Prenatal Care

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Prenatal Care - Introduction

- Prenatal care focuses on prevention
- Majority of pregnant gravidas will deliver without major complications
- Goal of prenatal care is to select gravidas at risk for development of major complications and early prevention/intervention in order to affect improved outcome

Gestational Age

- Outcome in pregnancy is gestational age dependant
- Calculation of gestational age is made using a variety of methods:
  - Patient history
  - Initial pelvic exam/biochemical test of pregnancy
  - Fetal heart auscultation (10-11 or 18-19 weeks)
  - Quickening (16-20 weeks)
  - Serial fundal height measurement (at umbilicus - 20 weeks)
  - Ultrasound estimation of gestational age
- Dating (U.S.) best based upon MENSTRUAL DATING (Last normal menstrual period to estimated date of confinement 40 7-day weeks)

Ultrasound Dating

- Ultrasound dating less accurate as gestational age advances
- Early pregnancy - Crown Rump Length (CRL): CRL + 6.5 approximates gestational age (±7 days)
- Mid pregnancy (12-28 weeks) - correlation between ultrasound and menstrual dating is ±10-14 days
- In late pregnancy, ultrasound accuracy as single estimate of gestational age is not great (±21 days)

Physical Exam - Fundal Height

- **Fundal Height evaluation is reasonable estimate of gestational age**
- **After 20 weeks gestation:**
  - **Gestational age in menstrual weeks roughly equivalent to centimeters from superior aspect of symphysis pubis to fundal portion of uterus**
  - **Inter-observer differences exist**
  - **Circumstances may alter measurement:**
    - **Multiple gestation**
    - **Oligohydramnios/Polyhydramnios**
    - **Uterine pathology**

Antenatal Testing

- **High-risk pregnancies at risk for fetal loss receive antenatal testing at least once per week:**
  - **Nonstress testing**
  - **Contraction stress testing**
  - **Biophysical profile testing**

Fetal Movement Testing

- Fetal movement positively associated with fetal well-being and negatively associated with intrauterine fetal demise
- Average fetal movement varies with gestational age
- Maternal perception of fetal movement varies
  - In late pregnancy force of fetal movement is less than earlier in gestation
  - Quickening first felt at 16-20 weeks

Laboratory Tests - Prenatal Care

- Hemoglobin/Hematocrit
- Urinalysis/Urine Culture/Urine Dipstick
- Glucose testing
- Blood Type/Rh
- Serologic test for Syphilis
- N. Gonorrhea/Chlamydia
- Other tests

Hemoglobin/Hematocrit (H/H)

- Normally red-cell mass increases in pregnancy and plasma volume increases (even more)
- Result of expansion is a measured decrease in hemoglobin/hematocrit - nadir of H/H at approx 28 weeks
- In U.S., H/H tested early in pregnancy, at 28 weeks and at or near term
- Anemia can be a screen for:
  - Maternal disease
  - Hemoglobinopathy
  - Anemia (Iron deficiency; Folate; B12)

Urinalysis/Culture/Dipstick

- In U.S., urinalysis and dipstick generally done at intake (culture optional)
- Dipstick for Proteinuria
  - Done each visit
  - If +, may indicate renal disease, preeclampsia, or infection
- Dipstick for glucose - not reliable association with serum glucose
- Cystitis and Pyelonephritis much more common in pregnancy - use low threshold for diagnosis

Blood Type/RH

- In U.S., Rh-negative blood is approximately 10%-20%
- Typing done in case blood later needed
- Indirect antibody testing for antibodies to red cell antigens performed
- If fetus is at risk for disease, level of monitoring is increased

Infectious Disease Testing

- In U.S., Gonorrhea, Syphilis, and Chlamydial cervical cultures obtained
- In U.S., most areas screen for HIV
  - Immunoprophylaxis in labor and treatment antepartum lowers perinatal transmission
- Lancefield Group B Streptococcus may be cultured or empirically treated in labor if in a high-risk group (preterm, prior infant with disease, prolonged ruptured membrane, etc.)

Glucose Testing

- Gestational diabetes (U.S.) incidence is approximately 5% of pregnant population
- Diabetes screen (28 weeks gestation)
  - 1-hr post 50 gram glucose load by mouth
  - Diabetes suspected if >140 mg%
- Glucose tolerance test diagnostic
  - 100 gram glucose load with fasting, 1 hr, 2 hr, and 3 hr serum glucose
  - Any two values abnormal diagnostic (<105; >190; >165; >145 mg%, respectively)
- Fasting and 2 hr postprandial may be alternative
- Macrosomia is risk factor

Visit Interval - Pregnancy (Uncomplicated Patient)

- Conception until 26-28 weeks gestational age - Every 4 weeks (Pelvic exam on first visit)
- 28-36 weeks gestational age - Every 2 weeks
- 36-40 weeks gestation - Every week (Pelvic exam at least by term)
- High risk pregnancy may alter visit intervals
- Preterm labor risk may alter pelvic exam interval
- Post dates pregnancy - Consider evaluation for antenatal testing (Nonstress testing)

Other Testing

- Serum marker screening (Maternal serum alphafetoprotein, human chorionic gonadotropin, and estriol) usually offered in U.S. to patients 15-21 weeks
- Patients at risk for fetal aneuploidy may receive invasive prenatal diagnosis (such as amniocentesis)
- In U.S., prenatal Rubella immunity testing performed

Symptoms to Evaluate During Pregnancy

- Bleeding
- Decreased fetal movement
- Swelling
- Headache
- Visual disturbance
- Contractions
- Leakage of fluid

Bleeding in Pregnancy

- **Etiology of bleeding is influenced by gestational age**
- **Early pregnancy bleeding is more important if associated with pelvic pain (Threatened abortion?)**
- **Late pregnancy bleeding differential diagnosis:**
  - **Abruptio placenta**
  - **Placenta previa**
  - **Cervicitis**
  - **Labor**
  - **Vasa previa**

Swelling (Edema)

- Edema is relatively common in pregnancy (80%+ in warm climates or high salt consumption)
- Pathologic edema may be associated with preeclampsia:
  - >4 lb weight gain in one week
  - Sudden swelling of hands or face
  - Presence of other symptoms associated with preeclampsia

Decreased Fetal Movement

- Decreased fetal movement may be lack of maternal perception of fetal movement
- Intrauterine fetal compromise may be preceded by decreased fetal movement
- Probably a wise idea to address maternal perception of decreased fetal movement

Headache/Visual Disturbance

- **Headache and visual disturbance (double vision, photophobia, etc.) may be:**
  - **Preeclampsia**
  - **Migraine/Cluster headache**
  - **Other neurological conditions**
  - **Isolated event**
- **Careful history may elucidate “normal” causes from “abnormal causes”**
- **Headache/visual disturbance with hypertension should be considered preeclampsia until proven otherwise**

Leakage of Fluid ("ROM")

- Pregnancy normally associated with increased amount of vaginal discharge
- Warning signs for discharges:
  - Watery discharge = possible ROM
  - Green discharge = possible meconium
  - Itching discharge = possible vaginitis
  - Bloody discharge = cervicitis or serious causes of vaginal bleeding

Leakage of Fluid ("ROM") (2)

- If ruptured membranes suspected, sterile speculum exam can evaluate:
  - pH: Amniotic fluid typically with alkaline pH (>7.0)
  - Pooling or direct leakage: Fluid will directly leak out of cervix during Valsalva
  - Fetal ferning: Classic ferning pattern under microscopic visualization

Leakage of Fluid ("ROM") (3)

- Prolonged rupture of amniotic membranes (>24 hours) associated with increase in intrauterine infection
- Preterm rupture of amniotic membranes associated with preterm labor and infection
- Term ROM associated with spontaneous labor in over 90% of patients

Contractions

- Uterine contractions occur throughout pregnancy (4/hour in early third trimester)
- Frequency of contractions increases just prior to the onset of perceived labor
- Persistent contractions of closer than 15 minutes apart that do not resolve with simple bedrest or fluids need some sort of evaluation
- Cystitis often associated with uterine irritability
- Multiple pregnancy and polyhydramnios also associated with irritability

Weight Gain in Pregnancy

- At term, approximate weight of blood volume expansion, fetus, uterus, and edema generally equals approximately 7 kg
- Weight gain of 200-500 gm per week is advocated
- Many suggest an additional weight at term to account for breast feeding fat reserve - total of approximately 10 kg recommended
- Excessive weight gain over 20-25 kg may increase risk of gestational diabetes and other complications

Blood Pressure

- Blood pressure normally decreases to a nadir at mid-pregnancy
- Blood pressure then rises to early pregnancy levels by term
- Blood pressure should be taken in the right or left arm while the subject is sitting
- A large degree of blood pressure variation exists between sitting, in the lateral recumbent position, or supine position during late pregnancy

Nutrition in Pregnancy

- **On average, an additional 300 Kcal intake is recommended during pregnancy**
- **An additional 5-6 gm/day of protein needed**
- **Calcium**:
  - **Although optimal for women in general, only about 30 gm of calcium (2.5% of total stores) is scavenged by the fetus**
- **Folate**:
  - **A minimum of 0.4 mg folate will reduce the rate of open neural tube defects**

Nutrition - Iron (Fe)

- 300 mg of Fe transferred to fetus during pregnancy
- 500 mg of Fe used to expand maternal blood volume
- Women usually are at an Fe deficit:
  - Minimal recommendation is 15 mg Fe/day
  - If depleted, 30-60 mg more reasonable
  - Multiple gestation or anemia may require up to 200 mg/day

Alcohol/Tobacco

- **Smoking effects:**
  - **Lower birthweight/growth restriction**
  - **Placental abruption**
  - **Placenta previa**
- **Alcohol effects:**
  - **Birth defects**
  - **Behavior disorder**
  - **Placental abruption**
- **Summary - Do not drink or smoke while pregnant**

Common Complaints/Issues in Pregnancy

- Constipation
- Morning sickness (Nausea and vomiting during pregnancy)
- Heartburn
- Hemorrhoids
- Backache

Constipation

- Caused by motility effects of progesterone and direct mass-effect of gravid uterus
- Treatment generally should be via dietary modification:
  - Increased fluids
  - Increased bulk
- Mild laxatives or stool softeners may be reasonable

Morning Sickness

- Nausea typically occurs between 6-12 menstrual weeks - some patients have symptoms longer
- Dietary modifications:
  - Frequent small meals
- Anti-emetics may be needed:
  - Antihistamines
  - Phenothiazine
- Acupressure may help
- Rare refractory cases may require hospitalization, nutrition, etc.

Heartburn

- Reflux esophagitis is more frequent during pregnancy
- Dietary treatment:
  - Limit spicy foods
  - Limit eating prior to reclining
- Medications:
  - Antacids
  - H2 antagonists
- Lifestyle treatment:
  - Bed elevation

Hemorrhoids

- Constipation worsens preexisting hemorrhoids
- Stool softeners and/or treatment of constipation probably helpful
- Local measures may help

Backache

- Posture in pregnancy is lordotic
- Back strain is common
- Treatment of back strain is problematic:
  - Aspirin and NSAID's not recommended
- Best advice is prevention (good lifting mechanics)
- Bedrest, massage, heat, and non-aspirin analgesia as treatment for pain

Conclusion

- **Prenatal care is preventive and supportive in nature**
- **Through cooperation between the pregnant patient and her care provider, complications can be monitored**