Pharma anesthesia

Theories: stimulation for GABA or inactivation if glutamate and nicotinic Ach receptors.
4 stages of anesthesia.
Classified into 2 groups according to the route of administration: 1)inhaled 2)IV.
Inhaled anesthesia:

1. halogenated (-thane)/ methoxyflurane —> nephrotoxicity.
2. non-halogenated (NO).

MOA for general anesthesia:

- Reversible loss of consciousness.
- Amnesia.
- Immobility and analgesia.

The most important characteristics of inhaled anesthetic drugs are:

1. **Solubility in blood (blood: gas partition co-efficient) indicator for induction and recovery rate.**
   ⬇️ blood:gas co-efficient —> faster induction and recovery (NO).
   ⬆️ blood:gas co-efficient —> slower induction and recovery (Halothane).
   NO>isoflurane>Enflurane>halothane.
1. **Solubility in fat indictor for potency:**
   - **(oil: gas partition co-efficient):** 1)Blood:gas partition co-efficient 2) Blood: brain partition co-efficient / and directly proportional with lipid solubility.
   - **MAC:** the minimum concentration of drug in alveolar air that will produce immobility in 50% of patients exposed to painful stimuli / the lower MAC the higher potency. NO(higherMAC thus lowest potency)>ether>enuflurane>isoflurane>halothane(lower MAC thus highest potency).

Pharmacokinetics:
■ at equilibrium: the tension of gas is equal in inspired and alveolar air, arterial and venous blood and body tissues.
■ metabolism: <10% by the liver and 90% by expired air except halothane 40% metabolized by the liver.
■ Elimination: via lungs.
Malignant hyperthermia:

- with halothane , isoflurane and desflurane.
- Treated with DENTEOLENE to inhibit Ca++ transport.

Nitric Oxide (NO):
Safe / good analgesic but weak anesthetic.
SEs: bone marrow depression with prolonged use / 20% of O2 is always needed / diffusion hypoxia.

Halothane (prototype):

Preferred in asthmatic patients(dilates bronchus) / weak analgesic but STRONG anesthetic thus co-administered with opioids.

SEs: atropine sensitive thus bradycardia, hypotension / halothane hepatitis and malignant hyperthermia.

Enflurane:

Contraindicated in epilepsy (seizures in high doses).

Isoflurane:

Irritate respiratory system (depression) / more pungent than halothane.

Desflurane:

Day care surgery / fast recovery / cognitive impairment is shortly lived.

SE: malignant hyperthermia , cough and laryngeospasm.

Methoxyflurane:

Used in child birth.

IV anesthetics:

Thiopental:

Ultra short acting and potent barbiturates

Rapid transfer / laryngospasm not for asthma and porphyria / used for rapid control of seizures.

Etomidate:

Surpasses the synthesis of steroids from adrenal gland / CVS stability / does not increase ICP.

Ketamine:

Can increase ICP / psychotic reaction analogue for phenolcyclidine / emergence delirium, hallucinations and involuntary movement occurs in 50% cases furing recovery / dangerous for HTN and IHD.

Propfol:

Most commonly used IV anesthetic/ anti-emetic action.

Anesthetic Adjuvants:

Benzodiazepines and opioids (الهم محاضرتين كاملين مافي داعي ندرسهم من سلايد).