

ASPIRATION UNDER ANESTHESIA AND PRECLAMSIA

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ASPIRATION UNDER ANESTHESIA AND PRECLAMSIA

Aspiration can be defined as the inhalation of material into the airway below the level of the vocal cords. It is linked with a range of clinical outcomes, being asymptomatic in some instances and resulting in severe pneumonitis and ARDS in others. Potentially it is a risk in all unconscious, sedated, or anesthetized patients, as lower esophageal sphincter tone decreases and laryngeal reflexes are depressed.

Risk factors under general anesthesia

1. Full stomach/delayed emptying (many causes, including opioids, recent trauma, .D.M, Chronic renal failure, non-fasted patient).
2. Raised intragastric pressure (intestinal obstruction, pregnancy, laparoscopic surgery, high BMI).
3. Anesthesia (gastric insufflation, LMA, light anesthesia, difficult intubation).
4. Lower esophageal sphincter incompetence (Gastro-esophageal reflux, hiatus hernia, pregnancy).
5. Acute alcohol intoxication.
6. Operation factors (emergency, Laparoscopy, Trendelenburg lithotomy position).

Measures to reduce risk:

- 1) Fasting.
- 2) Emptying stomach: - via nasogastric tube.
- 3) Increase lower esophageal sphincter tone, e.g., with metoclopramide(plasil), and prochlorperazine(stemetil).
- 4) Rapid sequence induction of anesthesia.
- 5) Induction in the lateral or sitting position.

- 6) Reduction of aspiration pneumonitis severity: e.g. H₂ receptor antagonists, antacids, proton pump inhibitors.

Diagnosis

Clinical: auscultation may reveal wheeze and crepitations.

Chest X-rays: diffuse infiltrative pattern, especially in the right lower lobe distribution.

If aspiration occurs:

- 1) The patient should be placed in the head-down lateral position.
- 2) Material is aspirated from the pharynx and larynx, and O₂ is administered.
- 3) Tracheal intubation may be necessary to protect the airways and to allow tracheobronchial suction.
- 4) If spo₂ < 90% regardless of 100% O₂, the patient may need bronchoscopy to aspirate solid food particles and ICU admission.

Aspiration pneumonitis (Mendelson's syndrome)

Inflammatory reaction of lung parenchyma following aspiration of gastric contents, a volume of 25 ml of aspirate, of pH 2.5, has been suggested to be required to produce the syndrome, The more acidic the inhaled material, the less volume is required to produce pneumonitis.

Management is mainly supportive, with O₂ therapy, bronchodilator drugs, and removal of aspirate and secretions by physiotherapy and suction. Bronchoscopy may be required to remove large particulate matter. Secondary infection may occur, and prophylactic antibacterial drugs are sometimes given, CPAP or IPPV with PEEP may be required in severe cases, and mortality is high.

Pre-eclampsia is defined as hypertension presenting after 20 weeks gestation with significant proteinuria (spot urinary protein: creatinine ratio >30 mg/ mmol or a 24-h urine collection with >300 mg protein). It is mild-moderate if systolic blood pressure is 140–159 mmHg or diastolic blood pressure is 90–109 mmHg.

Severe pre-eclampsia is defined as: Systolic blood pressure >170 mmHg or diastolic blood pressure >110 mmHg on two or more occasions, with proteinuria >3+ OR • Systolic blood pressure >160 mmHg or diastolic blood pressure >100 mmHg on two or more occasions with any of: headache, visual disturbance, vomiting, subcostal pain, papilledema, clonus (≥ 3 beats), liver tenderness, thrombocytopenia, abnormal liver enzymes, HELLP syndrome (hemolysis, elevated liver enzymes and low platelets).

Pre-eclampsia is a multisystem disease which results from impaired trophoblast cell invasion during early development of the placenta. This results in failure of spiral artery dilatation and eventually placental hypoperfusion and hypoxia. The placenta secretes cytokines and inflammatory mediators into the maternal circulation in response to hypoxia and the result is widespread endothelial damage and organ dysfunction. Proteinuria is evidence of renal endothelial involvement. HELLP is a variant of pre-eclampsia, diagnosed with evidence of hemolysis, ALT levels above 75 IU/L and a platelet count $< 100 \times 10^9/l$.

Eclampsia is at the extreme end of the disease spectrum and is defined as the occurrence of one or more convulsions during pregnancy or the first 10 days postpartum, with two or more of the following features within 24 hours of the convulsions:

• Hypertension • Proteinuria • Thrombocytopenia • Elevated liver enzymes
Pre-eclampsia and eclampsia are now rare causes of maternal mortality (mortality rate of 0.25 per 100,000 deliveries in

the 2011–13 triennial report). However, pre-eclampsia affects 5%–8% of pregnancies and so is a common cause of maternal and fetal morbidity.

Management requires multidisciplinary teamwork and coordination to plan for delivery at an appropriate time. Hospitals have their own protocols for management of severe pre-eclampsia and eclampsia.

- ✓ First line management for hypertension is labetalol. If this fails to control hypertension, or is contraindicated (e.g., in asthma),
- ✓ second line agents are nifedipine or hydralazine. Fluid overload and pulmonary oedema can occur rapidly with severe pre-eclampsia. Total fluid input should be restricted to 80 mL/h and output should be closely monitored via urinary catheterization.
- ✓ Seizure prophylaxis with magnesium should be considered for all patients with severe pre-eclampsia.
- ✓ Magnesium is also the first-choice agent for seizure treatment in eclampsia.
- ✓ Senior anaesthetists should be closely involved in the care of pre-eclamptic patients, providing advice concerning blood pressure control and fluid balance.
- ✓ Individual units may have guidance on invasive blood pressure monitoring. It is advisable to consider this in unstable or obese patients, once two antihypertensive agents are being used or frequent blood samples are required.
- ✓ Epidural analgesia for labor is often recommended in pre-eclampsia, as it can prevent pain contributing to hypertension. Pre-eclampsia can be associated with thrombocytopenia, so check platelet count. Blood pressure rarely falls in true preeclampsia with any RA, but can be managed with phenylephrine as in the non-hypertensive obstetric patient if it does occur. Where RA is not possible or there is

coagulopathy,

- ✓ GA may be required in pre-eclamptic patients for operative delivery, manual removal of placenta or for management of PPH. It is imperative that the hypertensive response to laryngoscopy is ameliorated, as this has been a cause of direct maternal mortality on the past.
- ✓ No agent has been proved to be superior to others.
- ✓ The anesthetist should choose an agent with which they are familiar, e.g., alfentanil, fentanyl, lidocaine, esmolol, labetalol or magnesium.
- ✓ Emergence hypertension may require a further bolus of an appropriate agent.
- ✓ The widespread oedema seen in pre-eclampsia will also affect the airway so anticipate and plan for a difficult airway and expect to need a smaller than usual endotracheal tube.
- ✓ Magnesium potentiates the action of the nondepolarizing muscle relaxants and fasciculations may be reduced following suxamethonium. In most cases,
- ✓ NSAIDs should be avoided as acute kidney injury is often already present.