Anaesthesia and non-obstetric surgery in pregnancy

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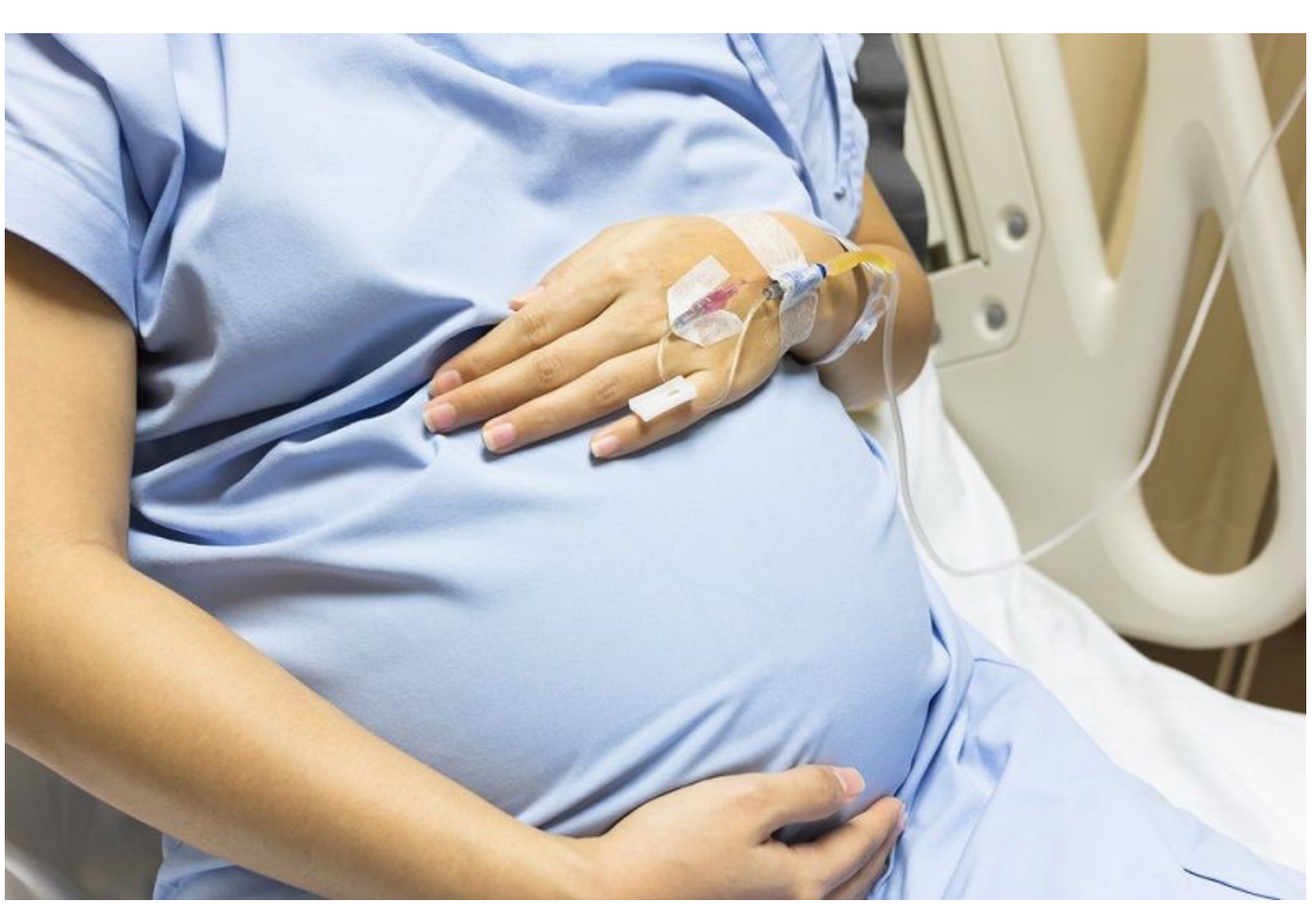

General Anaesthesia For Non-Obs Surgery

When was it asked?

March 2019 question 4 – Pass rate 32.4%

March 2016 question 7 – Pass rate 57.6%

September 2014 Question 3 – Pass rate 33%

What was asked?

- NAP4 recommendations regarding airway management in pregnant women
- Questions related to a patient requiring emergency surgery in the 2nd trimester
  - Risks to the fetus during anaesthesia
  - How to minimise risks to the fetus
  - Pre and intraop steps you could take to ensure fetal safety if 27/40 pregnant
- Factors contributing to difficult airway in pregnant patient
- How to reduce airway related morbidity & mortality associated with GA in pregnancy

Highlights from Chairman's Reports

Overview

- Incidences at around 1-2%.
- Non-Elective surgery should never be denied.
- Postponing elective cases recommended until 6 weeks postpartum.
- Challenges of caring for two patients simultaneously.
- Understanding physiological changes of pregnancy.
- Obstetric and neonatal consultations are critical to patients care.

Fetal considerations

First trimester (weeks 1-12). Start of fetal organogenesis

- Anaesthetic considerations:
  - Avoid:
    - Hypo-/hyperthermia
    - Hypoxaemia
    - Hypercarbia
    - Hypotension
  - No conclusive evidence of fetal teratogenesis and anaesthetic agents.
  - Mind placental drug transfer.

Second trimester (weeks 13-26)

- Lowest risk for preterm delivery.
- Surgical exposure enhanced, as uterus lower in the abdomen.
- Major embryonic development complete.

Third trimester (weeks 29-40)

- Consider corticosteroids for fetal lung maturity.
- Avoid NSAIDs after week 32, premature ductus arteriosus closure.

Fetal monitoring

- Decision to monitor FHR is patient specific.
- Follow the individual Trust guidelines.
- Reduced variability is common during anaesthesia and analgesia.
- Fetal monitoring could alert to requirement for optimisation:
  - Maternal position.
  - Oxygenation.
  - Blood pressure.

Physiological changes during pregnancy

Airway

- Mucosal friability and oedema from 1st trimester.
- Increased vascularity.

Anaesthetic considerations:

- Increased risk of difficult intubation and mask ventilation (NAP 4).
- Avoid nasal intubation.
- Use smaller size ET tube.
- Video-laryngoscope.

Algorithm 1– safe obstetric general anaesthesia

Pre-theatre preparation

Airway assessment
Fasting status
Antacid prophylaxis
Intrauterine fetal resuscitation if appropriate

Plan with team

WHO safety checklist / general anaesthetic checklist
Identify senior help, alert if appropriate
Plan equipment for difficult / failed intubation
Plan for / discuss: wake up or proceed with surgery (Table 1)

Rapid sequence induction

Check airway equipment, suction, intravenous access
Optimise position – head up / ramping + left uterine displacement
Pre-oxygenate to $F_{ET}O_2 \geq 0.9$ / consider nasal oxygenation
Cricoid pressure (10 N increasing to 30 N maximum)
Deliver appropriate induction / neuromuscular blocker doses
Consider facemask ventilation (P_{max} 20 cmH_2O)

1st intubation attempt

If poor view of larynx optimise attempt by:

- reducing / removing cricoid pressure
- external laryngeal manipulation
- repositioning head / neck
- using bougie / stylet

Fail

Ventilate with facemask
Communicate with assistant

2nd intubation attempt

Consider:

- alternative laryngoscope
- removing cricoid pressure

3rd Intubation attempt only by experienced colleague

Fail

Follow Algorithm 2 – obstetric failed tracheal intubation

Success

Verify successful tracheal intubation

Proceed with anaesthesia and surgery

Plan extubation

Physiological changes during pregnancy

Respiratory

- Start from 1st trimester.
- Increased maternal oxygen consumption.
- Increased minute ventilation, by increased tidal volumes.
- Respiratory alkalosis pH 7.44.
- Decrease in functional residual capacity of 20%.

Anaesthetic considerations:

- Allow time for pre-oxygenation before induction.
- Reduce periods of apnoea to avoid rapid desaturation.
- Ventilatory setting to target PeCO2 3.7-4.3 kPa.

Physiological changes during pregnancy

Cardiovascular

- Increase in cardiac output by 50% by the end of 2nd trimester.
- Heart rate and stroke volume greater than in non-pregnant women.
- Vascular resistance decreases.

Anaesthetic considerations:

- Caution in cardiac disease. (74% diagnosed in pregnancy)
- ECHO to assess cardiac function.

Physiological changes during pregnancy

Renal

- Increase in renal blood flow by 75%.
- Increased glomerular filtration rate by 65%.
- Serum creatinine level decreases by end of 1st trimester.

Anaesthetic considerations:

- Impact on fluid and electrolyte balance.
- Drug metabolism and elimination can be altered.
- Elevated levels of creatinine should be investigated.

Physiological changes during pregnancy

Gastrointestinal

- Nausea and vomiting as early as 4 weeks.
- Decrease in lower oesophageal sphincter tone. (secondary to progesterone 36 weeks)
- Mechanical displacement of the stomach.
- Gastric emptying only affected by labour.

Anaesthetic considerations:

- Standard guidance for fasting.
- Antacid prophylaxis.
- RSI with cricoid as indicated.

Anaesthesia

General or regional anaesthesia both safe.

Consider patient's needs and medical history.

Main principles:

- Maintain normotension.
- Avoid hypoxia.
- Avoid acidosis.
- Anaesthetic drugs dose adjustment and decrease in MAC concentration.
- Positioning - avoid aortocaval compression, apply 15º left uterine displacement from 18 weeks gestation or earlier if indicated (twins,↑BMI).
- Recommended reversal - neostigmine and glycoparrolate, suggamedex can be used.

Newly postpartum

Neonatal considerations:

- Transfer of drugs to the breast milk.
- Avoid: codeine, pethidine, tetracycline, amiodarone and statins.

Maternal considerations:

- Return to physiological baseline gradual.
- CO can take up to 24 weeks to return to normal.
- Heart rate stabilises within 2 weeks.
- Dilutional anaemia resolves by 3 weeks postpartum.
- Gastric emptying, volume and pH return to normal 18 h postpartum.

Questions?