Episode 160: Non-OB Surgery in Pregnancy With Dave Berman

On this episode: Dr. Jed Wolpaw and Dr. Dave Berman

In this 160th episode I welcome Dr. Dave Berman back to the show to discuss anesthesia for non-OB surgery during pregnancy.

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Introduction

0:00 – 6:22

- Incidence of non-obstetrical surgery is 0.5-1% of all pregnancies
- Practice Guidelines for Obstetric Anesthesia highlighted key principles:
    - Women should never be declined medically necessary surgery because they are pregnant
    - If need to perform surgery in pregnancy, but it can wait, do it in the 2nd trimester
        - 1st trimester risks: spontaneous abortion, exposure to anesthetics during organogenesis
        - 3rd trimester risks: preterm labour
    - Biggest thing to cause fetal harm is fetal malperfusion; happens during maternal hypercarbia, acidemia, hypoxia
    - Should not be done at free-standing ambulatory center if there is thought about delivering; credentialed provider should be present
    - Pregnant women are at risk for VTE → take precautions to minimize risks in perioperative period

Management Strategy

6:23 – 9:30; 15:20 – 16:49

- Key questions: what the case is? How urgent? How pregnant women is? How has the pregnancy been like (eg. complications)?
- An anesthesiologist with OB experience is preferred
    - Specialized surgeries (eg. cardiac surgery) is preferred to be done by anesthesiologists who regularly do these cases in consultation with OB anesthetists and maternal-fetal-medicine physicians
- Pregnancy and difficult airway go hand in hand, but incidence of problems is low (<1% maternal mortality in US due to anesthesia related complications)
    - Have all difficult airway material be available
    - Ask if airway needs to be managed at all; eg. orthopedic surgery
- Controversial topic on whether all pregnant women should be considered to have full stomach
    - Studies of gastric residual estimation on ultrasound → gastric emptying not delayed until onset of labour or intraabdominal process
    - If patient is NPO, main concern is lower esophageal sphincter tone
- Ensure stable fetal status via ensuring adequate maternal oxygenation, hemodynamics and positioning
- Increased risk for VTE at all stages of pregnancy and post-partum
    - Mechanical devises are a low risk option
    - Consideration for heparin dictated by surgical procedure
    - Dr. Berman's center uses subcutaneous heparin for primary prevention and Lovenox for higher risk patients
- Betamethasone administration and timing should be a group decision with anesthetists, surgical team, MFM/OB, neonatology team
    - Decreases risk of PONV

Changes in Pregnancy

9:31 – 11:00

- Chronic, but incompletely compensated, respiratory alkalosis
  - In pregnancy, normal PaCO2 is 30-32mmHg; normal HCO_3^- is 20-22meq/L
  - When ventilating, target $EtCO_2$ of 25-30mmHg; use ABG for longer procedures
- Decreased anesthetic requirements → mostly related to ↓ spinal reflexes
  - Awareness threshold in pregnancy may not be different
- ↑ circulating plasma volume; ↓ hematocrit → adaptive, in order to ↓RBC lost during delivery

Risks with Anesthetic Agents

11:01 – 15:19

- Most anesthetic agents are FDA classification category C → not enough data because lack of studies on pregnant women
- Benzodiazepines said to be associated with craniofacial abnormalities → based on studies in 1970, although studies were questionnaires and cofounders (eg. maternal smoking) were not accounted for
  - Unlikely that small doses of perioperative benzos to have long lasting effects, especially after the palate is formed → sometimes still avoided for legal reasons
- Nitrous oxide is associated with potential posterior column deficits and inhibition of methionine synthetase, and thus decreased bone marrow production in long term use
  - Short term use not well studied
  - Commonly used labour analgesia
- Ondansetron has weak association with craniofacial abnormalities, congenital cardiac defects
  - Given for hyperemesis which is associated with weight loss, hypovolemia, electrolyte abnormalities that predispose to fetal harm
  - Small, single dose, unlikely to cause harm
- Inhaled agents (and propofol) has black box FDA warning in 3rd trimester of pregnancy and infancy
  - Inhaled agents most well studied with respect to neural apoptosis
  - Some advocate for TIVA in pregnancy to avoid exposure to inhaled agents
    - Dr. Berman's center uses inhaled agents for some fetal surgeries to augment uterine relaxation that can't be achieved with nitroglycerin
- Neostigmine crosses placenta to greater degree than glycopyrrolate → risk of fetal bradycardia
  - Some advocate for neostigmine and atropine combination because atropine cross placenta
  - Others advocate for sugammadex; effects on binding certain steroid hormones, but unknown effects on pregnancy; minimal placental transfer
  - Dr. Berman's center uses sugammadex because risk of inadequate reversal outweighs theoretical risk of sugammadex

Monitoring

16:50 – 20:14

- ACOG and ASA statement:
    - Pre-viable fetuses (<24 wks), only pre- and post-op fetal heart tones checked
    - Viable fetuses monitor with fetal heart rate monitoring and contraction monitoring before and after procedure
    - Continuous fetal monitoring ONLY IF ALL of the conditions are met:
        - Fetus has to be viable
        - Physically possible to perform intraoperative electronic fetal monitoring
        - Healthcare provide with OB surgery privileges has to be available
        - When possible, women has provided consent for emergency C-section
        - Nature of surgery will allow for interruption to provide access for emergency delivery
- There may be specific cases where continuous fetal monitoring is done, but above conditions are not met → monitoring could help change clinical decision making
    - Keep in mind the fetal heart rate variability may not be reliable because of anesthetics

Summary

20:15 – 21:15

- Non-OB surgery in pregnancy is safe
- Appropriate precautions need to be taken
- Drug selection is minimally altered because of pregnancy
- Don't be afraid!

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