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ELUCIDATE THE PHYSIOLOGICAL ADAPTATIONS OF THE FEMALE TO PREGNANCY.

During pregnancy, the female body changes in various ways from their organs, body weight, metabolic activities and functions of various physiological systems, these makes the body ready for the pregnancy.

Some of the adaptations occur in;

1, THE OVARIES

Corpus luteum enlarges and secretes a large quantity of progesterone and little estrogen which are important in the maintenance of pregnancy. This continues for 3 months, and then the corpus luteum degenerates. By this time the placenta is already fully developed and it starts secreting estrogen and progesterone and this continues throughout the period of pregnancy. follicular changes do not appear in the ovary and ovulation does not occur during pregnancy because secretion of LH and FSH is inhibited.

2, EXCRETORY SYSTEM

Flow of renal blood and GFR increases during pregnancy and this results in increased urine formation. This happens because of increased fluid intake and excretory products from the fetus. In the first trimester, the frequency of micturition increases because of the pressure exerted by the uterus on the bladder.

3, NERVOUS SYSTEM

Generally during pregnancy, the nervous system is excited. This excitation leads to the psychological imbalance such as change in moods. The female becomes more excited as delivery date draws near because of the anticipation of delivery of the baby, the labor, etc.

4, RESPIRATORY SYSTEM

During pregnancy, the overall activity of the respiratory system slightly increases. The tidal volume, oxygen utilization, and pulmonary ventilation increases. Because of the basal metabolic rate of pregnant women and their greater size, the total amount of oxygen used by the mother shortly before the birth of the baby is about 20% above normal, and a substantial amount of carbon dioxide is formed. These effects result in increased minute ventilation of the mother. Progesterone increases the respiratory center’s sensitivity to carbon dioxide, hence, it is believed that high levels of progesterone during pregnancy increases

the minute ventilation more. Respiratory rate is increased to maintain the extra ventilation.

5, BLOOD

There is increase in blood volume during pregnancy, this 20% increase is mainly because there is also an increase in plasma volume and this causes hemodilution. The cause of the increased volume is likely due partly to aldosterone and estrogens, which are highly increased during pregnancy and partly to increased fluid retention by the kidneys. Also, the bone marrow becomes increasingly active and produces extra red blood cells to go with the excess fluid volume. There is risk of anemia in the mother because of the increased demand for iron by the fetus.

6, METABOLIC ACTIVITIES.

During pregnancy, metabolic activities in the body are accelerated as a result of increased secretion of various hormones like thyroxine, cortisol, etc. There is increase in;

- The basal metabolic rate; increased thyroxine secretion results in an increase in basal metabolic rate by about 15% in the later stages of pregnancy.

- Lipid metabolism; deposition of about 3 to 4 kg of fat in the body occurs during pregnancy. And this increases the blood cholesterol level and ketosis.
- Protein metabolism; the deposition of protein increases in the uterus and the anabolism of protein increases during pregnancy, thus, positive nitrogen balance occurs.
- Water and mineral metabolism; secretion of estrogen and progesterone first by the corpus luteum and then by the placenta increases the retention of sodium and water. Secretion of aldosterone also increases during pregnancy and aldosterone in turn increases the reabsorption of sodium from renal tubules. There is also retention of calcium and phosphorus which are necessary for the growing fetus.
- Carbohydrate metabolism; during pregnancy, blood glucose level increases and this leads to glucosuria. Because of this and other reasons, there is hyperplasia of beta cells of islets of Langerhans in pancreas resulting in the increased secretion of insulin.

7, CARDIAC OUTPUT.

In the first trimester, cardiac output increases by about 30% and then after the 3rd month, it starts decreasing until it reaches almost the normal level during the end stages of pregnancy.

8, BLOOD PRESSURE.

During the first trimester, arterial blood pressure remains unchanged. But there is a slight decrease in blood pressure during the second trimester and this is as a result of the diversion of blood to the uterine sinuses.

9, DIGESTIVE SYSTEM.

Morning sickness occurs in the female during the early stages of pregnancy, it involves nausea, vomiting and giddiness. This occurs as a result of hormonal imbalance. Also, the motility of GI tract decreases by progesterone and constipation is common.

10, CERVIX

During pregnancy, the number of glands, blood supply, and mucus secretion in the cervix increases. The normally tough and strong cervix becomes soft and it is closed by mucus plug.

11, MAMMARY GLANDS.

The size of the mammary glands increases during pregnancy because of developments of new ducts and alveoli, deposition of fat, and increased vascularization. Also, pigmentation of the nipple and areola occurs.

12, BODY WEIGHT

There is increase in body weight during pregnancy. The body gains an average weight of about 12kg during pregnancy. The approximated weight of various structures which adds to weight gain are;

- Fetus; 3.5kg
- Amniotic fluid; 2.0kg
- Placenta; 1.5kg
- Increase in maternal body weight; 5.0kg.

The extra fluid is excreted in the urine during the first few days after birth, that is, after loss of fluid retaining hormones from the placenta. There's often an increased desire for food during pregnancy, partly as a result of removal of food substrates from the mother's blood by the fetus and partly because of hormonal factors. If proper prenatal care is not taken, the body weight increases by about 20 to 30 kg.

13, VAGINA

The vagina increases in size during pregnancy, its color changes to violet due to increased blood supply and there is deposition of glycogen in the epithelial cells.

14, FALLOPIAN TUBE

During pregnancy, there is an increase in the number of epithelial cells and blood supply in the fallopian tubes.

15, UTERUS

As the fetus develops, there are changes in the volume, size, shape, and weight of the uterus.

- Weight; a non-pregnant uterus weighs about 30 to 50 g, this increases as the pregnancy develops. In the final stages of pregnancy, the uterine weight increases to about 1000 to1200g.
- Shape; a non-pregnant uterus has a pyriform shape. At around the 12^{th} week of pregnancy, it becomes Globular in shape and then it becomes pyriform gradually once again.
- Volume; as the fetus develops, the volume of the uterus increases. The uterus reaches about 5 to 7 liters at the end of pregnancy.
- Size; there is increase in the uterus size due to Hyperplasia (increase in number of cells) of myometrium, Hypertrophy (increase in size of the cells) of myometrium, and The growth of the fetus.