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**QUESTION;**

I expect more on the physiology of lactation and details on the physiology of pregnancy in a normal woman.

ANSWERS;

The normal physiology of lactation is a process that begins to take effect well before the initial latch of the newborn infant. It requires the breast to change in composition, size, and shape during each stage of female development. Development includes puberty, pregnancy, and lactation. These stages are influenced by a cascade of physiologic changes that are crucial to successful breastfeeding.

During pregnancy, stage-II mammogenesis (alveolar development and maturation of the epithelium) occurs largely in response to higher levels of progesterone. The increased volume of breast tissue during pregnancy is a result of the proliferation of secretory tissue. In early pregnancy, lobule type 3 is formed due to the influence of chorionic gonadotropin. These newly formed lobules have larger size and number of epithelial cells composing each acinus. In late pregnancy, the proliferation of new acini are reduced, and the lumen becomes distended with secretory material or colostrum. During labor and lactation, further growth and differentiation can be seen in the lobule along with milk secretion. The glandular component of the breast has now increased to the point where it is mainly formed of epithelial elements and very little stroma. This will persist throughout lactation. Normal lactation involves the female breast, anterior lobe of the pituitary, and the posterior lobe of the pituitary.

Lactogenesis is the process of developing the ability to secrete milk and involves the maturation of alveolar cells. It takes place in 2 stages: secretory initiation and secretory activation.

Stage I lactogenesis (secretory initiation) takes place during the second half of pregnancy. The placenta supplies high levels of progesterone which inhibit further differentiation. In this stage, small amounts of milk can be secreted by week 16 gestation. By late pregnancy, some women can express colostrum.

Stage II lactogenesis (secretory activation) starts with copious milk production after delivery. With the removal of the placenta at delivery, the rapid drop in progesterone, as well as the presence of elevated levels of prolactin, cortisol, and insulin, are what stimulate this stage. Usually, at days 2 or 3 postpartum, most women experience swelling of the breast along with copious milk production. In primiparous women, the secretory activation stage is slightly delayed, and early milk volume is lower. Lower milk volume is also observed in women who had cesarean births compared with those who delivered vaginally. Late onset of milk production has also been seen in women who have had retained placental fragments, diabetes, and stressful vaginal deliveries. With retained placental fragments, lactogenesis stage II could be inhibited by the continued secretion of progesterone and would continue to be inhibited until removal of the remaining placental fragments. Lactation is maintained by regular removal of milk and stimulation of the nipple, which triggers prolactin release from the anterior pituitary gland and oxytocin from the posterior pituitary gland. For the ongoing synthesis and secretion of milk, the mammary gland must receive hormonal signals; and although prolactin and oxytocin act independently on different cellular receptors, their combined action is essential for successful lactation.

Prolactin is a polypeptide hormone synthesized by lactotrophic cells in the anterior pituitary and is structurally similar to growth hormone and placental lactogen.

During pregnancy, a woman’s body changes in many ways due to the effect of hormones. These changes can sometimes be uncomfortable, but most of the time they are normal and enable her to nourish and protect the fetus, prepare her body for labour, and develop her breasts for the production of milk. A woman will produce more oestrogen during one pregnancy than throughout her entire life when not pregnant. During pregnancy, oestrogen promotes maternal blood flow within the uterus and the placenta. At 12 weeks’ gestation (near the end of the first trimester, i.e. three-month period), the fundus (upper margin of the body of the uterus) may be palpated (felt) through the abdomen above the pubic bone (symphysis pubis). The size of the uterus usually reaches its peak at about 36 weeks’ gestation.