**MATRIC NUMBER: 18/MHS01/160**

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**COURSE CODE: PHS 204**

**DEPARTMENT: ANATOMY**

ASSIGNMENT: Discuss lactation and gestation in a normal female

**GESTATION PERIOD**

WHAT IS GESTATION? It is the fetal development period from the time of conception to the time of birth during which the embryo or fetus is developing in the uterus. The word gestation comes from the Latin word ‘gestare’ meaning to ‘carry or to bear’.

**WHAT IS GESTATION PERIOD?**

 Gestation period is the time interval of gestation. It is how long a woman is pregnant.

**LENGTH OF GESTATION**

 Length of gestation varies amongst women. For women, the full gestation period is normally nine months. The average length of human gestation is 280 days or 40 weeks from the first day of the woman’s last menstrual period.

The medical name for the due date is estimated date of confinement(EDC). However, only about 4% of women give birth on their EDC. Since some women are unsure of the date of their last menstruation (perhaps due to period irregularities), a baby is considered full term if its birth falls between 37 to 42 weeks of its estimated due date.

**PHYSIOLOGY OF GESTATION(PREGNANCY)**

The embryo is suspended in an amniotic sac surrounded by fluid during the 280 day gestation period. The umbilical cord attached at the navel connects it to the placenta, where it gets nutrients and oxygen. During the 1st trimester, all parts of the embryo are formed.

During the second trimester all parts start to function; during the last trimester the embryo is now called a fetus and the main task is growth. Labor, characterized by muscle contractions, dilation (to 10 cm) and effacement (thinning)of the cervix, and expulsion of the mucous plug that formed in the cervix, signals the onset of parturition. The childbirth process:

The cephalic, or head-first delivery, is the most common. breech is a backward presentation; Caesarian is delivery through an incision in the abdomen.

The umbilical cord is cut and clamped, and placenta (afterbirth) is delivered following birth of the baby.

The newborn may be covered with traces of vernix caseosa (cheesy coating) or lanugo (downy hair) that protected the skin before birth. The health of the baby is immediately evaluated on the APGAR scale: color, heartbeat, reflexes, muscle tone, and breathing are scored on a scale of 0-10.

Pregnancy can be complicated by certain conditions:

Placenta previa is the development of the placenta over the opening of the cervix

Preeclampsia is a pregnancy- induced hypertension (high blood pressure)

Spontaneous abortion or miscarriage is the loss of a fetus during the first 20 weeks, often due to abnormalities, trauma, or lifestyle choices.

Some of the physiological changes that occur during pregnancy

1. **Cardiovascular:**During pregnancy, your cardiac output - the amount of blood your heart pumps around your body per minute - increases to meet the needs of the developing fetus, and to provide the volume of blood necessary to fill the uteroplacental circulation.

During pregnancy, your growing uterus puts pressure on your veins making it harder for the blood to flow back to your heart. This causes the blood to pool in the veins making them swell.

1. **Renal**: Your kidneys are responsible for filtering waste products from your blood, and regulating blood pressure and electrolytes. During pregnancy, changes in kidney function approximately follow changes in cardiac function - both organs work considerably harder. By around the 20th week, and sometimes as early as the 8th to 10th week of pregnancy, your kidneys are filtering 30% to 50% more blood than before you were pregnant. The effects of this are greater reabsorption of sodium, and increased elimination of sugars (glycosuria), amino acids (aminoaciduria), and creatinine in your urine (creatinine clearance tests are often used by doctors as a measure of how well your kidneys are working). After about the 12th week of pregnancy, progesterone, a smooth muscle relaxant, causes the tubes that transport urine from the kidneys to the bladder, called the ureters, to dilate. As your uterus expands, it may compress the dilated ureters, obstructing the flow of urine to your bladder, and increasing the chances that you get a urinary tract, or kidney infection while you are pregnant. Laying down on your side can help relieve the pressure on your major blood vessels letting your kidneys work more effectively. However, this can make for a lot of urine production and toilet breaks during the night when you are trying to sleep.
2. **Hormonal**: The menstrual cycle refers to the normal changes in your ovaries and uterus that make an egg accessible for fertilization and prepare your uterus for pregnancy. It typically occurs once every 28 days. If you are ovulating normally, an egg, or ovum emerges from one or other of your ovaries, leaving behind a structure called the corpus luteum. This structure produces large amounts of progesterone and estrogen, hormones that help prepare your uterus for implantation of a fertilized egg. If the egg is not fertilized, the corpus luteum degenerates, causing progesterone and estrogen levels to drop, and menstruation to begin. If the ovum is fertilized, on the other hand, the corpus luteum remains intact and continues to maintain the hormone levels you need to keep your uterus baby-friendly. Eventually, the placenta develops the ability to secrete the necessary hormones itself, and the corpus luteum typically disappears after 3 to 4 months.

In addition to progesterone and estrogen, human chorionic gonadotropin also spikes in early pregnancy. The levels of this hormone double every two days in the first 10 weeks of pregnancy. Its primary role is to prevent any further menstruation, and to prepare the placenta - the organ that connects the fetus to the uterus. The placenta allows the fetus to be supplied with nutrients and oxygen, as well as providing a route for the removal of toxic waste products.

1. **Respiratory**: Breathing exercises are often practised by expectant mothers to use during labour and birth, but this isn’t the only way changes in respiration are helpful. As with your other organs, the growing uterus begins to invade the space normally reserved for your lungs, which restricts their expansion during normal breathing. Once again, progesterone, the multi-talented pregnancy hormone gets to work, triggering your lungs to increase the amount of air inhaled with each breath - the tidal volume - as well as the number of breaths per minute - the respiratory rate. This increases the oxygen supply required to meet the metabolic needs of the fetus, placenta and other organs.
2. **Metabolic**: Changes in metabolism during pregnancy alter the distribution of body fat, as well as how you digest and process food. While accumulating fats and nutrients is necessary for the healthy growth of your baby, metabolic changes can also affect the way in which medications are processed.

**LACTATION**

**What is lactation?** Lactation describes the secretion of milk from the mammary glands.

**PHYSIOLOGY OF LACTATION**

 Normally, the natural production of breast milk (lactation) is triggered by a complex interaction between three hormones estrogen, progesterone and human placental lactogen during the final months of pregnancy.

During pregnancy, Lactation indicates the mammary glands are becoming functional. The breast size before pregnancy does not determine the amount of milk a woman will produce.

Although mammary growth begins during pregnancy under the influence of ovarian and placental hormones, and some milk is formed, copious milk secretion sets in only after delivery. Since lactation ensues after a premature birth, it would appear that milk production is held back during pregnancy. The mechanism by which this inhibitory effect is brought about, or by which lactation is initiated at delivery, has long been the subject of an argument that revolves around the opposing actions of estrogen, progesterone, and prolactin, as studied in laboratory animals, goats, and cattle. During pregnancy the combination of estrogen and progesterone circulating in the blood appears to inhibit milk secretion by blocking the release of prolactin from the pituitary gland and by making the mammary gland cells unresponsive to this pituitary hormone. The blockade is removed at the end of pregnancy by the expulsion of the placenta and the loss of its supply of hormones, as well as by the decline in hormone production by the ovaries, while sufficient estrogen remains in circulation to promote the secretion of prolactin by the pituitary gland and so favour lactation.

For lactation to continue, necessary patterns of hormone secretion must be maintained; disturbances of the equilibrium by the experimental removal of the pituitary gland in animals or by comparable diseased conditions in humans quickly arrest milk production. Several pituitary hormones seem to be involved in the formation of milk, so that it is customary to speak of a lactogenic (“milk-producing”) complex of hormones. To some degree, the role of the pituitary hormones adrenocorticotropin, thyrotropin, and growth hormone in supporting lactation in women is inferred from the results of studies done on animals and from clinical observations that are in agreement with the results of animal studies. Adrenal corticoids also appear to play an essential role in maintaining lactation.

The stimulus of nursing or suckling supports continued lactation. It acts in two ways: it promotes the secretion of prolactin (and possibly other pituitary hormones of value in milk formation), and it triggers the release of yet another hormone from the pituitary gland—oxytocin, which causes the contraction of special muscle cells around the alveoli in the breast and ensures the expulsion of milk. It is in this way that a baby’s sucking at one breast may cause an increase in milk flow from both, so that milk may drip from the unsuckled nipple. About 30 seconds elapse between the beginning of active suckling and the initiation of milk flow.

The nerve supply to the mammary glands is not of great significance in lactation, for milk production is normal after the experimental severing of nerves to the normal mammary glands in animals or in an udder transplanted to the neck of a goat. Milk ejection, or “the draught,” in women is readily conditioned and can be precipitated by the preparations for nursing. Conversely, embarrassment or fright can inhibit milk ejection by interfering with the release of oxytocin; alcohol, also, is known to block milk ejection in women, again by an action on the brain. Beyond its action on the mammary glands, oxytocin affects uterine muscle, so that suckling can cause contractions of the uterus and may sometimes result in cramp. Since oxytocin release occurs during sexual intercourse, milk ejection in lactating women has been observed on such occasions. Disturbance of oxytocin secretion, or of the milk-ejection reflex, stops lactation just as readily as a lack of the hormones necessary for milk production, for the milk in the breast is then not extractable by the infant.