Amniotic Fluid Embolism Syndrome

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Definition

• “anaphylactoid syndrome of pregnancy”
• Unclear incidence: 1 in 8000-80,000
• Timing
  • 70% during labor
  • 11% after vaginal delivery
  • 19% during cesarean
• National registry
Pathogenesis

• Amniotic fluid probably enters the maternal circulation through a broken blood vessel
  • endocervical veins
  • placental insertion site
  • a site of uterine trauma
Diagnostic Criteria

• Acute hypotension or cardiac arrest
• Acute hypoxia
• Coagulopathy or severe hemorrhage in the absence of clinical explanation AND
• Onset: during or within 30 minutes of labor, c-section, or dilation and evacuation
• May not have laboratory diagnosis
• No criteria have been agreed on
A. Amniotic fluid and fetal tissue gain access to the maternal circulation via a defect in the placenta.

B. The uterine veins and inferior vena cava carry the material up to the mother's heart and out to the lungs bilaterally.

C. The fetal material makes its way through the lungs and returns to the heart where it is pumped out to the entire body.
Associations

• precipitous or tumultuous labor
• advanced maternal age
• cesarean and instrumental delivery
• placenta previa and/or abruption
• grand multiparity
• cervical lacerations
• fetal distress
• eclampsia
• induction of labor
• uterine rupture
• Despite associations, current understanding of pathogenesis suggests that factors probably are not cause of amniotic fluid embolism syndrome

• The syndrome is best considered unpredictable and unpreventable
Clinical Presentation

• Abrupt and fulminant onset
• Aura
• Cardio respiratory failure
  • Oxygen desaturation, dyspnea, tachypnea, cyanosis, crackles, wheeze
  • Cardiogenic shock
• Hemorrhage-DIC: 80% within 10-30 min
• Neurologic symptoms - seizures common, stroke
• Fetal heart tone abnormalities
Management: SUPPORTIVE!!

• Immediate CPR / support/ ACLS
• Intubation/ mechanical ventilation PRN
• 2 large bore IVs
• Senior staff at bedside: multidisciplinary
• Treatment of hypotension
  • Nor-epinephrine
  • Fluids: small boluses (250 to 500 mL) with re-eval after each
  • Caution with fluids
• Pulmonary edema common in AFE
Management: SUPPORTIVE!

• Anesthesia
• Labs/ Blood products
• Eval for signs of bleeding
• Consider differential diagnosis
• Emergent Cesarean
  • Watch coagulopathies
Labs

- Elevated WBC: nonspecific
- Anemia: nonspecific
- ABGs: hypoxemia
- EKG: sinus tachycardia or arrhythmias
- Imaging: nonspecific
- Features of DIC
  - elevated D-dimer
  - low fibrinogen [especially <200 g/L]
  - thrombocytopenia
If patient survives initial event

• Pulmonary edema often develops
  • worsening dyspnea and tachypnea, crackles, as left ventricular failure resolves
• ICU
• EKG
• Hemodialysis with plasmapheresis?
Survivability / Outcomes

• Maternal mortality rate 20 to 50%
  • Hypoxemia causes 50% of deaths that occur within the 1st hour
  • 85% die from cardiogenic shock or cardiac arrest

• Survivors generally have a poor outcome
  • 85% significant neurologic injury due to cerebral hypoxia
  • Only 7% neurologically intact

• Neonatal outcomes also poor
  • Mortality rate 20 – 60%
  • 70% of survivors are neurologically intact
Other Treatment Options

- Inhaled nitric oxide/ right ventricular assist device have been used in patients with pulmonary hypertension and right ventricular failure

- Cardiopulmonary bypass ECMO
  - Requires anticoagulation

- Recombinant human factor VIIa for coag issues
Thank you