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PHYSIOLOGY

PHS 204

ENDOCRINOLOGY

## LACTATION

Lactation describes the secretion of milk from the mammary glands. These glands are enlarged during pregnancy and after childbirth. Although, mammary growth begins during pregnancy under the influence of ovarian and placental hormones. The milk production is held back during pregnancy.

Estrogen stimulates growth of ductal system of the breasts. Hormones such as; growth hormone, prolactin, the adrenal glucocorticoids, and insulin. Each of these hormones is known to play at least some role in protein metabolism. Progesterone is required for full development of the lobule-alveolar system. It acts synergistically with estrogen as well as the previous hormones mentioned, which cause additional growth of the breast lobules, with budding of alveoli.

Prolactin enhances lactation. It is secreted by the mother's anterior pituitary gland, and its concentration in her blood rises steadily from the fifth week of pregnancy until birth of the baby, at which it rises from 10-20 times the normal nonpregnant level.

The hypothalamus secretes prolactin inhibitory hormone, which plays a role in controlling prolactin secretion.

Oxytocin also plays an important role in lactation, in the let-down process. When the baby suckles, it receives no milk for the first half minute or so. Sensory impulses must first be transmitted through somatic nerves from the nipples to the mother's spinal cord and then to her hypothalamus, where they cause nerve signals that promote oxytocin secretion at the same time that they cause prolactin secretion. The oxytocin is carried in the blood to the breasts, where it causes myoepithelial cells, which surrounds the alveoli, to contract, thereby expressing the milk from the alveoli into the ducts at a pressure of +10 to 20mmHg. Then the baby's suckling becomes more effective in removing the milk. Thus, within 30 seconds to 1 minute after a baby begins to suckle, milk begins to flow. This process is called *milk ejection* or *milk let-down*.

Suckling on one breast causes milk flow not only in that breast but also in the opposite breast. Fondling the baby by the mother or hearing the baby cry often gives enough signal to the hypothalamus of the other to cause milk let-down.

Inhibition of milk ejection. A particular problem in nursing a baby comes from the fact that many psychogenic factors or even generalised sympathetic nervous system stimulation throughout the mother's body can inhibit oxytocin secretion and consequently depress milk ejection. For this reason, many mothers must have an undisturbed period of adjustment after childbirth if they are to be successful in nursing their babies.

### COMPOSITION OF MILK

CONSTITUENT	HUMAN MILK (%)	COW'S MILK (%)
WATER	88.5	87.0
FAT	3.3	3.5
LACTOSE	6.8	4.8
CASEIN	0.9	2.7
LACTALBUMIN AND OTHER PROTEINS	0.4	0.7
ASH	0.2	0.7

### PREGNANCY

This occurs when the ovum of a sexually mature female is fertilised by the sperm of a sexually mature male. It lasts for 40 weeks, counting from the first day of the woman's last normal period. It is grouped into three trimesters.

**During the first trimester**, the female body undergo many changes. Hormonal changes affect almost every organ system in her body. Her period stopping is a clear sign that she's pregnant. Other changes include:

1. Extreme tiredness
2. Tender, swollen breasts, in which her nipples may also stick out.
3. Upset stomach with or without throwing up known as morning sickness
4. Cravings or distaste of certain foods
5. Mood swings
6. Constipation, etc

as her body changes, she may need to make changes in her daily routine, such as going to bed earlier or eating frequent small meals.

Fortunately, most of these discomforts go away as the pregnancy progresses. But some women may not feel any discomfort at all. If one has been pregnant before, she may feel differently this time around. Pregnancy varies just as each woman is different from the other.

Most women find the second trimester of pregnancy easier than the first. But, it is just as important to stay informed about her pregnancy during these months. Though she may not have less signs of the previous trimester, at the end of this trimester, she may feel her baby moving. Her body changes, giving room for the developing baby. Some changes are:

1. Darkening of the skin around her nipple
2. Stretch marks on breasts, thigh, abdomen, buttocks.
3. Swelling of the ankles, fingers, and face.

#### Third trimester

Some of the discomforts in the second trimester extend into this trimester. Many women may find breathing difficult and notice the urge to urinate more often. This is because the baby is getting bigger and it puts pressure on the mother's organs. Some new body changes occur such as:

1. Shortness of breath
2. Heartburn
3. Trouble sleeping
4. Belly button may stick out
5. Tender breasts may leak watery pre-milk called colostrums.
6. Contractions, which could be a sign of real or false labour.

As the pregnant mother nears her due date, her cervix becomes thinner and softer (called effacing). This is a normal, natural process that helps the birth canal (vagina) to open during the birthing process. At this stage, she prepares to welcome her baby.