Chapter 22

Complications of Pregnancy

Embryonic Development

- 3 to 8 weeks after fertilization
- Organogenesis—formation of basic functional elements of organ systems
- Critical time in development of all organs and structures
- By end of 8 weeks, all organs are formed
- Exposure of the embryo to teratogens
  - Can cause serious congenital abnormalities

Teratogen

- Any substance or situation that causes a developmental abnormality
- Viruses
- Smoking or exposure of mother to second-hand smoke
  - Child with low birth weight
  - Increased irritability
  - Possible stillbirth

Teratogen (Cont.)

- Alcohol
  - Risk throughout pregnancy
  - Fetal Alcohol syndrome
    - Impairs child's neurological and intellectual development
- Radiation
- Certain medications, including herbal remedies

Pregnancy

- Laboratory diagnosis
  - Presence of human chorionic gonadotropin (hCG) in mother's plasma or urine
- Absolute signs
  - Later in pregnancy
  - Include heartbeat
    - By auscultation or ultrasound

Pregnancy

- Normal Gestation (38-42 weeks).
  - 3 trimesters (each approximatel 3 months long)
- Estimated date of confinement (EDC)
  - The due date, calculated from the last menstual period.
- Gestational age
  - Calculated from last menstual period - the “Menstrual Age”
  - In contrast, the actual or “fertilization age” is 2 weeks less than the “menstual age”
  - May be estimated (EGA) or measured (as in ultrasound)

Pregnancy (Cont.)

- Gravidity and parity
  - Woman's history of pregnancy and childbirth
  - Gravidity
    - Number of pregnancies
  - Primigravida
    - Pregnant for the first time
  - Parity
    - Number of pregnancies in which the fetus has reached viability (born live)
  - Multipara
    - Completed two or more pregnancies with viability

    G3P2 = three pregnancies, two live born

Pregnancy (Cont.)

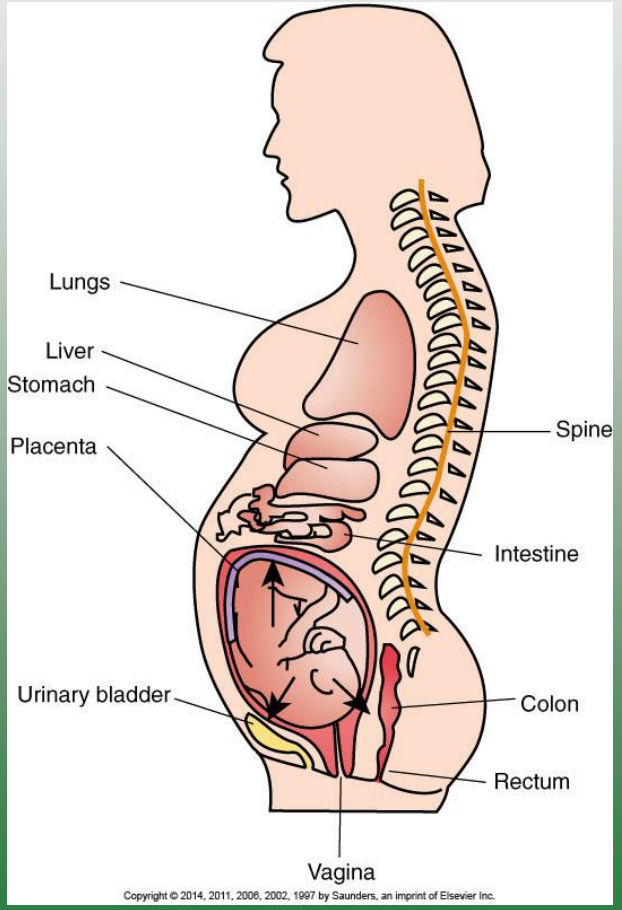
- Amniocentesis
  - Withdrawal of small amount of amniotic fluid
    - After 14 weeks
    - Fluid checked for chemical contents
    - Cells cultured for chromosome analysis
  - Chorionic villi sampling (CVS)
    - Alternative process
    - Earlier in pregnancy
    - Useful for chromosomal examination
    - Diagnosis in high-risk clients

Reproductive System Changes

- Increase in size of the uterus
  - Hypertrophy of muscle cells
- Increased vascularity of the cervix and vagina
  - Softening of the tissue
  - More abundant cervical mucus—cervical plug
    - Protection of uterine content
  - More acidic vaginal secretions
    - Deterrent to some infectious organisms
- Breasts enlarge
  - Increased glandular tissue

Sagittal Section of Pregnant Woman: Effects of Expanding Uterus

- Pressure of expanding uterus
  - Can interfere with digestive
  - function
  - Reduces vital capacity
  - Increases pressure on
  - bladder and rectum
  - Changes center of gravity



Weight Gain and Nutrition

- Average weight gain: 25-30 pounds (11-13 kg)
  - Increased size of uterus and contents
  - Enlarged breasts
  - Additional blood volume
- Increased demand for protein, carbohydrates, fat, vitamins, minerals
- Adequate calcium for bones and teeth
- Increased iron needs as maternal blood volume increases

Extra Weight

- Baby—~8 pounds
- Placenta—2-3 pounds
- Amniotic fluid—2-3 pounds
- Breast tissue—2-3 pounds
- Blood supply—4 pounds
- Stored fat for delivery and breastfeeding—5-9 pounds
- Larger uterus—2-5 pounds
- Total—25-35 pounds
- These numbers are the normal average figures.

Digestive System Changes

- Nausea and vomiting
  - Common in first trimester
    - Not just in the morning
  - Change in eating pattern often reduces discomfort
- Decreased motility in the digestive tract
  - Relaxation of smooth muscle by progesterone
  - Slower emptying of the stomach
    - Reflux of stomach contents (heartburn)
    - Constipation

Musculoskeletal Changes

- Marked postural changes
  - Pelvic joints relax or loosen
    - Hormones prepare for delivery
    - Loss of stability—waddling gait
  - Increased abdominal weight
    - Tendency toward lordosis
    - Balance and coordination may be impaired.
  - Backache caused by these changes

Cardiovascular Changes

- Increased blood volume
  - Both fluid and erythrocytes
  - Increased production of red blood cells for fetus
    - Requires increased iron intake by the mother
- Heart rate may increase slightly
- Blood pressure
  - Frequently drops slightly in first two trimesters
  - Rises to normal levels in last trimester
- Varicose veins
  - Frequently develop during pregnancy

Ectopic Pregnancy

- Tubal pregnancy
- Zygote is implanted outside the uterus
  - Usually in the fallopian tubes
- Spontaneous abortion may follow.
- Embryo may continue to develop.
  - Eventually causes tubal rupture
  - Severe hemorrhage leading to shock
  - Death
  - Considered a surgical emergency

Pregnancy-Induced Hypertension

- Persistently elevated blood pressure
  - >140/90 mm Hg
  - Develops after 20 weeks of gestation
  - May lead to stroke or damage to retina
  - Returns to normal after delivery

Pregnancy-Induced Hypertension (Cont.)

- Pre-eclampsia
  - Progressively higher BP
  - Kidney dysfunction, weight gain, generalized edema
  - Complication—HELLP syndrome (***h***emolysis, ***e***levated ***l***iver enzymes, ***l***ow ***p***latelets)
- Eclampsia
  - Extremely high blood pressure—seizures or coma
  - High risk of stroke
  - May require cesarean section delivery to reduce maternal risk

Gestational Diabetes Mellitus

- Develops in 2% to 5% of women
- May lead to developmental abnormalities if blood glucose level is high in first trimester
- Newborn is large for gestational age and may experience hypoglycemia after birth
- Glucose levels should be closely monitored in:
  - Women with family history of diabetes
  - Previously high-birth-weight infants

Gestational Diabetes Mellitus (Cont.)

- Dietary management
- Appropriate exercise program
- Insulin may be necessary to reduce the blood glucose level.
  - Oral hypoglycemics are teratogenic and are not used.

Placental Problems

- Placenta previa
  - Placenta is implanted in the lower uterus or over cervical os
  - Placenta may tear at end of pregnancy
  - Bright red bleeding—painless

Placental Problems (Cont.)

- Abruptio placentae
  - May occur following motor vehicle accident or spontaneously
  - Premature separation of the placenta from the uterine wall, usually causing bleeding
  - Blood may be trapped between placenta and uterine wall
  - Abdominal pain is common.

Blood-Clotting Problems

- Thromboembolism
  - Blood clots, common after childbirth
  - Usually develop in veins of legs or pelvis
- Thrombophlebitis
  - Clot forms over an inflamed area in the vein wall
- Embolus
  - If a piece of the thrombus breaks away:
    - Will flow with venous blood
    - May result in a pulmonary embolus

Blood-Clotting Problems (Cont.)

- Disseminated intravascular coagulation
  - Serious complication of other conditions
    - Examples :abruptio placentae, pre-eclampsia
  - Increased activation of clotting mechanisms
    - Results in multiple blood clots throughout circulation
  - Diagnosis confirmed by low serum levels of clotting factors
  - Hemorrhage, shock, and tissue ischemia

Rh Incompatibility

- Results when the mother is Rh-negative and the fetus is Rh-positive
- Usually not a problem during first pregnancy
- Rh-positive blood enters maternal circulation because of placental tears.
- Formation of maternal antibodies to Rh-positive blood
- Subsequent pregnancies—maternal antibodies destroy red blood cells.

Rh Incompatibility (Cont.)

- Hemolysis of red blood cells
  - Severe anemia, low hemoglobin
  - Jaundice may be severe.
  - Possible heart failure and death
- Early delivery or intrauterine transfusion may be recommended.
- Exchange transfusion after birth may be required.

Rh Incompatibility (Cont.)

- Prevention
  - Prenatal blood testing of woman and, if Rh-negative, of her partner
  - Monitoring for Rh antibodies in maternal blood
  - Administration of Rh antibodies within 48 hours of delivery or termination of pregnancy to neutralize Rh-positive cells in maternal blood—thus, no immunological memory to Rh-positive cells

Maternal Infection

- The healing uterus and perineal tissues are vulnerable to infection during the postpartum period.
- May lead to septic shock or peritonitis if untreated
- Increased risk of infection:
  - Retained placenta
  - Inadequate hygiene
  - Abortion in nonsterile conditions

Adolescent Pregnancy

- Teenagers have increased nutritional needs to meet demands of their own growth.
- Pregnancy at this time has increased risk of complications.
- Anemia is a common problem.
- Babies born to adolescent mothers frequently weigh less than normal or are preterm.
- Labor and delivery difficult—immature pelvis
- Pregnancy-induced hypertension is common.