One and One Equals Two: Dealing With Obstetrical Trauma In The Field

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Content Description: Caring for pregnant patients causes anxiety for the patient, their family and the healthcare providers involved. This lecture will discuss the unique characteristics of the pregnant trauma population and offer information on how best to care for them.

Learning Outcomes:
At the end of the session the participant will be able to:
1. Identify common mechanisms of injury associated with the pregnant patient.
2. Describe the physiologic changes as a basis for signs and symptoms.
3. Discuss the most common traumatic obstetric injuries.
4. Plan appropriate assessment and interventions for the pregnant patient.

Outline:

I. Introduction

A. Epidemiology

B. Mechanisms of Injury
1. Blunt
2. Penetrating
3. Blast

4. Burn

II. Physiologic Changes of Pregnancy

A. CV

- pregnant woman is normally in a hyperdynamic and hypervolemic state
- HR increases 10-15 beats above baseline
- BP decreases by approx 15-20% during early stages and then returns to normal
- Cardiac output increases 35% above baseline
- Maternal plasma volume increases 40-50% by end of first semester
- Anemia of pregnancy

B. Respiratory

-tidal volume increases by 40%
- Vital capacity increases 100 to 200 ml
- Respiratory rate increases slightly
- Arterial blood gases reflect compensated respiratory alkalosis due to hyperventilation
    - $PaCO_2$: 30 mm Hg (4.0 KPa)
    - PaO_2 : 101 to 104 mm Hg (13.5 to 13.9 KPa)
- Decreased functional residual capacity

C. Abdominal

- Physiologic ileus, which causes decreased gastric motility
- Vomiting/aspiration, which increased emptying time due to hormonal changes
- Rebound tenderness decreased
- Abdominal guarding decreased

D. Urinary

- Urinary frequency: Increased glomerular filtration and increased pressure of uterus on bladder
- Bladder elevated out of pelvis (late pregnancy)
- Glycosuria (not proteinuria)

E. Neurological

- Pregnancy induced hypertension (PIH)
- Increased blood pressure
- Proteinuria
- Edema
- May result in seizures
- Can mimic head injury

G. Musculoskeletal
- Pelvis less susceptible to fractures
- Relaxation of sacroiliac (SI) joint: Hormonal changes
- Symphysis pubis widened 4 to 8 mm (3rd trimester)

III. Common Traumatic Obstetrical Trauma

A. Premature Labor
- most frequent complication in the pregnant trauma patient
- Signs and Symptoms
  - Uterine contractions greater than 6 per hour
  - Patient may or may not sense contractions
  - Back pain
  - Vaginal discharge
  - Cervical dilation or effacement

B. Abruptio Placenta
- premature partial or total separation of the normally implanted placenta from the uterine wall
- common cause of fetal death after MVC
- Signs and Symptoms
  - Vaginal bleeding (absent if retroplacental)
  - Uterine tenderness
  - Premature labor
  - Abdominal cramps
  - Maternal hemorrhage (shock)
  - Fetal distress
  - Increasing fundal height

C. Uterine Rupture
- caused from extreme compression or a history of cesarean sections
- Signs and Symptoms
  - Abdominal pain
  - History of acute pain followed by no pain
  - Uterine tenderness
  - Difficulty identifying fundal height
  - Vaginal bleeding
  - Maternal hemorrhage and shock
  - Absent fetal heart tones

D. Maternal Cardiopulmonary Arrest/Fetal Delivery
- Successful outcome for fetus if:
- Procedure within 5 minutes of arrest (70% fetal survival)
- There is viable fetal gestational age (> 26 weeks)

- Continuation of CPR throughout cesarean section
- Availability of a neonatal resuscitation team
- Correction of maternal acidosis

IV. Assessment and Interventions

A. Assessment

1. History
   - What was the mechanism of injury?
   - Was the patient wearing a restraint device?
   - Last menstrual period (LMP)?
   - Estimated date of confinement (EDC)?
   - Problems or complications during this or other pregnancies?
   - Are uterine contractions or abdominal pain present?
   - Is there fetal activity?

2. Physical Assess
   - Inspect
   - Perineum
   - Vaginal opening
   - Observe
   - Shape and contour of the abdomen
   - Abdomen for signs of fetal movement

3. Auscultation
   - Fetal heart tones (120 to 160 beats/min)
   - Maternal pulse and discriminate between the two pulses

4. Palpation
   - Height of fundus
   - Symphysis pubis: 12 weeks
   - Umbilicus: 20 weeks
   - Costal margins: 36 weeks

B. Diagnostic Procedures

1. Radiologic Studies
   - Shield fetus from unnecessary radiographs
   - Intravenous pyelogram (IVP)
   - Computerized tomography scan
   - Ultrasonography

2. Laboratory Studies
   - Type and crossmatch
   - Bicarbonate and lactate
   - PT and PTT
   - Beta Human Chorionic Gonadotropin (BHCG)
   - Kleihauer-Betke Test

C. Other Procedures
- Diagnostic peritoneal lavage
- Pelvic exam
- Monitor fetal heart tones (FHT) and rate
- Monitor uterine contractions

D. Psychosocial
- the patient
- the family
- the staff

V. Determing the Next Course of Action

A. Evaluation and Ongoing Assessment
1) Airway
2) Breathing
3) Circulation
4) Disability
5) Exposure
6) Secondary Survey

B. Admission, Discharge or Transfer

VI. Conclusions

A. Where Do We Go From Here?

B. Future of Pre-Hospital Fetal Care

C. Questions

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