Unit 11: Maternal Morbidity

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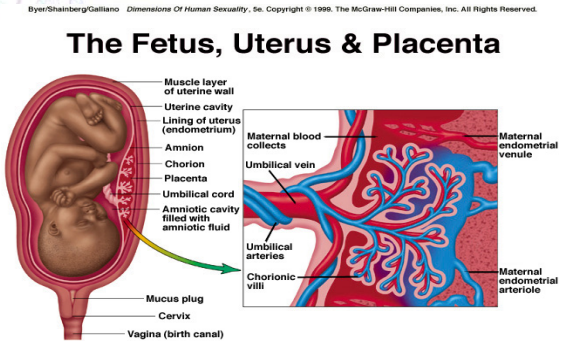
Learning Objectives

Upon completion of this unit, you will be able to:

- Describe and discuss the descriptive epidemiology of maternal morbidity
- Identify, describe and discuss the risk factors for maternal morbidity
- Describe and discuss the epidemiology of specific syndromes during pregnancy
- Describe and discuss the epidemiology of complications during labor and delivery
- Identify and discuss important methodological issues related to the conduct of epidemiologic studies on maternal morbidity in the United States

PHYSICAL/PHYSIOLOGICAL CHANGES DURING PREGNANCY

Anatomy of the Fetal-Placental Unit



Changes in Pregnancy

The reproductive system:

- Uterus – enlarges from 2 oz and a capacity of 2 ml to 2 lbs and a 2000x increase in capacity
- Cervix – softening at 6 weeks, thick mucus plug formed, increased vaginal secretions
- Ovaries and tube – increased blood supply, no follicles mature or ovulate during pregnancy
- Vagina – thickening of wall, reduction of connective tissue and increased growth of muscle tissue
- Breasts – tenderness, enlargement, and increased pigmentation,

Changes in Pregnancy

The Digestive System

- Excessive salivation, heartburn, decreased muscle tone in the large intestine

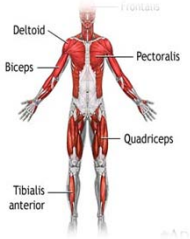
The Cardio-respiratory System

- Cardiac output increases by 25-50%
- Blood volume may increase by 40 – 90%
- Heart rate increases
- Appearance of varicose veins
- Dyspnea

Changes in Pregnancy

The Excretory System
- Frequency in urination
- Generalized edema

The Musculoskeletal System
- Softening of ligaments
- Relaxation of joints
- Postural changes
- Muscle spasms
- Paresthesia



Changes in Pregnancy

The Immune System (Immunogenic changes):
- Alterations in host response secondary to immunogenicity of conceptus:
- Immune hyporesponsiveness
- Fetoplacental unit escapes rejection due to
  - Uterus is an immunologically privileged site
  - Maternal immune system is altered
  - Placenta is an immunologic barrier

Defining Maternal Morbidity

- Condition that is directly cause by pregnancy, regardless of whether it manifests during or after pregnancy termination; or
- Condition that existed before pregnancy, but is exacerbated by pregnancy; or
- Condition whose causal relationship to pregnancy is undetermined

"Near-miss" morbidity

- Defined as "acute conditions related to pregnancy that, if untreated or inadequately treated, could result in death".
- "any departure, subjective or objective from a state of physiologic or psychological well-being".
- Onset can occur during pregnancy and delivery or an unlimited time after pregnancy termination
- May be resolved or result in long-term disability

"Near-miss" morbidity

- For morbidities that occur during pregnancy
  - The length of gestation at the time of onset is an indication of the severity of the disease
    - Earlier onset → more severe disease
  - Severe "near-miss" morbidity is an important measure and used as a sentinel for maternal morbidity
- Really a misnomer because it refers to mortality instead of morbidity

"Near-miss" morbidity

- Includes:
  - Conditions related to pregnancy that if untreated or inadequately treated could result in death;
- There is no standard, widely accepted definition
  - Consists of a combination of diseases, morbid events and procedures

Causes of "near-miss" Morbidity

- Uterine atony,
- sepsis,
- severe hypotension,
- uterine rupture,
- placenta accreta,
- pulmonary edema, and
- hypertensive disease

Measures of Occurrence

- Maternal morbidity risk
  - Used when an entire population is followed over time (cohort)
  - Proportion of pregnancies complicated by the morbidity
  - Unit of observation is "pregnancy" not the woman
- Maternal morbidity rate
  - Incidence rate = # events/# weeks (or months) of person time

Data Sources

- Medical examination
- Medical record abstraction
- Electronic clinic or administrative databases
- Pharmacy & laboratory data
- Surveys of hospitals or women
- Fetal death certificates
- Birth or death certificates
- Refer to table 3.2 in textbook for detailed information (pps. 52-54)

Healthy People 2020 Objective

Objective	Reduce Maternal Morbidity	2007 Baseline	2020 Target
MICH-6	Reduce maternal illness and complications due to pregnancy (complications during hospitalized labor and delivery)	31.1 %	28.0%
MICH-7	Reduce cesarean births among low-risk (full-term, singleton, and vertex presentation) women		
MICH-7.1	Reduce cesarean births among low-risk women with no prior cesarean births	26.5%	23.9%
MICH-7.2	Reduce cesarean births among low-risk women giving birth with a prior cesarean birth	90.8%	81.7%

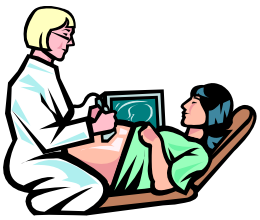
http://www.healthypeople.gov/2020/topicsobjectives2020/default.aspx

Maternal Morbidity

- In 1998: 31.2 complications occurred during every 100 hospitalizations for L&D
- In 2001: 31.8/100
  - African-Americans: 39.0/100 deliveries
  - Whites: 30.0/100 deliveries

Complications of pregnancy

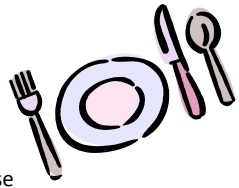
Play video about Common Pregnancy Complications



ANTEPARTUM CONDITIONS

Dietary Issues During Pregnancy

- Illness that inhibits nutrient absorption:
  - Nausea and vomiting
  - Pica
  - Lactose intolerance
  - Constipation
  - High sodium intake
  - High caffeine intake
  - Alcohol/substance abuse
  - Inappropriate weight gain



Pica

- "The craving for and consumption of unusual nonfood substances such as chalk, clay, ice, laundry starch, or cigarette butts."
- Consequences:
  - Consumption of empty calories
  - Constipation
  - Anemia
  - Parasitic infection

Kolasa KM and Weismiller DG. Nutrition during pregnancy. American Family Physician. 1997; 56(1):205-212.

Other Dangers

- Alcohol
  - Excessive or binge drinking is associated with fetal alcohol syndrome.
  - Alcohol drinking should be avoided throughout the pregnancy to prevent potential negative effects on the fetus
- Caffeine
  - The effects of caffeine consumption are mixed and inconsistent

Kolasa KM and Weismiller DG. Nutrition during pregnancy. American Family Physician. 1997; 56(1):205-212.

Morning Sickness

- Experienced by 50-80% of pregnant women
- Onset usually occurs 4-8 weeks; abates >20 wks
- Characterized by nausea and vomiting
- Can be precipitated by various stimuli, olfactory, visual; associated with hunger pains

Morning Sickness

- Exact pathophysiology is unknown
- Various theories have implicated:
  - High levels of HCG
  - High levels of circulating estrogens
  - Reduced stomach acidity
  - Lowered tone and motility of the digestive tract
- Relief by trial & error with hot tea, crackers, candy drops, smaller meals

Hyperemesis Gravidarum

- Intractable nausea and vomiting
- May be due to deep-rooted psychological factors resulting in a subconscious rejection of the pregnancy
- Complications include dehydration and acid-base balance disturbances
- Requires hospitalization for intravenous feeding (reduction of stimuli)
- Bendectin (Vitamin B_6 and doxylamine)

Hyperemesis Gravidarum

- Can cause:
  - Dehydration
  - Electrolyte imbalance
  - A greater than 5% weight loss
  - Ketonuria
  - Acidosis/Alkalosis

Factors Affecting Occurrence

Lower rate:

- Women who smoke
- Women who take multivitamins earlier in pregnancy
- Aged >30 years

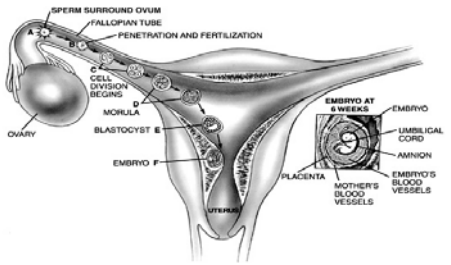
Higher Rate:

- Multiparous women
- Women with thyroid disorders
- Psychiatric illnesses
- Previous molar pregnancy
- Preconception diabetes
- Gastrointestinal disorders
- Asthma
- Multiple gestation
- Female fetus

ECTOPIC PREGNANCY

Normal Pregnancy

Blastocyst Implantation



Ectopic Pregnancy

- Approximately 2% of pregnancies are ectopic
- Accounts for 4 to 8% of pregnancy related mortality
- 75% of pregnancies occurring after a BTL failure are likely to be ectopic
- Only ½ of women who had ectopic pregnancy eventually deliver a live born infant and 25% suffer a repeat ectopic pregnancy

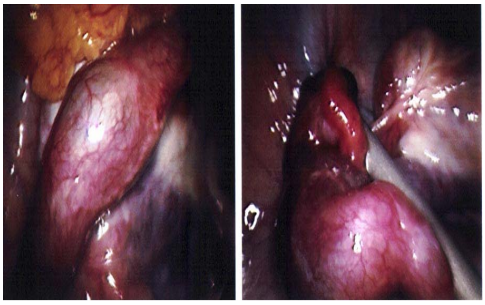
Risk Factors: Ectopic Pregnancies

- Cigarette smoking
- Tubal ligation
- Current or past use of IUD
- Vaginal douching
- Ovulation induction
- Congenital malformations of fallopian tubes
- History of PID
- Chlamydia infection
- Interrupted pregnancies or pelvic surgery

Ectopic Pregnancy

- Increased trend in ectopic pregnancies probably due to:
  - Greater prevalence of STI's
  - More adequate treatment of pelvic inflammatory disease
  - Use of the intrauterine device
  - Increase in surgical procedures for the treatment of fallopian tube disease
  - A greater number of elective sterilizations

Ectopic Pregnancy



Ectopic Pregnancy