# Sepsis in Pregnancy

George Barnett, MD FACOG
Associate Professor TTUHSC Amarillo
Department of Ob/Gyn

## Introductory Case

- 27 y/o presents to L&D in active labor at 39 weeks gestation
- After being on L&D she develops hypotension, a fever, and tachycardia
- What are things that would be pertinent to her history and treatment?

# Definition of Maternal Sepsis

- SEPSIS-systemic inflammatory dysregulated host response
  - Can be life threatening
  - Can lead to multiorgan dysfunction and or failure
  - May be antepartum, intrapartum, or puerperium period

# Septic Shock

- Sepsis with persistent hypotension and/or initial lactate >4mmol/L despite adequate fluid resuscitation
  - Hypotension – one of these three are present
    - Non-pregnant-SBP<90 or MAP<65
      - Or 40mmHg drop in SBP
    - Pregnant – SBP<85 or MAP<65
      - Or 40mmHg drop in SBP

# Hypotension

- Initial Hypotension
  - Two hypotensive BP readings within three hours
- Persistent Hypotension
  - Two consecutive hypotensive blood pressures in the one hour following fluid resuscitation

# Sepsis

- Occurs 9-49/100,000 deliveries worldwide
- Third most common cause of maternal mortality (11-15%)
- Pregnant patients may appear stable prior to rapid deterioration
  - Physiologic changes in pregnancy help compensate
- Early detection and treatment is critical to improve outcomes
- MEOWS-Modified Early Obstetric Warning System should be obtained on every patient presenting to L&D

## Signs and Symptoms

- Lethargy
- Chills/Rigors
- Fever
- Malaise
- Rashes
- Abdominal/Pelvic Pain

## Signs and Symptoms

- Foul Smelling Lochia
- Foul smelling leakage of fluid
- Engorgement
- Uterine Tenderness
- Altered Mental Status
- End-Organ Dysfununction

# Diagnostic Criteria

- Two or More Criteria With Presumed or Confirmed Infection
  - Temperature <36C (96.8) or >38C (100.4)
  - Heart Rate <50 or >110
  - Respiratory Rate <12 or >24
  - WBC <4,00 or >15,000
  - Bands >10%
  - Known source of infection
    - Wound infection, chorioamnionitis, pyelonephritis

# Risk Factors

- Primiparous
- Multiple gestation
- Invasive procedures
- GBS
- PPROM
  - CVS
  - Amniocentesis
  - Cerclage
- Retained Products of Conception

# Risk Factors

- Multiple Vaginal Exams
- Operative Delivery
- Vaginal Trauma
- Cesarean Section Complications
  - Adhesions
  - Hysterotomy Extension
  - Bladder or Bowel Injury
- Manual Placental Extraction

# High Risk Patients

- Obesity
- Immunosuppressed
  - Due to Medication or Preexisting Medical Condition
- Anemia
- Diabetes/Impaired Glucose Tolerance
- Advanced Maternal Age

# High Risk Patients

- Disadvantaged Socioeconomic Background
- CHF
- Chronic Liver or Renal Failure
- SLE
- History of GBS

# Severe Sepsis

- Sepsis Plus Organ Dysfunction
  - SBP <85 mmHg or MAP <65 mmHg
  - SBP decrease of 40 mmHg
  - Acute Respiratory Failure
  - Creatinine > 1.2
  - Urine Output < 0.5mL/kg/hour for two hours
  - Total Bilirubin > 2mg/dL
  - Platelets <100,000
  - INR >1.5 or aPTT >60sec
  - Lactate >2mmol/L
    - N/A during active labor

# Initial Management

- Evaluate and Diagnose Sepsis to start management within an hour
- Activation of Code Sepsis
  - Document the recognition
  - Work as a team to begin the management between nursing staff, hospital staff and physicians
  - Assess and perform a medical evaluation including a history and physical

# Labs and Diagnostic Tests

- Blood Cultures Prior to Antibiotics
- IV Acess
- Lactic acid, CBC, CMP, CCUA
- Consider PT, PTT, Fibrinogen
- Repeat Lactic Acid per Protocol
- Other Diagnostic Tests
  - Urine Culture
  - Sputum
  - Throat swab
  - CXR
  - CT scan

# Management

- IV Fluids
  - Bolus LR or NS at 30ml/kg within 3 hours if lactate is >4mmol/L
  - May modify if the patient is pre-eclamptic, cardiac issues, pulmonary edema, …
  - ABG's are necessary if lactate is >4mmol/L
  - Consider vasopressors if MAP is 65 or greater despite fluid resuscitation
  - BP monitoring and pulse every 30min
- IV Antibiotics
  - Start broad spectrum antibiotcs
  - Consider allergies
  - Do not delay administration as morbidity increases

# Management

- Fetal Monitoring
  - Continuous monitoring to assess fetal status
- Oxygenation
  - Maintain O2 saturation >94%
  - ABG's if indicated
  - O2 at 15L/min via nonrebreather mask to obtain saturation
  - Consider intubation based on patient status
- Urine Output
  - Strict I&O monitoring and consider a catheter

# Management

- Reassess MEOWS and escalate/deescalate accordingly
- Repeat Lactic Acid within 6 hours if the initial level was >2mmol/L
- SCD's are recommended
- Target Hgb of 9 g/dL and transfuse if <7 g/dL
- Stress ulcer prophylaxis
- Continue to investigate source of infection and use antibiotics accordingly

# Timing of Delivery

- Gestational age and fetal status
- Source of infection?
- Deliver if the source is intrauterine
- Corticosteroids should be considered based on gestational age however risks and benefits should be considered
- Anesthesia consultation is important

# ICU Admission

- Worsening hypoxia
- Increasing O2 requirements
- Hypotension
- Organ dysfunction
  - Worsening renal or hepatic function
  - Altered mental status
  - DIC
- Placental insufficiency
- Lactic acidosis