SNS COLLEGE OF ALLIED HEALTH SCIENCES

SNS Kalvi Nagar, Coimbatore - 35

Affiliated to Dr MGR Medical University, Chennai

DEPARTMENT : OPERATION THEATRE AND ANAESTHESIA TECHNOLOGY

COURSE NAME : PHARMACOLOGY

UNIT : INHALATIONAL GASES

TOPICS : GASES - O2, N2O, AIR

INHALATIONAL GASES

- Inhalational gases, also known as inhalation anesthetics or volatile anesthetics, are substances that are administered through inhalation to induce and maintain general anesthesia during surgical or medical procedures.

- These gases are designed to cause a reversible loss of consciousness and sensation, allowing patients to undergo procedures without experiencing pain or awareness.

OXYGEN

Role in Inhalational Gases:

- Oxygen is not an inhalational anesthetic itself but is critical for sustaining life and supporting aerobic metabolism.

- It is used as a carrier gas for other inhalational anesthetics and serves as the primary gas for oxygen therapy.

Mechanism of Action:

- Oxygen is essential for cellular respiration, providing the necessary substrate for energy production.

Administration:

- Administered through various devices, including masks, nasal cannulas, and endotracheal tubes.

- Used in various medical settings, including anesthesia, intensive care, and emergency medicine.

Clinical Considerations:

- Oxygen concentration is closely monitored to prevent hypoxia.
- Oxygen therapy is used to improve oxygenation in conditions such as respiratory failure, surgery, or trauma.

NITROUS OXIDE (N2O)

Role in Inhalational Gases:

- Nitrous oxide is an inhalational anesthetic gas with both analgesic and weak anesthetic properties.
- Commonly used in combination with other inhalational or intravenous anesthetics to achieve balanced anesthesia.

Mechanism of Action:

- Acts as a non-competitive antagonist at N-methyl-D-aspartate (NMDA) receptors, contributing to its analgesic effects.

- Potentiates the effect of other anesthetic agents.

Administration:

- Administered through inhalation via a mask or during the induction and maintenance phases of anesthesia.

- It has a rapid onset and offset, making it suitable for short and intermediate procedures.

Clinical Considerations:

- Nitrous oxide has a low blood-gas solubility, allowing for a quick recovery after discontinuation.

- It is commonly used in dental procedures, minor surgeries, and as an adjunct to other anesthetic agents.

AIR

Role in Inhalational Gases:

- Air is used as a carrier gas or diluent for other inhalational anesthetics, especially nitrous oxide.

- It helps control the inspired oxygen concentration when combined with nitrous oxide.

Composition:

- Approximately 78% nitrogen, 21% oxygen, and trace amounts of other gases.

Administration:

- Administered in combination with nitrous oxide or other inhalational anesthetics.

- Used to achieve the desired inspired oxygen concentration and balance the gas mixture during anesthesia.

Clinical Considerations:

- The composition of air can be adjusted to achieve the desired inspired oxygen concentration.
- It is used in various surgical and medical procedures as a carrier gas.

TECHNICIAN ROLE

Gas Monitoring:

- Continuous monitoring of inspired and expired gas concentrations to ensure adequate oxygenation and prevent hypoxia.

- Monitoring devices measure end-tidal carbon dioxide (EtCO2) and inspired/expired oxygen concentrations.

Patient Monitoring:

- Continuous monitoring of the patient's respiratory rate, heart rate, blood pressure, and oxygen saturation.

- Anesthesia providers adjust the concentrations of gases based on individual patient needs and procedure requirements.

ASSESSMENT

- What is the Administration of Oxygen ?
- What is the Role of Air in Inhalational gases ?