CAUSES OF SPONTANEOUS ABORTIONS

FLAME LECTURE: 85

BURNS 11.11.23

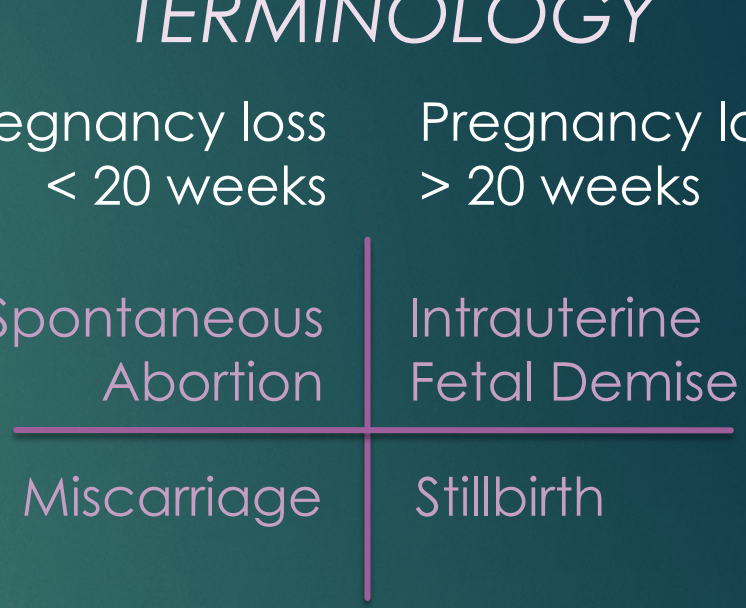
LEARNING OBJECTIVES

- Describe the causes of spontaneous abortions
- See also:
  - FLAME LECTURE 81: EVALUATION OF 1ST TRIMESTER VAGINAL BLEEDING
  - FLAME LECTURE 86: MANAGEMENT OF SPONTANEOUS ABORTIONS

DEFINITIONS

- Spontaneous abortion (SAB) is pregnancy loss before 20 weeks, whereas intrauterine fetal demise is a demise after 20 weeks
- Early pregnancy loss (EPL) is empty gestational sac or embryo/fetus without heartbeat <13 weeks
- After confirmation of intrauterine pregnancy, any bleeding before 20 weeks is considered a threatened abortion, until proven otherwise

TERMINOLOGY



Epidemiology

- Most common complication of early pregnancy
- Incidence is at least 8-20% of all pregnancies
  - But the epidemiology is complicated by fact that many very early pregnancy losses (<6 weeks) can occur before patient or provider is even aware she is pregnant (i.e., often mistaken as late period)
  - Studies suggest that if preclinical losses are included, ½ of all conceptions end in pregnancy loss
  - Incidence is ~5% for women who have previously carried child to term

Risk Factors

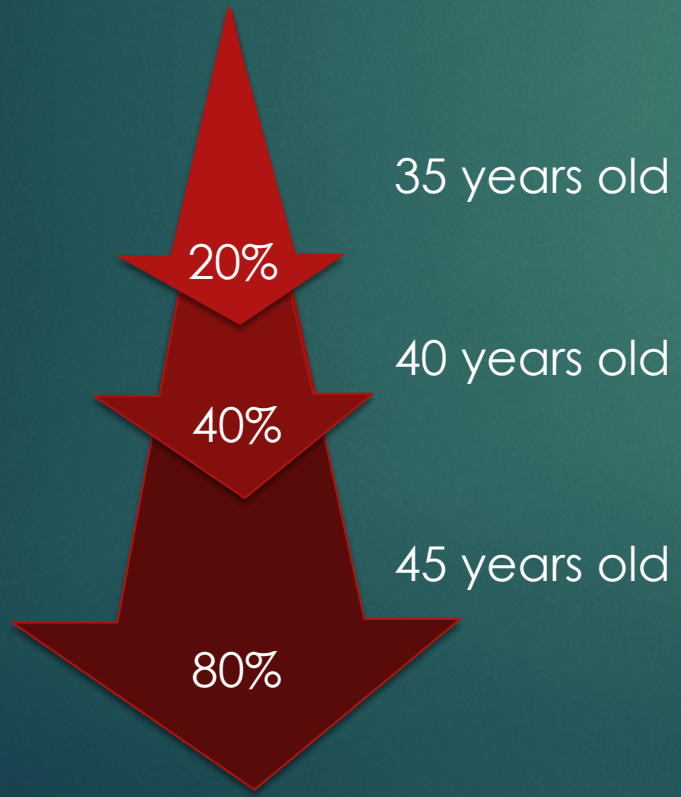
- Maternal Age
- Previous SAB
- Smoking
- Alcohol use
- Cocaine
- NSAIDs limited studies suggest may interfere with prostaglandin action required for implantation
- Caffeine: undetermined risk, but high levels of intake (>10 cups of coffee or 1000mg per day) most concerning
- Untreated celiac disease (treated celiac disease ok)
- Extremes in maternal weight (BMI <18.5 or >25)

Risk Factors

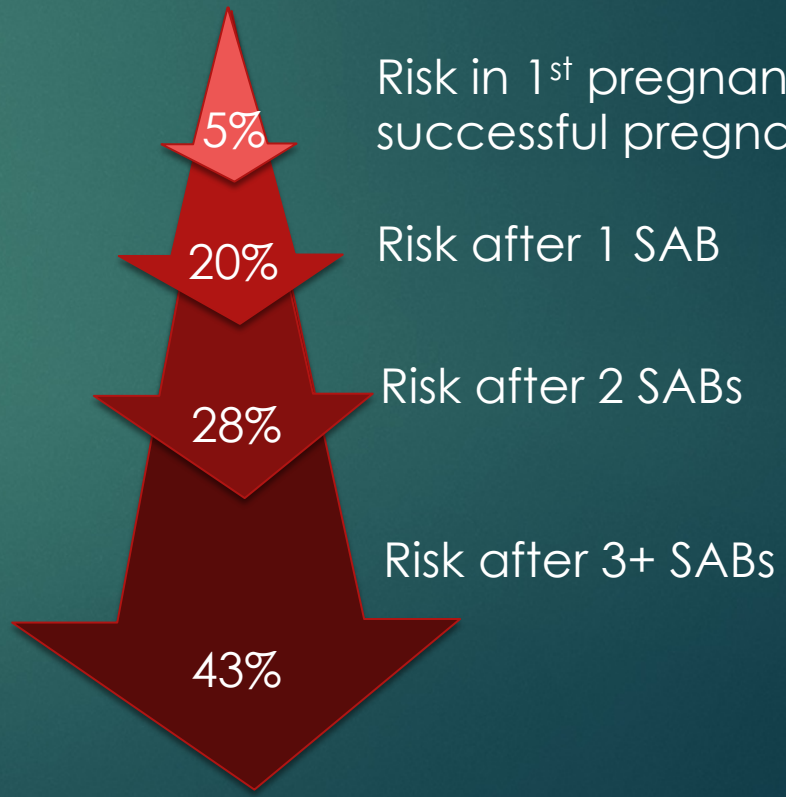
- Pregnancy loss risk decreases with gestational age:

  First Trimester > Second Trimester > Third Trimester

- Risk increases with maternal age:



- Risk increases with recurrent pregnancy loss:



Causes of SABs – Fetal Issues

- Chromosomal Abnormalities – 50% of all miscarriages
  - Aneuploidy most common abnormality
  - The earlier the SAB, the more likely that there are chromosomal abnormalities present
    - 90% of < 8-week SABs vs. 50% of 8-11wk SABs vs. 30% of 16-19wk SABs
- Exposure to teratogens
  - Maternal disease (ex. elevated sugars in DM)
  - Illicit drugs
  - Environmental chemicals
- Physical or emotional stressors
- Congenital anomalies
- Trauma

Causes of SABs – Maternal Issues

- Uterine structural abnormalities
  - Septate uterus most commonly associated with risk of miscarriage
  - Uterine leiomyoma (fibroids)
    - Submucosal fibroids most affect fertility and SAB rate
  - Incompetent Cervix (see Slide 10)
- Maternal Infection
  - Parvovirus B19, Toxoplasma, Rubella, HSV, CMV, Listeria, Zika
- Maternal Disease
  - Uncontrolled chronic conditions (DM, HTN, hypo/hyperthyroidism, hyperprolactinemia)
  - Thrombophillias: *commonly causes 2nd trimester loss*
    - Antiphospholipid Syndrome (hypercoagulable state)
    - Factor V Leiden
- Unexplained

Causes of SABs – First vs Second Trimester

First Trimester	Second Trimester
Chromosomal Abnormalities	Maternal infection
Teratogens / Environmental Exposure	Maternal Uterine/Cervical Anatomic Abnormalities
Maternal Uterine Abnormalities	Trauma
Maternal Infection	Incompetent Cervix/Preterm Labor
Unexplained	Chromosomal Abnormalities

Incompetent Cervix

- *Painless dilation and effacement of cervix prior to term*
- Can lead to:
  - Infection from exposure to vaginal flora
  - Rupture of membranes and miscarriage
    - 15% of 2nd tri miscarriages
- Preterm labor vs. Incompetent Cervix
  - Preterm Labor: cramping → cervical changes
  - Incompetent cervix: painless cervical change first, cramping may or may not follow
- Management or prevention:
  - Viable pregnancy: betamethasone, close monitoring (potentially inpatient)
  - Pregnancy <24 0/7 weeks: consider vaginal cerclage (suturing to close cervix) or vaginal progesterone
  - Prevention: if have history of incompetent cervix, can prophylactically place cerclage at 12-14 wks until term (history-indicated cerclage)

RISK FACTORS:

- Hx of dilation & curretage
- Hx of LEEP or cervical cone biopsy for cervical cancer prevention
- DES exposure in utero
- Uterine anomalies

More on **FLAME 147:** Cerclage

Recurrent Pregnancy Loss (RPL)

- Definition: >2-3 spontaneous abortions *(depending upon definition)*
- Causes are typically similar to single SABs but certain causes are more likely in recurrent pregnancy loss:
  - Antiphospholipid antibody syndrome: 8-42% of RPL
  - Anatomic (uterine anomalies, fibroids): 2-38% of RPL
  - Cytogenic (aneuploidies, balanced translocations): 2-5% of RPL
  - Hormonal/Metabolic (Diabetes, Thyroid disease, Prolactinoma)
  - Infectious
  - Male factors
  - Psychological
  - Alloimmune
  - Occupational or environmental hazards
  - Personal habits

Workup featured in **FLAME 86:** Mgmt of SAB

REFERENCES & RESOURCES

- UpToDate:
  - Spontaneous abortion: Risk factors, etiology, clinical manifestations, and diagnostic evaluation
  - Definition and etiology of recurrent pregnancy loss
- Callahan, Tamara L., and Aaron B. Caughey. *Blueprints Obstetrics & Gynecology*. Philadelphia: Wolters Kluwer Health/Lippincott William & Wilkins, 2009. 6th ed.
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