Alaa hussein ALgobouri (practical anesthesia) forth stage

Hypoxia During Anesthesia

Causes of hypoxia during anesthesia

A. AIRWAY

1. An obstructed airway prevents oxygen from reaching the lungs.

2. The tracheal tube can be misplaced e.g. in the esophagus.

3. Aspirated vomit can block the airway.

B. BREATHING

1. Inadequate breathing prevents enough oxygen from reaching the alveoli.

2. Severe bronchospasm may not allow enough oxygen to reach the lungs nor carbon dioxide to be removed from the lungs.

3. A pneumothorax may cause the affected lung to collapse.

4. High spinal anesthesia may cause inadequate breathing.

C. CIRCULATION

1. Circulatory failure prevents oxygen from being transported to the tissues.

2. Common causes include hypovolemia, abnormal heart rhythm, or cardiac failure.

D. DRUGS

1. Deep anesthesia may depress breathing and circulation.

2. Many anesthetic drugs cause a drop in blood pressure.

3. Muscle relaxants paralyze the muscles of respiration.

4. Anaphylaxis can cause bronchospasm and low cardiac output.

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E. EQUIPMENT

1. Problems with the anesthetic equipment include disconnection or

obstruction of the breathing circuit.

2. Problems with the oxygen supply include an empty cylinder.

3. Problems with the monitoring equipment include battery failure in the oximeter or a faulty probe.

Management of Hypoxia

A – Is the airway clear?

• Are there signs of laryngospasm?

(mild laryngospasm – high pitched inspiratory noise; severe laryngospasm – silent, no gas passes between the vocal cords)

• Is there any vomit or blood in the airway?

Airway obstruction is the most common cause of hypoxia in theatre. Unrecognized inadvertent oesophageal intubation is a major cause of anesthesia morbidity and mortality. An intubated patient who has been previously well-saturated may become hypoxic if the tracheal tube becomes displaced, kinked, or obstructed by secretions. Check the endotracheal tube and - 'If in doubt, take it out.

B - Is the patient breathing adequately?

• Are the chest movements and tidal volume adequate, and symmetrical?

• Listen to both lungs – is there normal bilateral air entry? Are the breath sounds normal?

• Bronchospasm, lung consolidation/collapse, lung trauma, pulmonary edema or pneumothorax may prevent oxygen from getting into the alveoli to combine with hemoglobin.

• Drugs such as opioids, poorly reversed neuromuscular blocking agents or deep volatile anesthesia may depress breathing. A high spinal anesthetic may paralyze the muscles of respiration. An infant's stomach distension from facemask ventilation may splint the diaphragm and interfere with breathing.

Aadhaiwal

• The treatment should deal with the specific problem.

C - Is the circulation normal?

• Feel for a pulse.

• Check the blood pressure.

• Check the peripheral perfusion and capillary refill time.

• Observe for signs of excessive blood loss in the suction bottles or wound swabs.

• Is anesthesia too deep? Is there a high spinal block?

• Is venous return impaired by compression of the vena cava (gravid uterus, surgical compression)?

• Is the patient in septic or cardiac shock?

Normally inadequate circulation is revealed by the pulse oximeter as a loss or reduction of pulsatile waveform or difficulty getting a pulse signal.

D – Drug effects

Check that all anesthesia drugs are being given correctly.

• Excessive halothane (or other volatile agents) causes cardiac depression.

• Muscle relaxants will depress the ability to breathe if not reversed adequately at the end of surgery.

• Opioids and other sedatives may depress breathing.

• Anaphylaxis causes cardiovascular collapse, often with

bronchospasm and skin flushing (rash). This may occur if the

patient is given a drug, blood, or artificial colloid solution that they are allergic to. Some patients are allergic to latex rubber.

Aaa najwa

In anaphylaxis: what is the management?

1. Stop administering the causative agent.

2. Administer 100% oxygen .

3. Give intravenous saline starting with a bolus of 10ml/kg .

4. Administer adrenaline and consider giving steroids .

5. Bronchodilators and an antihistamine.

E - Is the equipment working properly?

• Is there a problem with the oxygen delivery system to the patient?

• Check for obstruction or disconnection of the breathing circuit or tracheal tube.

• Check that the oxygen cylinder is not empty.

• Check that the central hospital oxygen supply is working properly.

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