

ANTI-EPILEPTIC DRUGS:

Epilepsy → They are group of disorder of the CNS i.e., paroxysmal electrical dysrhythmia, loss or disturbance of consciousness.

* Types of seizures:

⇒ GENERALIZED

- generalized tonic-clonic seizure (GTCS)
- Absence seizures
- Myoclonic seizures

⇒ FOCAL / PARTIAL

- simple
- complex

Note → GTCS → It is a sequence of event and symptoms of Aura, loss of consciousness, fall to ground, period of Relaxation.

Absence seizure → sudden onset of these symptoms and momentary loss of consciousness.

⇒ Seizures occur due to Abnormal depolarization of neuronal membrane → hypersensitivity of high frequency firing

⇒ Defect in Inhibitory GABA

⇒ excess of excitatory neurotransmitter like Glutamate (NMDA & AMPA)



↓ GABA

↑ Glutamate

CLASSIFICATION:

: AOH

essay

~~10~~ BASED ON STRUCTURAL OR CHEMICALLY

1. Barbiturate - Phenobarbitone
2. Deoxybarbiturate - Primidone
3. Hydantoin - Phenytoin, Fosphenytoin
4. Iminostibene - Carbamazepine, Eslicarbazepine, Ox
5. Succinimide - Ethosuximide
6. Aliphatic carboxylic Acid - Valproate sod, Divalproex
7. Benzodiazepines - Clonazepam, Diazepam, Lorazepam
8. Newer drugs - Topiramate, Levetiracetam, Brivaracetam
Vigabatrin, Piagabine
9. Cyclic GABA Analogues - Gabapentin, Pregabalin
10. Phenylmazine - Lamotrigine safe in pregnancy

BASED ON MOA

1. Inhibition of voltage gated Na channel
 - Block it, causes Repolarisation
 - Phenytoin, carbamazepine, Lamotrigine
 - Zonisamide, Valproate, Topiramate, Lacosamide

~~10~~ VALPROATE (Valproic Acid)

- Broad spectrum Anticonvulsant

- Phenytoin like suppression in therapeutic conc.

MOA:

→ A phenytoin like - frequency-dependent potentiation of Na channel inactivation.

- Weak attenuation of Ca^{2+} mediated 'T' current.
- Enhanced Release of Inhibitory transmitters GABA due to Inhibition of its degradation by GABA-T.
- Blockade of excitatory NMDA glutamate Receptors

PK → Oral Absorption, Met - liver, ex - urine $t_{1/2} = 10-15h$.

ADR

- Anorexia, V, loose motion.
- Alopecia, cooling of hair, weight gain
- Rare → fluminate Hepatitis in children
- teratogenic → spina bifida.

Uses

- DOC for Absence of EPTCS.
- 1st line for focal seizures. - due to good tolerance
- used in myoclonic, atonic seizures.
- Mania, Bipolar illness.
- prophylaxis in migraine.

Interaction:

- Focal Abnormality
- Valproate ↑ plasma level of phenobarbitone

2) Enhancement of GABA Mediated Cl^- channel opening

- Benzodiazepine, Barbiturate

• GABA transaminase (Metabolic GABA Inhibitor)

• Vigabatrin

• GABA uptake transporter GABA-T

- Tiagabine, valproate

3) Blockade of NMDA/AMPA Receptor Glutamate Receptor

→ seizures

NMDA Blocker: Felbamate

AMPA Blocker: Lamotrigine, Topiramate

4) Blockade of T type of Ca-channel:

→ Responsible for Absence seizures

- Ethosuximide, Valproate, Zonisamide

5) selective binding to synaptic vesicular protein: (SV2A)

- Reduce synaptic Release of glutamate

- Levetiracetam, Brivaracetam

6) Blockade of CRMP-2 ()

- Lacosamide

PHENYTOIN:

→ mild sedation

→ most prominent Action is Abolition of tonic phase of maximal electroshock seizures.

MOA

- prolonging the inactivated state of voltage sensitive neuronal Na^+ channel.

↓
high freq discharges are Inhibited.

phenytoin in contrast with phenobarbital and valproate does not interfere with breathing.

- Also depresses presynaptic Release of glutamate Release
- Reduce Ca^{2+} Influx.

↓
Repulsive firing is prevented.

effective in trigeminal neuralgia And Cardiac Arrhythmias.

PC → orally slow,

changes from 1st to 2nd over therapeutic Range (Mixed order)

Plasma con should be monitored

ADIZ

At therapeutic dose - Type A:

- Gum hypertrophy - maint good oral hygiene
↳ due to overgrowth of collagen.

- Hirsutism, Acne
- Hypeosmia
- Megaloblastic Anemia, Osteomalacia.

HHHM
* In preg → fetal hydantoin syndrome

- cleft palate, hardin, Microencephaly
caused by Acene oxide Metabolite

Over dose - toxicity - Type B

- cerebella And vestibular manifestation

- Epigastric pain

- Fall in B.P cardiac arrhythmias.

- Drowsiness, behavioural Alterations,
mental confusion.

Inhibition → Phenyton: inhibit valproic metabolism: _/_/_

Uses:

- focal And GNCs.
- It can Accelerate myoclonic And Absence seizure.
- used when newer drugs are not tolerated.
- for status epilepticus. - phenytoin so it is used when fosphenytoin is not available.
- 2nd choice of in trigeminal neuralgia

CARBAMAZEPINE:

- 1st line for focal s.

MOA → similar to phenytoin. - (1st point) note.

High frequency neuronal discharge are inhibited.

Also Inhibit (kindling)

Plc → orally slow

Met - lines CYP3A4, CYP2C9

ADR

→ neurotoxicity, sedation, dizziness,

NVP

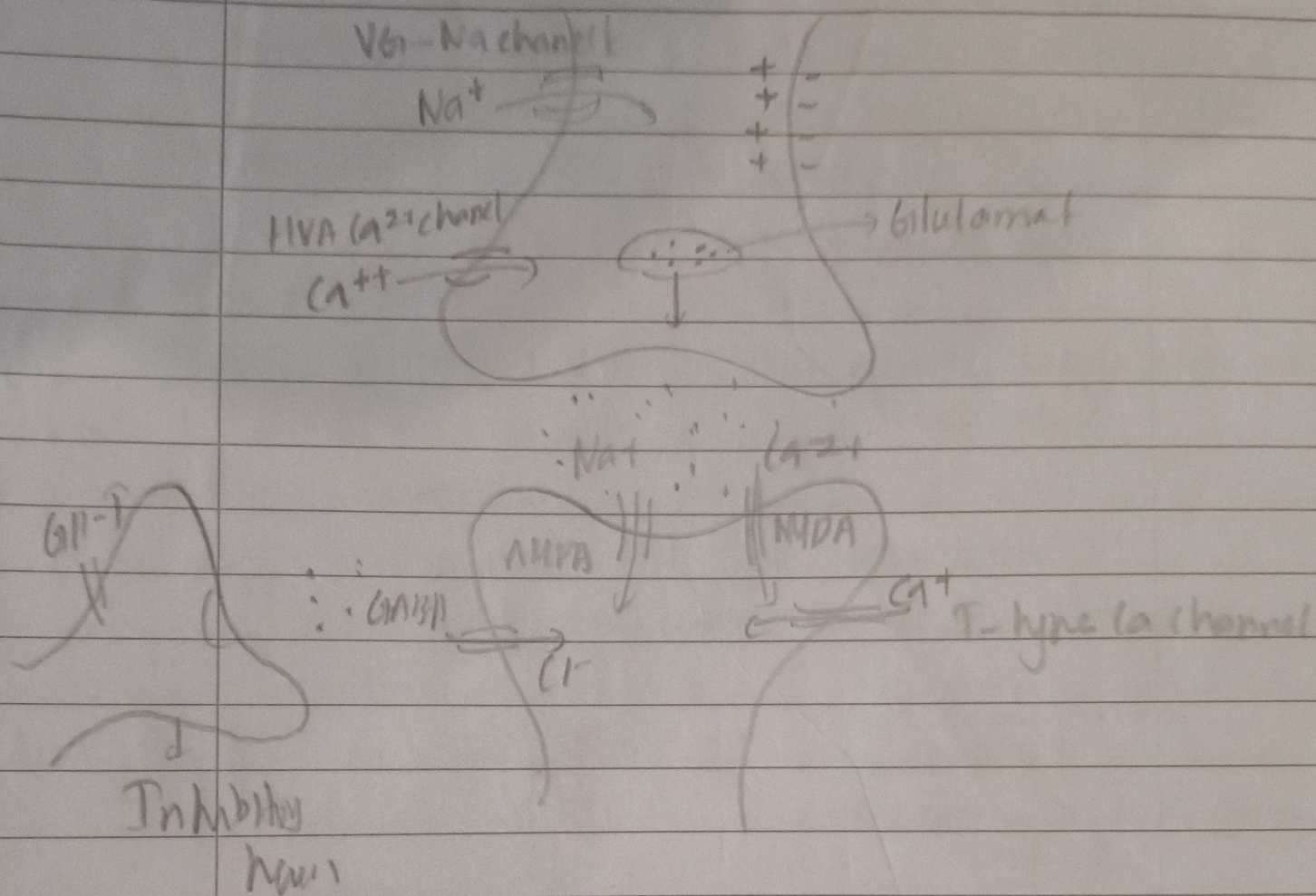
Acute intoxication cause coma, convulsion & VS changes

Hypnatremia, Hyponatremia, fetal malformation.

Uses:

feet, GNCs, Trigeminal Neuralgia,

Manic depressive illness, Acute mania



DIAZEPAM:

not used long term due to tolerance action.

1st line for emergency control of convulsion, Eclampsia, tetanus.

0.2-0.3 mg/kg slow iv.

HGA → facilitation of GABA mediated Cl⁻ channels.

ADR → thrombophelia, BP↓, Resp depression

Reckal instillation of diazepam gel.

NOTE → Lorazepam cause less ADR than this drug.