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The physiological adaptations of the female to pregnancy.

Endocrine changes.

- Placental hormones – HCG, oestrogen, progesterone, etc.
- FSH and LH inhibition prevents ovulation.
- PG (pituitary gland) and TG (thyroid gland) enlarges.
- Adrenal and parathyroid glands are slightly enlarged.
- There is an increased secretion of erythropoietin.
- There is B cell hyperplasia which can bring about increased insulin secretion.
- Increased secretion of cortisol.

N.B; increased secretion of insulin and cortisol can make pregnancy a diabetogenic state.

Few women get gestational diabetes and is resolved after pregnancy.

Cardiovascular changes.

- Increased secretion of progesterone brings about reduction in the total peripheral resistance.
- Progesterone also causes an increase in urinary excretion of sodium. This brings about RAS activation.
- RAS activation brings about increase in aldosterone and as a result, there is increase in plasma volume up to about 50%.
- Increase in plasma volume brings about approximately 40% increase in cardiac output during pregnancy.
- Increase in heart rate.
- Slight reduction in blood pressure especially diastolic blood pressure.

- Due to the decrease in diastolic blood pressure, there can be supine hypotension in late gestation. This is why pregnant women are not advised to lie on their backs but rather in their sides.

Changes in hematology.

- Increased erythrocyte segmentation rate.
- Increased production of fibrinogen and clotting factors especially clotting factors VII and VIII.
- Increased red blood cells production which brings about reduced hematocrit along with reduced iron and foliate.

Renal changes.

- Increased glomerular filtration rate of about 50%.
- Increase in renal plasma flow.
- Increase in size of kidney
- Increased sodium and potassium retention increases.
- Excretion of bicarbonate, glucose and protein increases.
- Dilation of ureter and decreased bladder tone which is responsible for the increased frequency of urination in pregnancy.

Changes in blood osmolarity.

Progesterone brings about increased chemoreceptors sensitization and this gives rise to hyperventilation and reduced CO_2 tension. This can lead to alkalosis and increased excretion of bicarbonate and sodium which may result in reduced plasma osmolarity.

Respiratory changes.

- Due to 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.
- A reduction in residual volume which brings about a reduction in functional residual capacity.

- Oxygen tension is increased and there is a right shift to the oxygen-hemoglobin dissociation curve.

Metabolic changes.

- There is a rise in blood glucose level which may result in insulin resistance.
- Basal metabolic rate and body weight are increased.
- There is hyperlipidaemia.
- There is increase in protein deposition.

Changes in the GIT.

- There is nausea and vomiting(especially in the first trimester) due to the increase in HCG level or indigestion.
- Reduced muscle tone and motility.
- There is increased gastro-oesophageal relax which may give rise to heart burn.
- Slow emptying of the gall bladder.
- There is regurgitation of alkaline chyle into the stomach. This is known as hypochlorhydria.

Structural changes.

Some structural changes include:

- Hypertrophy and hyperplasia of the uterus, cervix and the breast.
- Uterus becomes spherical.
- The cervix softens.
- The nipples are enlarged.
- There is increased pigmentation of the areola.