

NAME: ODITA IFEANYICHUKWU JORDAN

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DEPARTMENT:NURSING SCIENCE

Assignment

Physiological adaptations of females to pregnancy

During pregnancy a woman undergoes some physiological changes so as to accommodate the new growing foetus, these changes are entirely normal and could range from behavioural, cardiovascular, haematologic, metabolic, renal, posture and respiratory changes. Increases in blood sugar, breathing, and cardiac output are all expected changes that allow a pregnant woman's body to facilitate the proper growth and development of the embryo or fetus during the pregnancy. The pregnant woman and the placenta also produce many other hormones that have a broad range of effects during the pregnancy.

Hormonal changes:

Pregnant women experience numerous adjustments in their endocrine system that help support the developing fetus. The fetal-placental unit secretes steroid hormones and proteins that alter the function of various maternal endocrine glands. Sometimes, the changes in certain hormone levels and their effects on their target organs can lead to gestational diabetes and gestational hypertension .

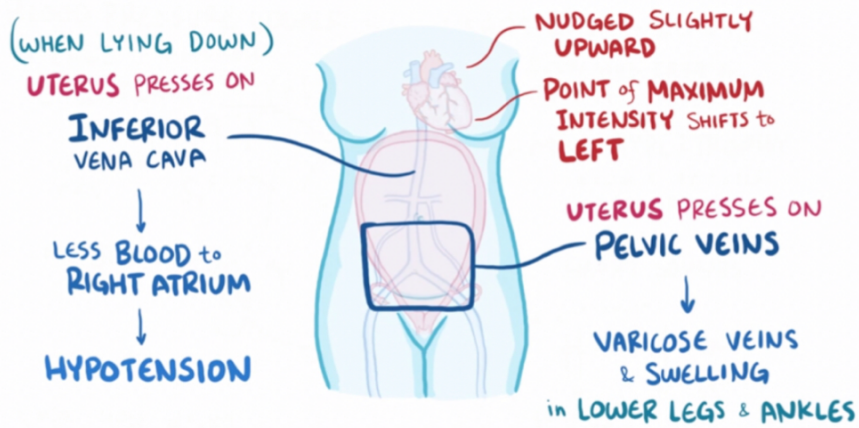
Breast size :

A woman's breasts grow during pregnancy, usually 1 to 2 cup sizes and potentially several cup sizes. A woman who wore a C cup bra prior to her pregnancy may need to buy an F cup or larger bra while nursing. Once the baby is born up to about 50–73 hours after birth, the mother

will experience her breasts filling with milk (sometimes referred to as “the milk coming in”). Once lactation begins, the woman's breasts swell significantly and can feel achy, lumpy and heavy (which is referred to as engorgement). Her breasts may increase in size again by an additional 1 or 2 cup sizes, but individual breast size may vary depending on how much the infant nurses from each breast. A woman's breasts will usually reduce in size, but may remain about 1 cup size larger than prior to her pregnancy. Changes in breast size during pregnancy may be related to the sex of the infant, as mothers of female infants have greater changes in breast size than mothers of male infants.

Cardiovascular changes :

The heart adapts to the increased cardiac demand that occurs during pregnancy in many ways. Cardiac output increases throughout early pregnancy, and peaks in the third trimester, usually to 30-50% above baseline. Estrogen mediates this rise in cardiac output by increasing the pre-load and stroke volume, mainly via a higher overall blood volume (which increases by 40-50%). The heart rate increases, but generally not above 100 beats/minute. Total systematic vascular resistance decreases by 20% secondary to the vasodilatory effect of progesterone. Overall, the systolic and diastolic blood pressure drops 10-15 mm Hg in the first trimester and then returns to baseline in the second half of pregnancy.



Uterine enlargement beyond 20 weeks' size can compress the inferior vena cava, which can markedly decrease the return of blood into the heart or preload. As a result, healthy pregnancy patients in a supine position or prolonged standing can experience symptoms of hypotension.

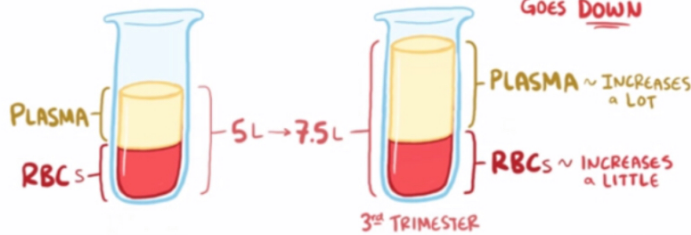
Haematological changes :

Plasma increases by 40-50% during pregnancy and the red blood cell volume increases by 20-30%. These changes occur mostly in the second trimester and prior to 32 weeks gestation. Erythropoietin, which stimulates red blood cell production, increases throughout pregnancy and reaches approximately 150 percent of their pregnancy levels at term. The effect of pregnancy on platelet count is unclear, with some studies demonstrating a mild decline in platelet count and other studies that show no effect. The white blood cell count increases with occasional appearance of myelocytes or metamyelocytes in the blood. During labor, there is a rise in leukocyte count. A pregnant woman will also become hypercoagulable, leading to increased risk for developing blood clots and embolisms, such as deep vein thrombosis and pulmonary embolism . Women are 4-5 times more likely to develop a clot during pregnancy and in the postpartum period than when they are not pregnant. Hypercoagulability in pregnancy likely evolved to protect women from hemorrhage at the time of miscarriage or childbirth.

CARDIOVASCULAR SYSTEM EXPANDS

* HIGH VOLUME STATE *

BLOOD VOLUME INCREASES
by 30-50%



PHYSIOLOGIC
ANEMIA of
PREGNANCY

(% of RBCs)
HEMATOCRIT
GOES DOWN

PLASMA ~ INCREASES
a LOT

RBCs ~ INCREASES
a LITTLE

3rd TRIMESTER

Changes in body weight :

Some degree of weight gain is expected during pregnancy. The enlarging uterus, growing fetus, placenta, amniotic fluid, normal increase in body fat, and increase in water retention all contribute weight gain during pregnancy. The amount of weight gain can vary from 5 pounds (2.3 kg) to over 100 pounds (45 kg). In the United States, the range of weight gain that doctors generally recommend is 25 pounds (11 kg) to 35 pounds (16 kg), less if the woman is overweight, more (up to 40 pounds (18 kg)) if the woman is underweight.

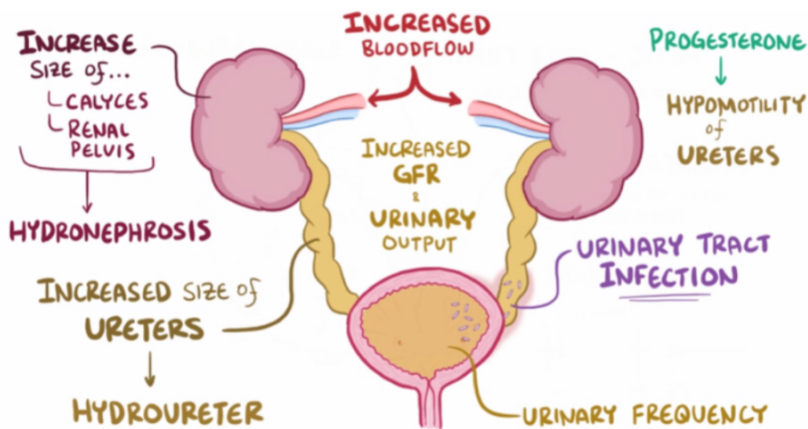
| | |
|--------|---------------------------------------|
| 16 wks | 3 finger widths above symphysis |
| 20 wks | 3 finger widths below umbilicus |
| 24 wks | at umbilicus |
| 28 wks | 3 finger widths above umbilicus |
| 32 wks | between umbilicus and xiphoid process |
| 36 wks | at costal arch |
| 40 wks | 1-2 finger widths below costal arch |



Renal changes :

Progesterone causes many changes to the genitourinary system. A pregnant woman may experience an increase in the size of the kidneys and ureter due to the increase blood volume and vasculature. Later in

pregnancy, the woman might develop physiological hydronephrosis and hydroureter, which are normal. Progesterone causes vasodilatation and increased blood flow to the kidneys, and as a result glomerular filtration rate (GFR) commonly increases by 50%, returning to normal around 20 weeks postpartum. The increased GFR increases the excretion of protein, albumin, and glucose. The increased GFR leads to increased urinary output, which the woman may experience as increased urinary frequency. Progesterone also causes decreased motility of the ureters, which can lead to stasis of the urine and hence an increased risk of urinary tract infection.



Bibliography:

- Wikipedia
- www.researchgate.net