

NORMAL PHYSIOLOGY OF PREGNANCY

1. CVS

HEART

- pushed upwards and rotated forwards with lateral displacement of the left border
- The apex moves from the 4th – 5th ICS
- Volume increases 12%
- ESM normal
- Increased LV thickness

ECG

- decreased voltage QRS
- deep Qs
- flat / inverted T

PHYSIOLOGICAL FACTORS

- CO increases by 40% and can increase by a further 2l / min during established labour
- SV increases from 64 to 71 ml
- HR increases
- SBP unchanged
- DBP falls 1st & 2nd TM
- decreased PVR (peripheral vasodilatation secondary to Oestrogen and Progesterone and increased endothelial synthesis PGE2 & Prostacyclins)
- Venous BP increases in legs but not arms

ORGAN BLOOD FLOW

- increased generally especially kidneys and skin
- uterus = 700ml / min at term

BLOOD

- 40% increase in plasma volume
- 25% increase RBC mass
- BUT therefore dilutional decrease in Hb / Hct
- Increased total WCC
- Neutrophilia
- Lymphocytes unchanged
- Eosinophils unchanged but dramatic decrease in labour / delivery
- decreased platelets
- MCH unchanged
- MCV small increase
- Increased RBC fragility
- ESR increased

COAGULATION

- increased factors VII, VIII, IX, X, XII, fibrinogen, FDPs, vonWF
- decreased XI, AT3
- increased fibrinolysis

2. RS

ANATOMY

- diaphragm rises by 4cm
- transverse diameter of chest increases by 2cm
- subcostal angle increases from 68-103 degrees

PHYSIOLOGICAL FACTORS

- O₂ consumption increases 15-20%
- RR unchanged
- VC increases in some
- IC increases
- ERV decreases
- RV decreases
- FRC decreases
- TV increases and therefore MV increases by 40%
- FEV unchanged

3. RENAL

ANATOMY

- kidneys increase 1 cm in length
- dilatation of collecting system

FUNCTION

- blood flow increases 70-80% by mid-pregnancy (decreases 3rd TM but still 50-60% greater)
- GFR increases 60% (decreased urea, creat)
- Increased excretion glucose, water sol. vitamins, serum proteins
- Decreased plasma osmolality

4. GI

Effects largely due to smooth muscle relaxation secondary to Progesterone

- gum swelling
- decreased LOS competence
- decreased secretion gastric enzymes
- decreased gastric tone and motility
- increased gastric emptying time
- decreased Small Bowel and Large Bowel motility

5. Immune System

- increased TWCC by 30%
- slight decrease IgG
- slight increase IgD
- increased susceptibility to some infections (polio, influenza, malaria)

6. Also

- decreased Albumin (dilutional)
- increased ALP (increased osteoclastic activity)
- increased T3, T4, TBG but normal fT3, fT4