vulva is small and the connective tissue of which it is mainly composed is compact. The vagina during this period is lined by a low columnar epithelium consisting of only two or three rows of cells and without a cornified layer.

During the pro-œstrum and œstrus the vulva swells up to about fifty times its anœstrous size, the submucous connective tissue becoming spongy and the nuclei of the cells widely separated. The vaginal epithelium is several layers in thickness, and in the deeper part the cells become high and squamous. There is a pronounced cornified layer. Later, during cestrus, the cornified layer begins to slough, the process being continued over some time. The entire period represents the “follicular stage” of LOEB , and is presumably brought about by the action of œstrin. The vulval swelling serves the purpose of facilitating effective copulation which in the ferret is very prolonged.

During pregnancy and pseudo-pregnancy (the latter condition in the ferret only occurring under experimental conditions as after copulation with a vasectomised male) the vulva is reduced to its ancestrous size. The reduction is accompanied by lymphoid degeneration and an invasion of leucocytes. The vaginal epithelium becomes reduced to a low columnar or cubical structure. There is no cornified layer, this being completely shed during œstrus. This period clearly represents the “luteal phase” in the ovarian cycle.

It is to be noted that the vulval swelling and other characteristics of the follicular stage terminate with ovulation just as does the swelling of the sexual skin in the Primate.

Menstrual cycle

The average length of the menstrual cycle is 28–29 days, but this can vary between women and from one cycle to the next. The length of your menstrual cycle is calculated from the first day of your period to the day before your next period starts.

Girls get their first period (menarche), on average, between the ages of 11 and 14 years. By this stage, other sexual characteristics have developed, such as pubic hair and budding breasts.

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.

Phases of the menstrual cycle

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.

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 recognises these rising levels and releases a chemical called gonadotrophin-releasing hormone (GnRH). This hormone prompts the pituitary gland to produce raised levels of luteinising hormone (LH) and FSH.

Within two days, ovulation is triggered by the high levels of LH. The egg is funnelled

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.

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 fertilised egg to stick (implant).

If a fertilised 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.

Common menstrual problems

Some of the more common menstrual problems include:

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

dysmenorrhoea – 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 anaemia. Treatment options include oral contraceptives and a hormonal intrauterine device (IUD) to regulate the flow

amenorrhoea – or absence of menstrual periods. This is considered abnormal, except during pre-puberty, pregnancy, lactation and postmenopause. Possible

causes include low or high body weight and excessive exercise.