Educational Topic 17: Medical and Surgical Complications of Pregnancy

Rationale: Medical and surgical conditions may alter the course of pregnancy. Likewise, pregnancy may have an impact on the management of these conditions.

Intended Learning Outcomes:

A student should be able to:

Identify the following medical and surgical conditions in pregnancy and discuss the potential impact of the conditions on the gravid patient and the fetus/newborn, as well as the impact of pregnancy (if any) on each condition, and appropriate initial evaluation:

- Anemia
- Endocrine disorders, including diabetes mellitus and thyroid disease
- Cardiovascular disease
- Hypertension
- Pulmonary disease
- Renal disease
- Gastrointestinal disease
- Neurologic disease
- Autoimmune disorders
- Alcohol, tobacco, and substance abuse
- Surgical abdomen
- Infectious diseases, including:
  - Syphilis
  - TORCH (Toxoplasmosis, Rubella, Cytomegalovirus, Herpes)
  - Group B Streptococcus
  - Hepatitis
  - Human Immunodeficiency Virus (HIV)
  - Human Papilomavirus (HPV) and other sexually transmitted infections
  - Parvovirus
  - Varicella
CASE 1: A 22-year-old female presents to the emergency department with a 3 hour history of steadily increasing lower abdominal pain. She has not seen a physician in over 3 years. She has no history of medical or surgical problems and takes no medications. She noted the pain shortly after eating lunch, and has had some nausea, but no vomiting. She denies fever, dysuria, flank pain, and vaginal bleeding. She does not remember her last menstrual period, because they are very irregular. She is sexually active, and does not use contraception regularly. She was treated for a “pelvic infection” with an injection one year ago, but she cannot recall the name of the infection. She denies use of illicit drugs, but admits to alcohol abuse (one 6-pack daily and more on the weekend) and gives a 6-year history of tobacco use. She describes the pain as a gradual onset, becoming sharp and intermittent with waves of pain alternating with short episodes of relief. An antacid did not give relief.

Physical examination reveals an anxious female lying on the exam table with hips flexed, moaning softly. She intermittently cries and complains of increasing pain. The nurse tells you her temperature is 99°F, and her pregnancy test is positive. Your examination of her abdomen reveals a gravid uterus to the level of the umbilicus with guarding and mild rebound tenderness in both upper quadrants. The uterus is soft and non-tender to palpation. Pelvic examination reveals no amniotic fluid in the vagina, and cervix is closed with no blood visible at the external os.

COMPETENCY-BASED DISCUSSION & KEY TEACHING POINTS:
Competencies addressed:
- Patient care
- Medical knowledge
- Professionalism

1. What tests/labs should be ordered at this time?
   - Urinalysis reveals 2+ glucosuria with infrequent WBCs and bacteria
   - CBC reveals a WBC of 14,000 with no left shift
   - Ultrasound reveals an intrauterine pregnancy with estimated gestational age of 22 weeks
   - Amniotic fluid volume appears normal

2. What is your initial assessment and plan?
   - Differential diagnosis may include:
     - Preterm labor
     - Chorioamnionitis
     - Constipation/Obstipation
     - Appendicitis
     - Pyelonephritis
     - Nephrolithiasis
     - Ovarian torsion
• Gastroenteritis

• This patient has multiple potential causes of her pain. She should be evaluated for both pregnancy-related and non-pregnancy related sources of her pain. The multitude of possible causes frequently results in the need for consultation jointly by the obstetrician and surgeon, and when surgery is indicated, both may need to be present in the OR until the etiology has been determined.

3. What potential impact will the medical or surgical condition have on the patient and the fetus/newborn, and what potential impact will the pregnancy have on the medical or surgical condition?

• Medical and surgical conditions may present differently during pregnancy due to the anatomic and physiologic changes of pregnancy. Specifically, the physical finding of maximal tenderness in appendicitis (McBurney's point) will rise out of the right pelvis upward in pregnancy as gestational age increases.
• Known pregnancy may impact the type of evaluation done for medical and surgical diseases. Specifically, the evaluation for appendicitis in pregnancy should lead to MRI instead of CT if abdominal ultrasound for appendicitis is non-diagnostic.
• Pregnancy may impact the course and prognosis of certain medical and surgical diagnoses, thus dictating a more aggressive management plan to avoid more serious maternal and fetal morbidity, and onset of preterm labor.
• The physiological changes that normally occur during pregnancy MUST be considered when evaluating a gravida with a medical or surgical problem to determine when clinical or laboratory findings are a normal change of pregnancy and when they are indicative of disease.
• Consultation with an internist or surgeon is frequently indicated when complicated medical or surgical situations occur during pregnancy.

CASE 2: A 30 year-old white female G0 who is infected with human immunodeficiency virus (HIV, diagnosed 4 years ago) presents to your office inquiring about future pregnancy. She is recently married to a man who is not infected with HIV and they want to have a child. She is concerned about whether her baby could be infected with HIV and whether pregnancy could make her develop AIDS. She is asymptomatic and is taking no HIV medications. Her pap smears have all been normal.

Pertinent ROS reveals she has felt well, no recent fevers, chills, cough, shortness of breath, abdominal pain, vaginal discharge, night sweats, diarrhea, weight loss, or other symptoms.

Physical examination is unremarkable.

Laboratory tests: CD4+ lymphocyte count (per mm3) 489; HIV RNA (copies/ml) 6520.

COMPETENCY-BASED DISCUSSION & KEY TEACHING POINTS:
Competencies addressed:
• Patient care
• Communication
• Medical knowledge
• Professionalism
1. What are the major issues to discuss with a woman who is HIV+ and wants to have a baby?

- Three major issues in this case:
  - Management of HIV in a pregnant woman (or, does pregnancy alter the course of HIV infection?).
    - Fortunately, pregnancy does not appear to accelerate the course of HIV infection. For the most part, pregnant women with HIV should be treated in the same manner as non-pregnant adults with HIV (exceptions discussed below).
  - Management of pregnancy in an HIV infected woman (or, what are the risks to the fetus and are there ways to prevent mother to child transmission [MTCT] of HIV?).
    - The major risk to the fetus is MTCT of HIV. In the absence of antiretroviral therapy, the MTCT rate for HIV is ~25%. With effective therapy, this rate can be reduced to 1% or less. Additional risk factors for MTCT of HIV are discussed below.
  - Safe sex practices (or, prevention of HIV infection for the HIV-negative partner in discordant couples).
    - Of course, abstinence or the regular use of condoms are the best methods of prevention. In this case, the risk of transmission to the uninfected husband during each act of unprotected intercourse would be low (but not eliminated) once the woman’s viral load becomes undetectable on therapy. However, in the event of desired pregnancy such as in this case, artificial insemination should be recommended.

2. What are some of the risk factors for MTCT of HIV?

- Maternal disease status: Low CD4+ T-cell count, High HIV viral load (>1000 copies/ml), AIDS (more advanced disease is associated with an increased rate of MTCT).
- Co-existing STIs (need to screen and treat).
- Drug abuse (need to screen and offer treatment).
- Labor-related factors: the majority of MTCT of HIV during pregnancy occurs at the time of labor and delivery; major risk factors during this time include: length of time membranes are ruptured (>4 hours associated with increased risk), chorioamnionitis (infection associated with increased risk), fetal scalp electrode (invasive monitoring associated with theoretically increased risk, for this reason avoidance of FSE is recommended), vaginal versus cesarean delivery (in the absence of antiretroviral therapy, in the presence of ZDV monotherapy, or in the presence of HIV viral load >1000 copies/ml, women should be offered planned C/S at 38 weeks GA prior to labor or ROM).

3. What are the recommendations for treatment of HIV in pregnant women? How may these differ from recommendations for non-pregnant adults?

- Current recommendations (November, 2014) for starting antiretroviral therapy in non-pregnant adults include a CD4+ T-cell count <200-350 and an HIV viral load >100,000. Therefore, for this patient in the non-pregnant state, we would not recommend starting antiretroviral therapy for her own health based on her laboratory values. However, we should recommend antiretroviral therapy to prevent transmission of HIV to her fetus.
The primary goal of antiretroviral therapy in pregnancy is to maximally suppress viral load by the time of delivery. Unfortunately, even in the presence of undetectable viral load on antiretroviral therapy, there is the possibility of transmission (i.e., there is no threshold viral load below which transmission does not occur). However, for any given viral load, the rate of transmission is lower among women on antiretroviral therapy compared to women not receiving therapy. Pregnant women with HIV should be treated with combination antiretroviral therapy (ZDV monotherapy is suboptimal). The choice of drugs should be made on the basis of clinical experience of individual agents in pregnancy, their known and suspected toxic effects on mother and fetus, pharmacokinetic data in pregnancy, long-term efficacy and patient’s concerns (see below).

Women may start on therapy prior to pregnancy (optimal) or at 14 weeks gestation (some women prefer to defer starting therapy until after the first trimester). Oral therapy should be continued in labor and delivery and, unless contraindicated for some reason, intravenous ZDV should be administered to the mother during labor or prior to elective C/S.

The neonate should receive oral antiretroviral therapy for up to six weeks (follow updated recommendations, coordinate care with pediatricians).

Are there any antiretroviral drugs that should be avoided or administered in altered doses in pregnant women with HIV?

The field of HIV is a rapidly advancing and the drug regimens available can be complicated with multiple possible side effects. These factors emphasize the need for consultation with a provider who is experienced in the care of HIV infected adults. There is a web site that is updated regularly where providers can access current guidelines as well as obtain assistance by phone and by e-mail (http://AIDSinfo.nih.gov).

Discussing all of the potential nuances of therapeutic options and concerns in pregnancy is beyond the scope of this case. However, selected examples follow: There are certain drugs that should be avoided or monitored differently in pregnancy:

- Teratogenic effects (efavirenz or Sustiva®)
- Potential maternal or neonatal mitochondrial toxicity (certain combinations of nucleoside reverse transcriptase inhibitors, NRTIs)
- Potential maternal hepatic toxicity (nevirapine or Viramune®)
- Increased risk for glucose intolerance (protease inhibitors)
- Altered pharmacokinetics (indinavir or Crixivan®)
REFERENCES


ACOG Practice Bulletins 20, 29, 30, 37, 60, 68, 78, 82, 86, 90, 95, 100, 105, 113.

ACOG Committee Opinions 279, 281, 284, 301, 411, 418, 422, 435, 438, 449.
