Name : omosebiola jesutosimi Course : phs212 Matric no : 18/mhs07/04

1]Cyclic changes in the vagina

Vaginal cytology was evaluated weekly over 12 months in 20 adult female Cynomolgus monkeys (Macaca fascicularis). After sacrifice of the animals the histology of the ovaries, uterus and vagina were studied in different phases of the menstrual cycle. The cytological examination of the vaginal smears showed that the superficial cells increased in number towards the middle of the cycle and the number of intermediate cells declined gradually. Parabasal cells were observed mainly at the beginning of the cycle; they disappeared towards the middle of the menstrual cycle. During the early follicular phase, the cells were moderately separated from each other, and during the second half of the proliferative or follicular phase, the superficial cells appeared clumped together. Leucocytes were usually absent except for at the beginning of the cycle and in the last few days of the late secretory or luteal phase. The maturation index of the vaginal smears can be considered as a tool for distinguishing the different phases of the menstrual cycle. The microscopic examination of the genital organs showed that during the proliferative or follicular phase of the cycle, which corresponds to the development of the ovarian follicles, the uterus showed growth of endometrial glands, stroma and endothelial cell proliferation with capillary sprouts. Shortly after ovulation and parallel to the formation of the corpora lutea, the endometrium enters the secretory or luteal phase, which is characterized by coiling of endometrial glands, glandular secretion and the differentiation of the spiral artery. The most striking changes in the vagina, is the marked basal cell proliferation and thickening of the stratum granulosum during the follicular phase of the menstrual cycle. The histological changes observed in the vagina demonstrated a good correlation with the observation on cytological examination of the smears. The present study demonstrated that the process of angiogenesis in the uterus during the different phases of the menstrual cycle is a multiple phenomenon involving proliferation, maturation and differentiation.

2] cyclic changes in the breast

Cyclic changes in the sex steroid hormone levels during the menstrual cycle profoundly influence breast morphology. Under the influence of follicle-stimulating hormone and luteinizing hormone during the follicular phase of the menstrual cycle, increasing levels of estrogen secreted by the ovarian graafian follicles stimulate breast epithelial proliferation. During this proliferative phase, the epithelium exhibits sprouting, with increased cellular mitoses, RNA synthesis, increased nuclear density, enlargement of the nucleolus, and changes in other intercellular organelles. In particular, the Golgi apparatus, ribosomes, and mitochondria increase in size or number. During the follicular phase, at the time of maximal estrogen synthesis and secretion in midcycle, ovulation occurs. A second peak occurs in the midluteal phase, when luteal progesterone synthesis is maximal. Similarly, progestogens induce changes in the mammary epithelium during the luteal phase of the ovulatory cycles. Mammary ducts dilate, and the alveolar epithelial cells differentiate into secretory cells, with a partly monolayer arrangement. The combination of these sex steroid hormones and other hormones results in the formation of lipid droplets in the alveolar cells and some intraluminal secretion.

The changes in breast epithelium in response to hormones are mediated through either intracellular steroid receptors or membrane-bound peptide receptors. The presence of steroid receptors for estrogen and progestogens in the cytosol of normal mammary epithelium has been demonstrated. Through the binding of these hormones to specific receptors, the molecular changes, with their observed morphologic effects, are induced as physiologic changes. Similarly, membrane receptors are present to mediate the actions of prolactin. Increases in endogenous estrogen can also exert a histamine-like effect on the mammary microcirculation, resulting in an increased, maximal blood flow 3 to 4 days before menstruation, with an average increase in breast volume of 15 to 30 cm3. Premenstrual breast fullness is attributable to increasing interlobular edema and enhanced ductular-acinar proliferation under the influence of estrogens and progestogens. With the onset of menstruation, after a rapid decline in the circulating levels of sex steroid hormones, secretory activity of the epithelium egresses.

3] hormonal regulation of the menstrual cycle :

The ovarian hormones circulate in the blood and are excreted in modified forms in the urine. Estimation of the urinary output by chemical methods gives an indication of the blood levels and of the total production of these substances The cyclic events in the ovary that have already been mentioned depend on gonadotropic hormones secreted by the anterior lobe of the pituitary gland; this gland is situated in a small recess at the base of the skull. There are two, and possibly three, gonadotropic hormones: (FSH), luteinizing hormone (LH), and, possibly, luteotropic hormone (LTH).

FSH is secreted in greatest amount in the first half of the menstrual cycle, and LH has its peak of secretion at mid-cycle. It is believed that the sequential action of FSH and LH causes ripening of the follicle and ovulation . In some animals LTH is necessary for maintenance of the corpus luteum, but in women under treatment for infertility ovulation has been successfully induced with FSH and LH alone. Multiple births, as the result of multiple ovulation, have occurred after excessive doses of FSH have been given.