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Department: Nursing Science

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## Assignment

Elucidate the physiological adaptations of the female to pregnancy

Physiological changes are made to the woman body as a result of the hormones produced by the placenta during pregnancy and the growing uterus.

- Endocrine changes

1. Woman colonic gonadotropin mimics the function of luteinizing hormones and stimulates increase production of estrogen and progesterone in pregnancy causes a negative feedback on the production of follicle stimulating hormone and luteinizing hormone from the anterior pituitary gland. The inhibition of these hormones prevents ovulation in pregnancy.
2. Some endocrine glands are enlarged in pregnancy; these are the pituitary gland, the thyroid gland, the adrenal gland and the parathyroid gland
3. There is increased secretion of erythropoietin
4. There is bitter cell hyperplasia in the islets of langerhans of the pancreas, and this could bring about increased insulin secretion. The increased insulin and cortisol secretion could make pregnancy to be a diabetogenic state. A few women may develop diabetes for the first time during pregnancy, this condition is known as gestational diabetes and usually resolves after pregnancy
   - Cardiovascular Changes
   1. Increased secretion of progesterone, being a hormone that brings about vascular relaxation, brings about reduction in foetal peripheral resistance. Progesterone also causes an increase in

urinary excretion of sodium. This brings about the activation of draining and detency system which causes increase in aldosterone. As a result, there is increase in plasma volume to about 50%, there is also about 40%increase in cardiac output during pregnancy.

2. Heart rate is increased
3. Blood pressure is slightly decreased especially diastolic blood pressure. Owing to the decrease, there could be surpine hypotension in late gestation as the uterus falls backward unto the inferior vene cava would reduce venous return, and that is why pregnant women during second and third trimester are not advised to lie on their back but rather to lie on their side.

- Haematological changes
  1. There is increased erythrocyte segmentation rate
  2. Increased production of fibrinogen and clotting factors, especially factors 7&8
  3. There is increased red blood cell production; however, the increase in red blood cell production is not commensurate with the increase in plasma volume. As a result, there is decreased haematocrit coupled with reduced iron and folate due to increase demand placed by the foetus, a pregnant woman could have physiological anaemia and this is why pregnant women are given iron and folate supplements in order to increase red blood cells in commensurate proportion with increase in plasma volume.
- Renal Changes
  1. There is about 50% increase in glomerular pupation rate
  2. Renal plasma flow increases
  3. Kidney size increase
  4. Sodium and potassium retention increases
  5. Excretion of bicarbonate, glucose and protein increases
  6. There is dilatation of urethras
  7. Decrease bladder tone, this is responsible for the increase frequency of urination in pregnancy.

8. Progesterone brings about increased chemoreceptor sensitisation which gives rise to hyperventilation and reduced carbon IV oxide tension. This could lead to alkalosis and consequently increased excretion of bicarbonate and sodium which may result in reduced plasma osmolarity

- Respiratory Changes
  1. Since there is hyperventilation, the respiratory volumes are increased except the residual volume which is decreased as a result of the upward displacement of the diaphragm by the growing uterus; this brings about increased intra-abdominal pressure and a reduction in residual volume.
  2. Reduction in residual volume would bring about a reduction in functional residual capacity
  3. Oxygen tension is increased
- Metabolic changes
  1. There is rise in blood glucose level, which may give rise to insulin resistant
  2. Basal metabolic rate and body weight are increased
  3. There is hyperlipidemia
  4. Increased protein depreciation
- Gastro-intestinal changes
  1. There could be nausea and vomiting, especially in the first trimester due to the increasing HCG level or indigestion
  2. There is reduced muscle tone and motility in the GI tract
  3. There is also increased gastro-oesophageal reflex which may give rise to heart burn during pregnancy
- Structural changes
  1. Hypertrophy and hyperplasia of the uterus, the cervix and the breast.
  2. The Uterus becomes spherical
  3. The cervix softens
  4. Nipples become enlarged; and
  5. There is increased areolar pigmentation