Postpartum Complications

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Objectives

• Discuss Postpartum Complications
  • Infection
  • PPH
  • DVT/PE

Parenthood

• Becoming a parent creates a period of change and instability for those having children.
• Biologic as well as adoptive parents experience profound change in:
  • identity
  • roles and relationships
  • patterns of behavior
Transition to Parenthood

- **Bond**
  - A unique and special type of relationship

- **Attachment**
  - A bond that develops between parents and their infant

- **Goal**
  - To maximize opportunities for parents to become acquainted and comfortable with their baby.

Postpartum Complications

- Infection
- Hemorrhage
- Thromboembolic

Postpartum Infection

- Definition: infection with temperature
  - 38 °C (100.4°F) after delivery
- Types:
  - Endometritis is the most common
    - Urinary tract
    - Breasts
  - C/S wound infection 3-4 days post-op
- Causative agents
  - Anaerobic streptococci
  - Clostridium
  - Group A or B hemolytic streptococcus
Postpartum Infection (cont)

- Predisposing factors
  - Prolonged labor (>24 hrs)
  - Anemia
  - Traumatic delivery
  - Premature/prolonged rupture of membranes
  - Postpartum hemorrhage
  - Cesarean birth

Chorioamnionitis 1-2% of pregnancy diagnosed with

Postpartum Infection (cont)
- Physical findings
  - Large tender uterus and fundus on 3rd PP day
  - Lower abdominal pain
  - Malaise/extreme lethargy
  - Chills, headache, backache
  - Foul smelling lochia
  - Increased pulse (100-140 bpm)
Postpartum Infection (cont)

- Interventions
  - Obtain cultures
  - Administer antibiotics & antipyretics
  - Assess vital signs
  - Assess pain/provide analgesics
  - Provide rest periods
  - Monitor and record I&O
  - Encourage fluids

Question

Predisposing factors for puerperal infections do NOT include:
A. Twin pregnancy
B. Premature rupture of membranes
C. Prolonged labor
D. Antepartal infection

Answer

Predisposing factors for puerperal infections do NOT include:
A. Twin pregnancy
B. Premature rupture of membranes
C. Prolonged labor
D. Antepartal infection
Mastitis

WOUND INFECTIONS

Perineum
Risk Factors:
- Infected lochia
- Fecal contamination
- Poor hygiene

Abdominal incision
Risk factors:
- Diabetes
- Hypertension
- Obesity
- Corticosteroid treatment
- Immunosuppression
- Anemia
- Prolonged labor
- Prolonged rupture of membranes
- Prolonged operating time
- Abdominal twin delivery
- Excessive blood loss

Hemorrhage!
One of the top 5 leading causes of maternal death
Estimated 140,000 deaths annually
>500ml blood loss for vaginal birth
>1,000 ml blood loss for cesarean birth
Postpartum Hemorrhage

- Cause of maternal deaths
- Defined as blood loss > 500ml after vaginal delivery; >1000ml after C/S

Etiology
- Uterine atony 80% of cases due to atony
- Lacerations
- Hematomas
- Retained placental fragments
- Uterine inversion
- Coagulation disorders

Two Types of PPH

- Primary Postpartum Hemorrhage
  - Occurs within 24 hours of delivery

- Secondary Postpartum Hemorrhage
  - Occurs 24 hours to 6 weeks after delivery

- Most Cases (99%) of postpartum hemorrhage are primary

Postpartum Hemorrhage (cont)

- Predisposing factors
  - Precipitous/ prolonged labor
  - Overstretching of uterus
  - Drugs
  - Toxins
  - Trauma
  - Prior PP hemorrhage
  - Past placental abnormality
  - Grand multi-parity
**Clinical Signs of Shock?**
- Tachycardia
- Hypotension
- Tachypnea
- Oliguria
- Delayed peripheral capillary refill

**Consequence of PPH**
- DIC
- Sepsis
- Transfusion and/or reaction
  - Fluid overload
  - Anemia
  - Sheehan Syndrome

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**Thrombin**
- Thrombin
  - Activation
  - Antifibrinolytic
  - Procoagulant

**Tissue**
- Inflammatory
  - Necrotic
  - Infarct
  - Infarct products of coagulation

**Tone**
- Smooth muscle contraction
  - Decrease
  - Increase

**Trauma**
- Concomitant
  - Injury
  - Shock

**Other**
- Abnormalities
  - Anemia
  - Uterine artery
  - Hypertonicity
  - Uterus prolapse
Case Example: 24yo G2 P1 at 38 wks gestation induced for "tired of being pregnant":

- After 8hr active phase and 2 hr 2nd stage, had a NSVD of an 8lb 6oz infant.
- After placental delivery, she had an episode of atony that firm with massage. A second episode responded to IM methergine and the physician went home (now 1am).
- The nurses called the physician 30 min later to report more bleeding and further methergine was ordered.
- 60min after the call, the physician performed a D&C with minimal return of tissue. More methergine was given.
Case Example: 24yo G2 P1 at 38 wks gestations induced for “tired of being pregnant”. (cont.)

- 45 min later a second D&C was performed, again with minimal returns. EBL now >2,000 ml.
- Delays in blood transfusion because of inability to find proper tubing.
- Anesthesia is delayed, but a second IV started for more crystalloid. VS now markedly abnormal, P=144, BP 80/30.
- One further methergine given and patient taken for a 3rd D&C. Now has gotten 2u PRBCs
- After D&C is complete, she had a cardiac arrest from hypovolemia /hypoxia and was taken to the ICU when she succumbed 3 hours later.

Postpartum Hemorrhage

- Deficient fluid volume

  I. Assess height & midline position of fundus (massage, breastfeed)
  I. Monitor lochia/bleeding (1gm=1ml)
  I. Monitor and record vital signs (HR, BP)
  I. Position flat with legs elevated
  I. IV infusion (Lactated Ringers or Saline)
  I. Catheterize distended bladder
Methods to Estimate Blood Loss

Quantifying blood loss by weighing
• Establish dry weights of common items
• Standardize use of pads
• Build weighing of pads into routine practice
• Develop worksheet for calculations

Establish Dry Weights

Quantifying blood loss by measuring
• Use graduated collection containers (C/S and vaginal deliveries)
• Account for other fluids (amniotic fluid, urine, irrigation)

Methods to Estimate Blood Loss

Develop Training Tools: Visual aids displayed in Labor & Delivery and/or Postpartum areas are guides for more accurate visual estimation (visual aids can be displayed discreetly for clinicians)
What is Active Management of the 3rd Stage?

- Oxytocin (10u) IV or IM with delivery of infant or placenta
- Gentle controlled cord traction
- Cord clamping not delayed beyond 2 min
- Vigorous fundal massage (at least 15 sec) after placenta

Cook “Bakri” Intrauterine Balloon
- There are now several balloons, but the most available in the US is the Cook “Bakri” Balloon
  - Specifically designed for this purpose
  - Double lumen (for drainage from above)
  - Silicone (non-latex)
  - Uterine contour shape
  - Good filling capacity (saline)
  - Inexpensive
  - Easy to use

B-Lynch Compression Suture
“Belt and Suspenders”
Lessons from Combat in Iraq

- Lowest losses ever from hemorrhage
- Key: increased FFP:RBC ratio

Why a Protocol for Obstetric Hemorrhage?

- Now a complex series of steps that involve many staff members and departments
- Communications!
- PPH seems to always happen at night or weekends…(when people may be tired or there are less resources)
- We can improve…

Postpartum Hemorrhage

- Deficient fluid volume
- I. Administer Medications: Oxytocin, Methergine, Prostaglandin
- I. Blood cross match
- I. Antibiotics
- I. Check for retained placental fragments
- I. Surgical intervention is last resort
- O. Fundus, lochia, VS, I&O
Postpartum hemorrhage is defined by an excess blood loss of ___ ml at the time of vaginal delivery.
A. 200
B. 500
C. 1000
D. 1500

When the diagnosis of uterine atony is made for persistent uterine bleeding, it can be managed by massaging the uterus to stimulate contractions and administering:
A. Magnesium Sulfate
B. Oxytocic medications
C. Vitamin K to the mother
D. Dextrose intravenously
Answer

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Four Major Recommendations for California Birth Facilities:

- Improve **readiness** to hemorrhage by implementing standardized protocols (general and massive).
- Improve **recognition** of OB hemorrhage by performing on-going objective quantification of actual blood loss during and after all births.
- Improve **response** to hemorrhage by performing regular on-site multi-professional hemorrhage drills.
- Improve **reporting** of OB hemorrhage by standardizing definitions and consistency in coding and reporting.
Thromboembolic Diseases (TED)

- Defined as an infection of the lining of a vessel in which a clot attaches to the vessel wall; ↑ risk for pulmonary embolism/death r/t obstruction of circulation to lung.
- Occurs in legs or pelvis
- Incidence < 1% PP

Virchow’s Triad

- Venous stasis
- Endothelial injury
- Hypercoagulability

Thromboembolic Diseases Types

- Superficial Thrombophlebitis (0.15-1.4%)
- DVT (0.36-3.0%)
- Pulmonary Embolism (0.04-1.2%)
- Septic Pelvic Thrombophlebitis (0.1%)
Venous Thromboembolism (VTE)

Leading cause of Maternal M&Ms

Maternal Mortality may exceed 10-15% in untreated DVT due to Pulmonary Embolism;
Proper treatment ↓ risk to < 1%

Importance (cont)

- US Dept of Health and Human Services Agency for Healthcare Research and Quality
- #1 safety practice recommendation in 2001 was appropriate use of prophylaxis to prevent venous thromboembolism
- Estimated cost $10k per DVT, $20k per PE
- 2007 dollars

Pulmonary Embolism

The condition where a plug composed of a detached clot, bacteria or other foreign body occludes a blood vessel in the pulmonary circulation. During pregnancy, 2 types:

- Thromboembolism
- Amniotic fluid embolism
Pulmonary Embolism

- Incidence in PP period 0.5 – 3 per 1000 women
- DVT ↑ risk of PE 3-8x PP
- Causes: Venous stasis
  Hypercoagulation state

Postpartum Thromboembolism

- Predisposing factors
  - Use of oral contraceptives
  - Obesity
  - Sedentary
  - Hemorrhage
  - Operative delivery (C/S)
  - Smoking
  - Heart disease
  - Pre-Eclampsia/Eclampsia
  - + Lupus Anticoagulant
  - + Anticardiolipin Antibody

- Predisposing factors (cont.)
  - Anemia
  - Long labor
  - Post delivery pelvic infection; hx endometritis
  - Varicosities
  - ↑ parity; advanced maternal age
  - Sickle Cell Disease
  - Blood Type other than “O”
DVT & Pulmonary Embolism
...are not likely to be confirmed by clinical diagnosis alone; needs extensive, invasive and expensive diagnostic evaluation/technology.

Mnemonic Guide for Steps of Patient Care for Pulmonary Embolism

C Clinical Findings
L Laboratory Data
O Objective Data
T Treatment

Findings
- Dyspnea
- Hemoptysis
- Pleuritic Pain
- Tachypnea
- Diaphoresis
- Shock
- Syncope
- ↑HR, ↓BP
- ↑ Temperature to 40.5°C (105°F)
- Leg pain/tenderness & swelling, hot to touch, redness along vein
  * Change in pain perception
  * Anxiety
Postpartum Thromboembolism

- Diagnostic procedures
  - H&H
  - Doppler ultrasound
  - Impedance Plethysmograph
  - Contrast venography

- Ineffective tissue perfusion
  I. Encourage bed rest
  I. Administer medications
  - Anticoagulants-Heparin IV
  - Antibiotics
  - Analgesics
  I. Administer O2
  I. Encourage fluids

- Ineffective tissue perfusion (cont.)
  I. Assess s/s of embolism
  I. Assess VS
  I. Assess infection site
  I. Instruct avoid oral contraceptives
  O. VS stable
  O. No s/s of embolism
Anticoagulation Treatment

- Heparin is unfractionated Heparin
- Enoxaparin (Lovenox) is a low molecular weight Heparin

Treatment: LMWH vs. Heparin

- Half-life 3-6h vs. 30min
- Less # of injections with LMWH
- Better bioavailability as SQ with LMWH
- Lower osteoporosis with LMWH
- Less monitoring with LMWH
- UFH easier to reverse
- UCSD costs
  - Heparin Q8h $17, SCDs $13.12

VTE Prevention in Obstetrics

- All pregnant women will have a risk assessment for VTE performed
- Two options for thromboprophylaxis
  - Mechanical prophylaxis: graduated compression stockings or sequential compression device (SCD’s)
  - Medication administration: unfractionated heparin (UFH) or low molecular weight heparin (LMWH)
Risk Factor Assessment Tool

<table>
<thead>
<tr>
<th>Classification</th>
<th>Definition</th>
<th>Management options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk A</td>
<td>• Vaginal delivery&lt;br&gt;• &lt; 35 years of age&lt;br&gt;• No additional risk factors</td>
<td>• Hydration&lt;br&gt;• Early ambulation</td>
</tr>
<tr>
<td>Low Risk B</td>
<td>• Prescribed bed rest (&gt; 4 days)&lt;br&gt;• Cesarean Section</td>
<td>• Hydration and&lt;br&gt;• SCD’s (before surgery)</td>
</tr>
<tr>
<td>Moderate Risk</td>
<td>Prescribed bed rest (&gt; 4 days) or Cesarean Section&lt;br&gt;any one of the following risk factors, per MD&lt;br&gt;• &gt; 35 years of age&lt;br&gt;• Obesity&lt;br&gt;• Current pelvic infection&lt;br&gt;• Preeclampsia&lt;br&gt;• Grand multiparity&lt;br&gt;• Multiple gestation&lt;br&gt;• Severe varicosities&lt;br&gt;• Smoking&lt;br&gt;</td>
<td>• Hydration and&lt;br&gt;• SCD’s&lt;br&gt;OR&lt;br&gt;• Prophylactic anticoagulation with Heparin or Lovenox and&lt;br&gt;• Consult Anesthesia</td>
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Risk Factor Assessment Tool (cont)

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<th>Classification</th>
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<th>Management options</th>
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<tr>
<td>High Risk</td>
<td>• ≥ 3 moderate risk factors&lt;br&gt;• Extended surgery (C/Hysterectomy)&lt;br&gt;• Personal history of VTE&lt;br&gt;• Antiphospholipid syndrome or Thrombophilia</td>
<td>• Hydration&lt;br&gt;• SCD’s&lt;br&gt;AND&lt;br&gt;• Prophylactic anticoagulation with Heparin or Lovenox</td>
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<td>Very High Risk</td>
<td>• Women with mechanical heart valves&lt;br&gt;• Personal history of DVT with high risk Thrombophilia (Anti-thrombin III deficiency or homozygous Factor V or II mutations)</td>
<td>• Requires full anticoagulation with IV Heparin infusion&lt;br&gt;• Consult Anesthesia</td>
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Prophylactic Anticoagulation

• Heparin: 10,000 – 30,000 units/day SQ in divided doses

• Lovenox: 40 mg SQ QD to BID
Classic Triad of pulmonary embolism

- Dyspnea
- Haemoptysis
- Pleuritic chest pain

In reality the triad occurs in <20% of patients

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<th>Symptoms</th>
<th>Signs</th>
<th>Auscultation</th>
<th>Others</th>
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<tr>
<td>History</td>
<td>Inspection</td>
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<tr>
<td>Dyspnea</td>
<td>Tachypnea</td>
<td>Localised pleural rub</td>
<td>Pyrexia</td>
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<tr>
<td>Haemoptysis (pulmonary infection)</td>
<td>Decreased chest movement (due to pain)</td>
<td>Localised coarse crepitations</td>
<td>Low oxygen saturation</td>
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<td>Asymmetrical</td>
<td>Cyanosis</td>
<td>Pleural rub</td>
<td>Hypotension</td>
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<td>Systolic murmur, widely split 2nd heart sound</td>
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<td>Tachycardia</td>
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<td>Pericardial knock</td>
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Questions?