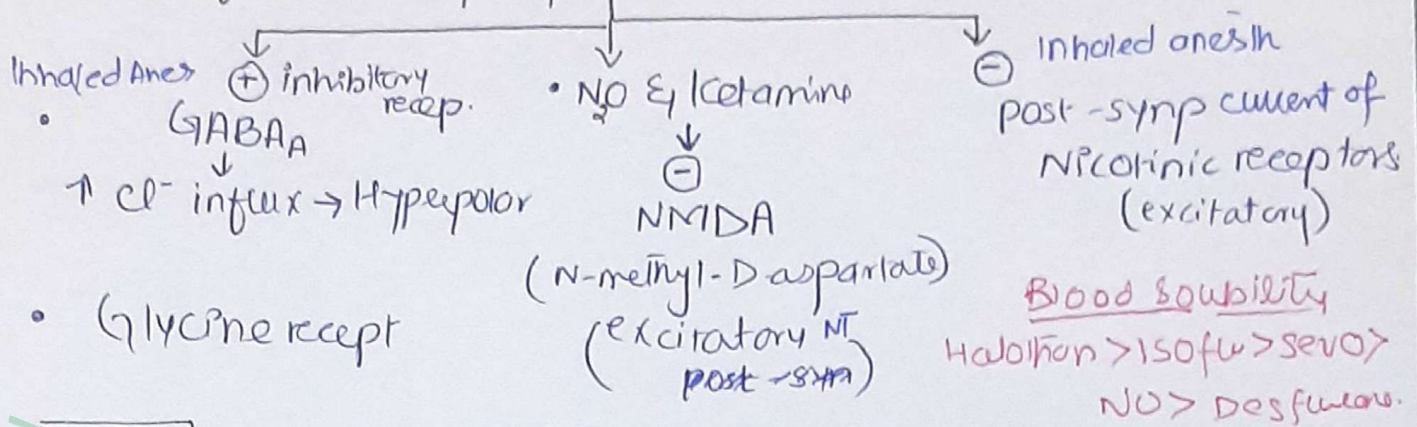
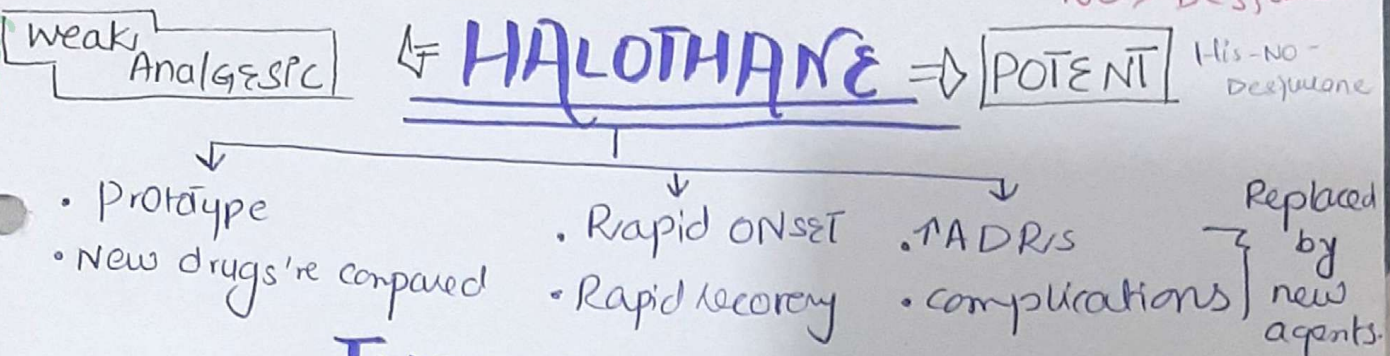


MOA OF ANESTHETICS

- NO specific mechanism/receptors • Appear variety of Mechanisms



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THERAPEUTIC USES

usually co-admin $\bar{e}$ NO, Opioids or local anaesthetics

Bronchodilator

- It is bronchodilator

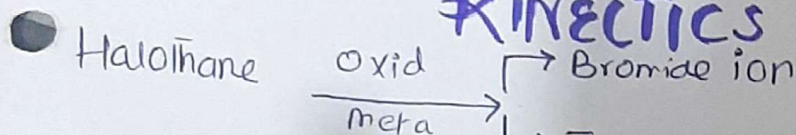
OBSTETRICS

- Relax skeletal & uterine muscles = use in obstetrics

Paeds

NOT Hepatotoxic in children unlike adults, so can be use.

KINETICS



So, To avoid Haloth adm. at interval NLT 2-3 weeks

Begin $\bar{e}$ fever $\rightarrow$ N/V
 $\Leftarrow$ Sign of Hepatitis

ADRS

CARDIAC EFFECTS

- Halog. HC = Vagomimetic $\rightarrow$ Bradycardia (Allopurinol-sensitive)
- Cardiac arrhythm ($\uparrow$ Sensiti to catechol) $\xrightarrow{\text{By}}$
- Conc. dep. Hypotension
- Treat: Direc. Acting Vasoconstrictor Phenylephrine (α_1 -agonist)

MALIGNANT HYPERTHERMIA

- caused by HHC and NM-blockers (Depol.)
- uncontrol ske. mus. oxidative metabolism
- Pt susceptible = Burn victim, Muscle dystroph, myopathy, myotonia, Osteogenesis Imperfecta
- Often inherited as AUTOSOMAL DOMINANT disorder.
- * Dantrolene [Ca^{2+} blocker] $\rightarrow$ $\downarrow$ Heat Relax Muscle cells

ISOFLURANE

ACTIONS:

- Little Metab = NOT toxic to liver & kidney
- NOT induce Cardiac arrhy.
- NOT induce Sensiti to catechol.

ADRS

- Dose-dep. Hypotension
as all HCC does.
- Pungent Odor.
- Stimu. resp. reflexes
[breath holding, salivation, coughing]
Laryngospasm

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NOT USE FOR INHALA INDUCTION.

- With higher blood solubi than desflurane & sevoflurane = Typically use when COST is Factor.

DESFLURANE

PROS

- Rapid ONSET. Rapid recovery due to low blood solubility (least)
- Popular for = OUT-PATIENT PROCEDURE

CONS

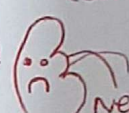
- low volatility & require Sp. heated vapor for adm.
- ↑ Resp. Reflexes ≠ Inhala induce.
- Expensive.

Sevoflurane

PROS

- Rapid onset & induce Recovery (LOW SLOW)
- low pungency
- **Potent (Most)**
- -DOC for paed. Anesthesia

CONS

- Metab. by liver
- comp. formed in anesthesia
- if fresh gas flow is too low. circuit may be  nephrotoxic

NITROUS OXIDE (LAUGHING GAS - N₂O)

PROS

- Non-irritating - potent analgesic weak anesthetic
- Use in combin. at conc. 30-50% & O₂ for analgesia, esp in dentistry
- For Surg. anesth = comb & other potent anesth.
- ⇒ Doesn't: (1) depress respiration
- (2) muscle relax
- (3) effect CVS or use cerebral BF when co-adm & other anesth. or moderate effect
- least hepato toxic and safest if co-adm & O₂

CONS

- ⇒ Least potent
- poorly soluble in blood allowing it to move rapidly in & out of body
- It can ↑ vol or pressure as it replace N₂ faster than N₂ leaves.
- Its speed cause retardation of O₂ uptake during recovery → "Diffusion Hypoxia"
- Manag: signif. conc. of inspired oxygen during recovery

PROPOFOL Pharmaco-study

- I/V Sedative/hypnotic
- use for induction & maintenance
- Has replaced Thiopental
- Now DOC for induction
- poor water solub
- supplied as emulsion containing soyabean oil & egg phospholipid
- MPEK-like appearance

KINETICS: ONSET: 30-40 sec

- Initial Re-distrib $t_{1/2} = 2-4$ min
- Kinetic NOT affected by moderate hep/renal failure.

ACTIONS

- Although ↓ (depress) CNS
- Occasionally causes
 - Muscle twitching
 - yawning
 - Hiccups
 - Spont. muscle movement
- ↓ BP
- ↓ ICP via (vasodilation)
- NOT Analgesic
- Pain at injecti site
- less depressant effect on CNS as comp to volatile anes.
- Some antiemetic effect ↓ ↓ incidence of post opera N/V.

useful in surgeries in which spinal cord junction is monitored.

* - KETAMINE:

- Short-Acting, Non-barbitu. anesthetic induce
- INDUCE ANESTHETIC-STATE (DISSOCIATIVE STATE)
- Stimulate Symp outflow ⇒ ↑ BP ↑ CO
Bronchodilator
- provide
 - unconscious
 - But appear to be awake
 - NOT Feel pain
 - Sedation
 - Amnesia
 - Immobility

⇒ Beneficial in

- Hypovolemic or cardiogenic shock
- Asthmatic

Contraindic

- HT
- stroke pt.

- Lipophilic ⇒ Rapid onset, and distribute like barbitu.

- USEFUL ⇒ CHILD & ADULT = Short procedures.

Abusive potential like phencyclidine (PCP) due to

- Hallucination
- ↑ cerebral BF
- Dream-like state

* ETOMIDATE: - poor H₂O solub = Formulated in propylene glycol soln.

- ONLY Use in pt w CAD or dysfun. heart.
- ADR = ↓ plasma cortisol and ALDOSTERONE upto 8hrs ⇒ NOT give For long duration
- Involun. muscle movem manage by Bz & opioids.

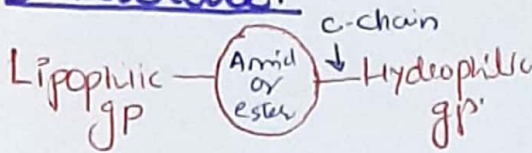
LOCAL ANESTHETICS Pharmaco-study

Block conduction of sensory impulses

At high conc = Block motor

Block Na^+ channels $\rightarrow$ Action Potential $\downarrow$ Signal transmission

Structure:



Delivery Techniques

1. Topical $\rightarrow$ into lower back

2. Infiltration $\rightarrow$ Maxillary area
(infiltrated into deep dermis, where sensory plexus supplying to skin begins to branch)

3. peripheral nerve block (injection near specific nerve)

4. Neural Axial block

Spinal

epidural
(epidural space around spinal cord)

caudal
(Lower back that goes to epidural sp)

MOST-WIDELY USED

Bupivacaine

mepivacaine

Ropivacaine

lidocaine

prilocaine

Tetracaine

cardiotoxic if injected inadvertently

Liposome injectable suspension provide post-surgical

ANALGESIA = 24hr or longer

If taken $\bar{e}$ other anes. then cause early release/immedi of bupivac.

Neonate toxic

Shouldn't USE IN OBSTETRICS

IV-anti-analgesic

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METABOLISM

AMIDE

- primarily in liver
- prilocaine, dental anes. also metabo. in plasma & kidney (one of its metabo. leads to Methemoglobinemia)

ESTER

- Biokinet. by plasma (pseudocholinesterases)
- if hepatic function doesn't signif. $\uparrow$ duration of L-Anes.

ONSET AND DURATION

pH

Nerve morphology

pKa

Lipid solub

Concentration

At physiol. pH, these comp're ionized and interact $\bar{e}$ protein recept of Na^+ to inhibit its function. At infec. sit pH is low

Amid = close to physiol pH
Ester = Higher

$\uparrow$ L.S & conce = $\uparrow$ ONSET

$\uparrow$ Time it stay near recep = $\uparrow$ Duration

ACTION Pharmacology-study

- Causes vasodilation → rapid diffusion away from site
↓
Short duration
 - Duration affected by Re-distribution rather than metabo.
 - Use rate of local absorp & diffusion
 - Use sys. toxicity, ↑ use duration
- Add vasoconstrictor
Epinephrine (1:100,000)
↓

ALLERGIC RX.

- Mostly due to epineph
- Symp of Allergy = urticaria, Edema & Bronchospasm

Amide

- Very rare
- One amide drug allergy NOT cause
= all amide drug/anesth

Ester

- Procain is more allergenic
- Allergy is due to p-amino benzoate which is produce by all esters = SO Allergy = one ester = allergy = all esters

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ADMINI IN CHILD/GERIA

Children
(acc. to weight)

Although response is same in young adult & older But still give less dose due to liver (as epineph is mixed) → CV-problem

"LOCAL-ANES = SAFE FOR PR. SUSCEP TO MH"

Systemic/Local toxicity

- Due to repeated injec.
- Due to inadvertent IV injections
- Systemic toxic = more = Amides

Consider For diagnosis

- Mental status
- CVS (excitatory or depression)

Management

- airway manag
- CPR if needed
- Breathing & circulatory support
- Seizure control