PHYSIOLOGY OF LACTATION

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. The process of lactation and can be negatively affected by anything that interrupts the normal development of the female breast, or that interferes with the production of milk. Women who have had breast augmentation may experience issues with lactation and breastfeeding, but this is dependent on the location of the incision.

In the post-partum period, some women may experience difficulty with lactation if they have inadequate milk production, poor milk extraction, and insufficient caloric intake to meet demands.Normal lactation involves the female breast, anterior lobe of the pituitary, and the posterior lobe of the pituitary.

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.

PHYSIOLOGY OF PREGNANCY IN NORMAL WOMEN

Pregnancy

Pregnancy is the time from fertilization of an egg, also known as conception, to birth. Getting pregnant and growing a human from scratch is a very complicated biological process that takes a lot of resources. As a result, pregnancy can have a wide range of effects on the mother, both physically and emotionally.

Each egg that is released during a menstrual cycle travels to your uterus. However, unlike unfertilized eggs that proceed unaltered and then disintegrate when they get there, a fertilized egg develops into a tiny human embryo on the way. On reaching the uterus, the embryo implants itself in the uterine wall, develops into a fetus, and steadily grows, until about nine months later it is ready to emerge into the outside world as a newborn baby.

Physiological changes that occur during pregnancy

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.

and relatively low glucose promotes the use of fat for energy, preserving glucose and amino acids for the fetus.

Gestational diabetes is thought to reflect a pronounced insulin resistance of this sort.

HbA1c is not considered suitable for use in pregnancy, as normal range changes and suitable reference ranges have not been established.[5]

Cardiovascular system changes[2]

There is peripheral vasodilation.

Cardiac output increases by 20% by week 8, and then further up to 40% increase, maximal at week 20-28 weeks In labour there is further increase in cardiac output and then a huge increase immediately after delivery, followed by return to normal within around an hour.

Contributing to the increased cardiac output are increased stroke volume and an increase in heart rate of 10-20 beats per minute.

Blood pressure is lower than normal in the first two trimesters but returns to normal in the third.

Venous return in the inferior vena cava can be compromised in late pregnancy if a woman lies flat on her back due to pressure from the uterus, resulting in reduced stroke volume and cardiac output. This is relieved by lying in the left lateral position. Reduced cardiac output can compromise fetal blood supply.

There is an increased risk of pulmonary oedema if there is an increase in blood volume, or increased pulmonary capillary permeability secondary to pre-eclampsia. The highest risk time is the second stage of labour or immediate postpartum period when cardiac output is high.