High Risk Pregnancies

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Conflicts of interest

- Grants
- Relationships with private industry
Learning Objectives

- Identify patients at high risk if they become pregnant
- Identify the first trimester patient who warrants referral to a specialist
- Identify common warning signs in the second trimester
- Understand common complications encountered in the third trimester
Pre-test Questions

Which patient has the highest risk for birth defects?

- A patient who has a previous child with Down’s Syndrome
- A patient with poorly controlled Type II diabetes
- A patient who had an abdominal CT in the first trimester
- A patient who started chemotherapy for breast cancer in the second trimester
A patient presents with increased discharge and pelvic pressure at 19 weeks of gestation. The most likely diagnosis is:

- Chlamydia Trachomatis infection
- Cervical insufficiency
- Inevitable Abortion
- Normal symptoms of pregnancy
An 18 year old patient presents at 34 weeks with new-onset high blood pressure and a severe headache. The most likely diagnosis is:

- Pre-eclampsia
- Chronic hypertension
- Methamphetamine use
- Hemorrhagic stroke
The patient at high risk in pregnancy
• Reproductive life spans from 12-50

  ◦ Extremes of age increase morbidity and mortality for women

  ◦ In any ovulatory cycle with unprotected intercourse there is a 40% chance of fertilization. About half of these zygotes will implant – 20% chance of pregnancy.

  ◦ 50% of pregnancies in the US are unintended
• Most high risk consultations occur only when the patient is already pregnant

• Women frequently don’t realize they are pregnant until 6-8 weeks of gestation

• Referral to high risk physicians can take weeks
Who is at risk in pregnancy?

- Underlying Cardiac Diseases
  - Atrial or ventricular shunts
    - ASD, VSD
  - Stenotic lesions limiting cardiac output
    - Coarctation of the aorta, aortic stenosis
  - Marfan syndrome
  - Pulmonary Hypertension
    - Related to or unrelated to a shunt
Diabetes

- Type I and Type II diabetics should have tight control before pregnancy
  - HbA1C recommended 5-6 at conception
  - HbA1C above 8.5 strongly associated with congenital defects (22% in one study)
  - Patients with comorbidities have higher fetal and maternal risks during pregnancy
Hypertension

- Risk for growth restriction

- Maternal risk for preeclampsia
  - Recommend optimal control before conception
  - Patients with renal insufficiency often have advancing disease with pregnancy
  - If pregnancy occurs, baseline and continued testing is important
    - 24 hour urine for protein excretion
    - Fetal growth assessment
Renal insufficiency

- GFR is increased in pregnancy
- Excretion of albumin increases during pregnancy
- Risk of hypertensive disorders of pregnancy, fetal loss and prematurity are increased
Thrombophilias

- History of clots
  - DVT, PE

- Known hereditary thrombophilia
  - Factor V leiden, Protein C/S, prothrombin gene mutations

- Acquired thrombophilia
  - Antiphospholipid antibody syndrome
Patients undergoing cancer treatment

- Pregnancy is not advised during chemotherapy or radiotherapy
- Radiation therapy can be given if needed with abdominal shielding
- If chemotherapy is required deferring until the 2nd or 3rd trimester is preferable
  - <2% chance of birth defects
  - IUGR with low birth weight and need for premature delivery remain a concern
  - Increased chance of fetal loss or malformation (16%) if given chemotherapy in the 1st trimester
Other endocrine disorders

- Poorly controlled thyroid disease
  - Maternal risk of preeclampsia
  - Fetal risk of growth restriction, cardiac failure, intellectual impairment

- Congenital Adrenal hyperplasia
  - Concern for virilization of the female fetus
Neurologic Conditions

- Untreated cerebral aneurysms
  - Risk of hemorrhagic stroke

- Multiple sclerosis
  - Most women do well during pregnancy
  - Increased risk of flare postpartum
• Other conditions

  ◦ HIV/AIDS

  ◦ Poorly controlled medical conditions
    • Anemia
    • Crohns, Ulcerative colitis
    • Schizophrenia, Bipolar Disorder, Depression and anxiety
• Most of these patients can embark on a pregnancy

• Counseling about risk is very important before pregnancy

• Optimization of health is frequently possible before conception
Contraceptive methods

- Long Acting Reversible Contraceptives (LARCs)
  - Lowest failure rates
  - Favorable side effect profile
  - Easily reversible
    - Mirena, Paragard, Nexplanon

- Many patients can receive estrogen-containing birth control methods
  - SLE patients without antiphospholipid antibody syndrome
  - Patients on anticoagulation
First trimester patients who should have additional assessment and care
The first trimester

- The first 14 weeks of pregnancy
- Patients with any of the discussed medical conditions should be optimally managed and referred for co-management with a high risk specialist.
Acute illness

- In early pregnancy an obstetrician should be involved in diagnosis and treatment of complicated patients

- If clinical suspicion is high, radiographic studies can be used

- The radiation doses used for an abdominal CT do not reach levels that have a strong association with birth defects

- Repeated CT scans in pregnancy should be avoided if possible because of the mildly increased risk of childhood leukemia in offspring
  - MRI and US are frequently preferred in pregnancy
  - No concern for induced birth defects
  - US frequently the better and faster modality in early pregnancy
Abnormal bleeding

- A patient presenting with bleeding and abdominal pain
  - Ectopic must be excluded
  - Ultrasound is essential
  - If an IUP is not seen, $\beta$HCG can be useful
  - Molar pregnancy must be excluded
  - Ultrasound findings of a ‘snowstorm’ or an abnormal fetus in combination with an abnormally elevated $\beta$HCG
Twins and more

- Establishing amnionicity / chorionicity early is important
  - Dichorionic / Diamniotic
    - Growth discordance
  - Monochorionic / Diamniotic
    - Twin-twin transfusion syndrome
    - Stillbirth of one twin risks the other
  - Monochorionic / Monoamniotic
    - Cord entanglement
    - Highest risk of stillbirth

- All twins are at an increased risk for
  - Prematurity
  - Pre-eclampsia
Abnormal screening

- Abnormal nuchal translucency
- Abnormal serum screening
- Abnormal free fetal DNA
Nuchal Translucency

- <3mm in isolation is normal
- <3mm in combination with abnormal serum markers may be screen positive.
Management of Abnormal Screening

- Consultation with a genetic counselor and obstetrician who can offer specialized diagnostic services recommended

- All patients should be offered genetic counseling
  - Those with a child with a chromosomal defect have twice the population risk of a recurrence
  - Some patients with an affected child will have a parent with a balanced translocation, this results in a greatly elevated risk of a recurrence
Obstetric history

• A delivery before 37 completed weeks of gestation

  ◦ Spontaneous
    • 17OHP
    • Cervical lengths
    • Cerclage

  ◦ Indicated
    • Aspirin
Obstetric history

- Previous stillborn infant
- 3 or more prior spontaneous abortions
- History of cesarean section
  - Low transverse
  - Classical, T or J incision
Second trimester warning signs and high risk diagnoses
Second trimester

- 14 – 26 weeks
- Screening window for a short cervix
- The routine anatomy ultrasound is generally performed between 18 and 22 weeks
The anatomy scan

- Placenta
  - Placenta Previa
    - Planning for preterm cesarean delivery
  - Placenta Accreta
    - Planning for preterm cesarean delivery
    - Cesarean hysterectomy preferred management
  - Vasa Previa
    - Ultrasound monitoring with cesarean delivery near term
• Symptoms of placenta previa are bleeding in the second or third trimester.

• Many patients will have no symptoms before a significant hemorrhage
Placental Assessment
Cervix

- Short cervix
  - Consideration of vaginal progesterone
  - Consideration of cerclage
• Symptoms of shortening / opening cervix
  ◦ Vaginal pressure
  ◦ Increased vaginal discharge
  ◦ Cramping
  ◦ Many patients have no symptoms
• Fetus

  ◦ Structural anomalies
    • 3% will have a structural difference
    • 1% will have a heart defect
    • The risk of structural defects goes up with certain factors such as family history, diabetes and some medications.
Third trimester complications
Third Trimester Complications

- Hypertensive disorders of pregnancy
  - Gestational Hypertension
  - Pre-eclampsia
  - Chronic hypertension with superimposed pre-eclampsia
  - Less commonly drug-induced hypertension or other rare causes of hypertension in young people (pheochromocytoma)
• Gestational hypertension
  ◦ New onset hypertension after 20 weeks
  ◦ 2 readings at least 4 hours apart
  ◦ No associated proteinuria (>300mg/24 hour collection, protein:creatinine ratio ≥0.3, 1+ protein on urine dipstick)
  ◦ No associated symptoms of pre-eclampsia
• Pre-eclampsia

  ◦ New onset hypertension after 20 weeks of gestation

  ◦ Proteinuria or
    • Unremitting headache
    • Epigastric or RUQ pain
    • Scotomata
    • Platelet count <100,000
    • Liver transaminases >2x normal values
    • Oliguria
Superimposed pre-eclampsia

- Worsening of hypertension after 20 weeks of gestation

- Signs or symptoms of pre-eclampsia
New onset hypertension at or beyond 37 weeks should generally be treated with induction of labor or cesarean

- If left untreated patients with gestational hypertension or preeclampsia are at risk for
  - Severe pre-eclampsia
  - Seizures
  - Malignant hypertension
  - Eclampsia
  - Hemorrhagic stroke

Patients with pre-existing hypertension should be delivered at 38-39 weeks
Growth Restriction

- Signs may be lagging fundal height or maternal complaint that the fetus feels ‘smaller’ than her last baby

- IUGR is growth achieved <10th percentile

- Doppler assessment of the umbilical arteries should be performed

- With abnormal umbilical artery dopplers, consideration should be given to delivery at a preterm gestational age because of the risk of stillbirth if pregnancy continues
Abdominal circumference
Umbilical Artery Doppler
Decreased Fetal Movement

- Antenatal testing should be instituted
  - Biophysical profile
  - Modified biophysical profile
  - Non-stress Test
  - Contraction stress test
Post-talk questions

- Which patient has the highest risk for birth defects?
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Questions?
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