Early Pregnancy
Is it normal or not?

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Objectives

- Describe the events from conception to implantation
- Describe the hormonal support for early pregnancy
- Describe the differential diagnosis for first trimester bleeding
- Understand the role of ultrasound in diagnosing early pregnancy
- Understand the role of serial hCG levels in diagnosing early pregnancy
- Describe how to distinguish ectopic pregnancy from SAB

Thie First 5 Weeks: Conceptus Stage of Pregnancy

- Conception about day 14
- Implantation of blastocyst day 21-23
- Syncyciotrophoblast invades surrounding tissue, makes hCG, forms early placenta day 23-30
- Yolk sac, amniotic sac and fetal pole form day 35
- Fetal cardiac motion 6 weeks- hCG=6000
- Most ectopic pregnancies are diagnosed by 7 weeks

Corpus luteum

- Secretes progesterone following ovulation
- Continues to secrete progesterone in the presence of HCG, until about 10 weeks
- After 10 weeks, progesterone is made by the placenta and the CL atrophies
- Between week 7-10, both placenta and corpus luteum synthesize progesterone

Progesterone

- Essential for maintaining early pregnancy
- Level of less than 5 ng/ml suggests inevitable abortion
- Level greater than 25 ng/ml suggests healthy placenta

hCG

- Secreted by the syncytiotrophoblast
- First detectable 9-10 days after conception
- Replaces LH as hormonal support the for corpus luteum

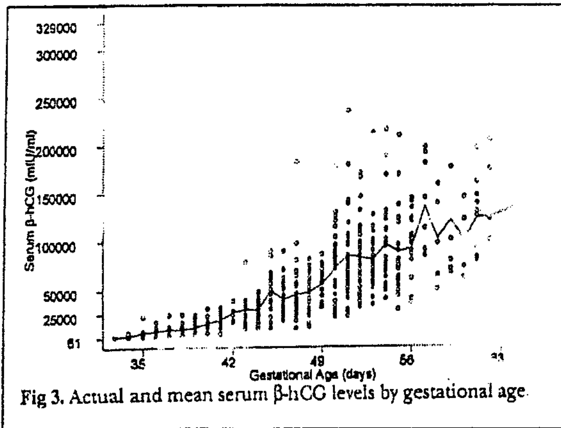


Fig 3. Actual and mean serum β-hCG levels by gestational age.

HCG Doubling Times

- Doubles every 1.4-1.5 days up to 6-7 weeks
- Double every 3.3 days thereafter until about 9-10 weeks
- Peaks at 50,000-100,000 at about 10 weeks
- Tends to decline slightly after 10 weeks
- ranges 10,000-20,000 at 20 weeks
- Elimination half-life biphasic-initially 5-9 hours, then 22-32 hours at low levels

Ultrasound

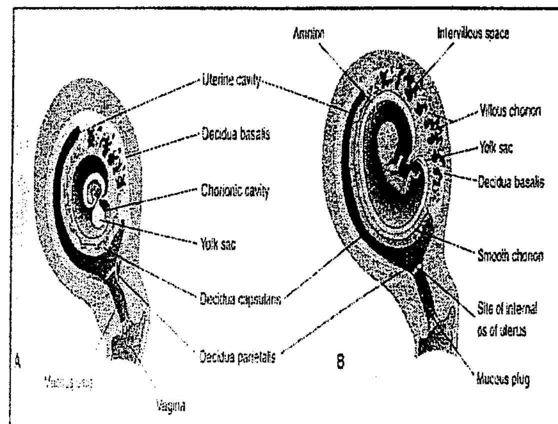
- Useful for diagnosing intra-uterine pregnancy
- discriminatory HCG level 1500-2000
  - may misdiagnose up to 15% nl IUP
- Adnexal mass: ectopic or corpus luteum?
  - 15-30% of ectopics have no mass on u/s
- Heterotopic pregnancy- 1:30,000 or 2:100?

Early Pregnancy Growth

- Sac should grow .8mm per day
- At 13mm a yolk sac should be seen

Double Decidual Sign

- Sac 5-13mm
- echogenic ring of chorion
- small amount of fluid
- echogenic ring of decidua vera



First trimester bleeding

- Ectopic pregnancy
- threatened SAB
- inevitable SAB
- molar pregnancy
- cervicitis
- implantation bleeding

SAB 1

- 15-20% of recognized pregnancies end in SAB
- Using hCG measurements to detect very early pregnancy, twice a many pregnancies end in SAB
- Approximately 50% of early losses are due to genetic problems

SAB 2

- The rate of SAB drops to 4-6% once a fetal heartbeat is seen
- The rate drops to 1-2% after the first trimester

Non-genetic etiology of SAB

- uterine malformations - implantation on a septum or small horn
- ? luteal phase defects
- anti-cardiolipin antibodies
- diabetes
- often there is no known etiology

Management of SAB

- Expectant
  - 10% will need D&C for excessive bleeding
  - Very small risk of DIC
  - Less risk of infection than with D&C
- D&C
- Misopristil 400mcg intravaginally
- Give rhogam if rH negative

SAB Terminology

- **Inevitable SAB**
  - **Demonstable fetal demise or anembryonic gestation**
  - **If no bleeding, called missed SAB**
- **Threatened SAB**
  - **Bleeding with normal appearing IUP**
- **Incomplete SAB**
  - **Bleeding with no apparent IUP (sac ruptured but remaining tissue in uterus)**

Molar pregnancy

- placental tissue with paternal chromosomes only (incomplete are triploid)
- symptoms include vaginal bleeding, hyperemesis, size unequal to dates
- snowstorm pattern on ultrasound
- potentially invasive

Ectopic Pregnancy

- Up to 2% of pregnancies
- Increasing rate is due to:
  - Early diagnosis
  - Over diagnosis of SAB
  - Reproductive technology
  - Conservative management creating more risk of tubal pregnancy
- Fewer rupture now than 20 years ago

Major Risks for Ectopic Pregnancy

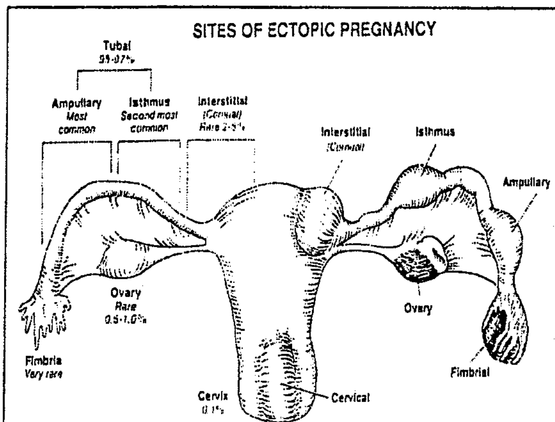
Fertil Steril 1997 67(4):791-2

- history of tubal surgery (OR=21)
- previous sterilization (OR=9)
- previous ectopic pregnancy (OR=8)
- DES exposure (OR=5)
- known tubal disease (OR=4-21)
- IUD pregnancy (OR=3)

Minor Risks for Ectopic Pregnancy

Fertil Steril 1997 67(4):791-2

- History of PID, chlamydia or gonorrhea infection (OR=3)
- Infertility (OR = 2-21)
- Greater than 1 lifetime sexual partner (OR=2)
- Smoking (OR=2)*



Diagnosis of Abnormal Pregnancy

- No intrauterine pregnancy with hCG in discriminatory zone
- Abnormally rising hCG
- Progesterone level under 5

Diagnosis of Ectopic Pregnancy

- Surgical visualization
- No intrauterine pregnancy and suspicious mass with hCG in discriminatory zone
- D&C specimen fails to show villi

Treatment for Ectopic

- Surgical is the gold standard
  - reported false positive & false negative of 3%
- Medical treatment
  - methotrexate
- Expectant management
  - tubal SAB
- Don't forget rhogam

Surgical Treatment

- Definitive diagnosis
- Similar fertility rate to medical treatment
- Similar future ectopic rate also
- Salpingotomy vs salpingectomy
  - salpingectomy for definitive treatment
  - similar fertility rates if contralateral tube is patent

Medical Treatment

- Single IM dose of methotrexate 50mg/m2
- Patient must be immunocompetent and have normal CBC
- Main risk is stomatitis and GI upset, rarely see bone marrow depression, liver or renal impairment

Medical Treatment 2

- hCG may rise between days 0-4
- Repeat MTX if there is not a 15% drop in hCG between days 4 and 7
- Weekly hCG titers until 0 or plateau
- Surgical management vs second dose for plateau
- 70-80% successful

Contraindications to MTX

- Adnexal mass >3.5cm with cardiac motion
- Adnexal mass >4.0cm without cardiac motion
- Hemodynamically unstable
- Severe pelvic pain
- Unable to comply with follow-up
  - blood draws weekly for up to 8 weeks, no alcohol, no folate

Expectant Management

- If hCG is dropping already and below the discriminatory zone
- If there is no IUP and mass <3.5 cm on ultrasound
- Approximately 70% require no further treatment
- The mass may take up to 3 months to resolve