

EXPERIMENT NO.: 12

DATE:

**AIM: TO STUDY THE ANTI CONVULSIVE OR ANTIEPILEPTIC ACTIVITY OF DRUG USING MAXIMUM ELECTROCONVULSIVE SHOCK SEIZURE (M. E. S) AND CHEMICAL INDUCE (PENTYLENETETRAZOL - PTZ) CONVULSIONS METHODS.**

**Requirement:** Electro convulsimeter, Electrode (Eye or Ear), Stop watch.

**Animal:** Rat or Mice

**Drugs:** Pentylenetetrazol (Leptazole 80 mg/kg),

Phenytoin (100 mg/kg),

Trimethadione (40 mg/kg),

Saline.

**Principle:**

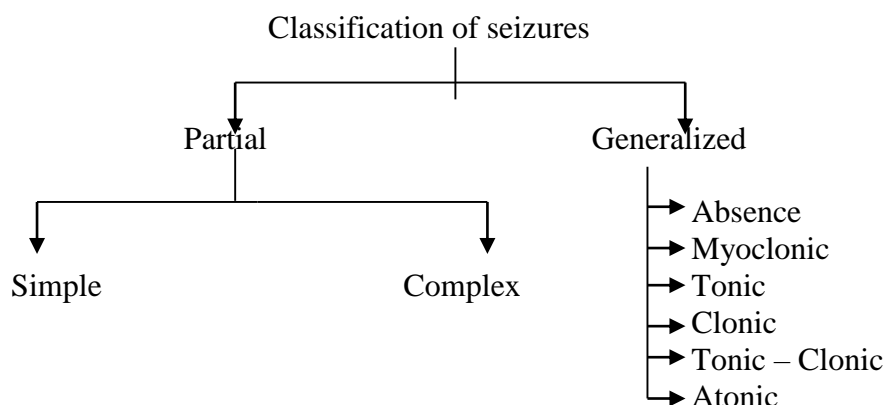
The convulsion in rat and mice can be induced by giving high voltage current near the brain or by suitable CNS stimulants (Eg. Pentylenetetrazol). The screening of antiepileptic agents can be done by experimentally induced convulsion (Seizures) and their prevention by drug under test.

**Theory:**

**Epilepsy:** “These are group of disorders of the CNS characterized by paroxysmal cerebral dysrhythmia manifesting as brief episodes of the loss of consciousness with or without characteristic body movement, sensory or psychiatric phenomenon.”

- Epilepsy has a focal origin in the brain.
- Epilepsy is derived from the greek word meaning “to seize upon” or “taking hold of”

**Seizures:** These are sudden alterations in behaviour or motor function caused by an electrical discharge from the brain.



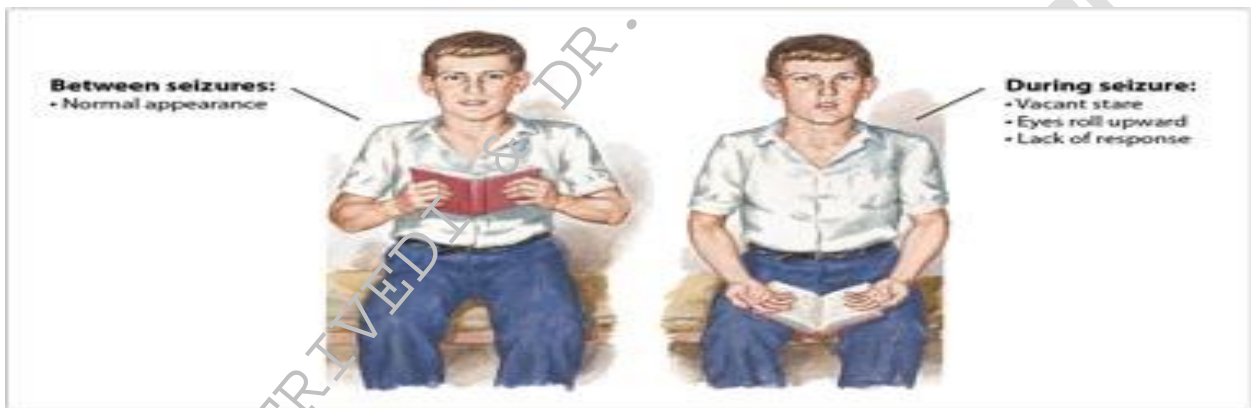
1. **Partial seizures:** Seizure arises from specific area of one side of brain.

Partial seizures are subdivided between simple and complex partial seizures, which are distinguished by the presence or absence of impairment of consciousness.

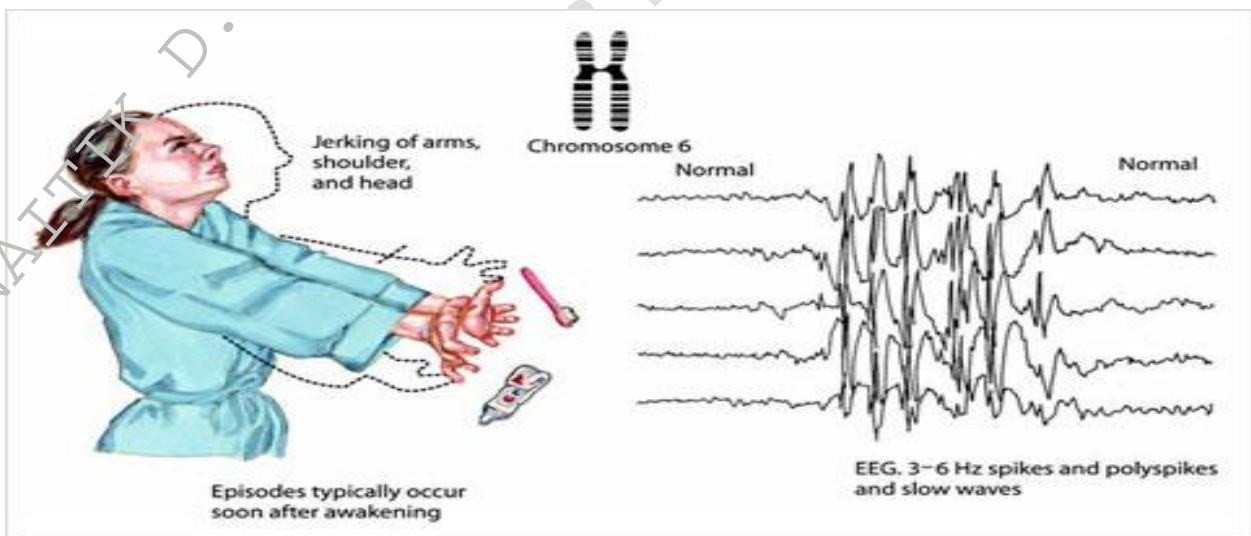
- Simple partial seizures are defined as seizures without impairment of consciousness
- Complex partial seizures are defined as seizures with impairment of consciousness

2. **Generalized:** throughout all areas of both sides of brain

- **Absence seizure (petit mal):** patients seem to lose concentration, stare and fluttering of eyelids for a while, mistaken for day dreaming, in children.



- **Clonic ( myoclonic):** Alternate contraction and relaxation, jerking.



- **Tonic :** Muscular contraction
- **Atonic :** Relaxation, flaccid paralysis



- **Tonic- clonic (grandmal):** strong contraction of musculature- Resp. stops, salivation often occur- tonic phase lasts for 1 min- followed by violent, jerks upto 2-4 min.

➤ **Drug used to treat epilepsy are classify as:**

- |                              |                                     |
|------------------------------|-------------------------------------|
| 1. Barbiturates              | Phenobarbitone, Mephobarbitone      |
| 2. Deoxybarbiturate          | Primidone                           |
| 3. Hydantoin                 | Phenytoin                           |
| 4. Iminostilbenes            | Carbamazepines                      |
| 5. Succinimides              | Ethosuximide                        |
| 6. Aliphatic carboxylic acid | Valproic acid                       |
| 7. Benzodiazepines           | Clonazepam, Diazepam                |
| 8. Newer agents              | Lamotrigine, Gabapentin, Vigabatrin |
| 9. Miscellaneous             | Phenacetamide, Acetazolamide        |

**Procedure:**

**a) Maximum Electro convulsive seizure (MES):**

- The rat weight 150-250 gm or mice weight 20-40 gm are used in the experiments.
- The animals are first tested by giving maximum current 150mA in rat and 80mA in mice for 0.2 sec.
- Those animals which shows characteristics course of convulsion are selected.
- Then the selected rat or mice of either sex are randomly divided in to two groups as control and test. Each group consist six animals.
- The control group is administered with saline solution and the test group is administered with Phenytoin (100 mg/kg).

- Then gives produce the convulsion by giving maximum electroconvulsive shock in mice 80mA and in rat 150 mA for 0.2 sec through the electrode place on ear pinna.
- Record the reading for Clonic convulsion, Straub tail, Tonic convulsions, Stupor and Recovery for control and test groups of animal.

**b) Chemical methods:**

- The animals are injected with Leptazole (80 mg/kg, i.p).
- Those animals which shows characteristics course of convulsion are selected.
- Then the selected rat or mice of either sex are randomly divided in to two groups as control and test. Each group consist six animals.
- The control group is administered with saline solution and the test group is administered with Phenytoin (25 mg/kg, i.p).
- The Leptazole (80 mg/kg, i.p) administered and the time taken for the convulsion to start is note.
- Picrotoxin (6-7 mg/kg) may also be used instead of Leptazole to produce convulsion.

**Observation and Results:**

**1) Reading of control group animal is:**

- Clonic convulsion : 13 sec.
- Straub tail : present.
- Tonic conculsions : 0.8 sec
- Stupor : 120 sec
- Recovery

**2) Reading of test group animal is:**

- Clonic convulsion : 0.6 sec.
- Straub tail : absent
- Tonic conclusions : 0.4 sec
- Stupor : 50 sec
- Recovery

**Observation table:**

**Effect of Phenytoin on the electrically induced convulsion in mice**

Sr. no	Treatment	Time (in Sec) of different phase of seizure			
		Tonic	Clonic	Stupor	Recovery/ death
1	Saline (0.2 ml)	13	08	120	Recovery
2	Saline (0.2 ml)	12	06	125	Recovery
3	Saline (0.2 ml)	10	07	110	Recovery
4	Saline (0.2 ml)	13	09	130	Recovery
5	Saline (0.2 ml)	14	08	124	Recovery
6	Saline (0.2 ml)	12	06	120	Recovery
7	Phenytoin (100mg/kg)	06	03	50	Recovery
8	Phenytoin (100mg/kg)	05	04	45	Recovery
9	Phenytoin (100mg/kg)	07	03	55	Recovery
10	Phenytoin (100mg/kg)	06	05	60	Recovery
11	Phenytoin (100mg/kg)	05	03	62	Recovery
12	Phenytoin (100mg/kg)	06	02	65	Recovery

**Discussion:**

- Epilepsy is synchronous discharge of impulses from brain characterized by ora (noice), cry, tonic and clonic convulsion. There is spontaneous occurrence of brief episodes associated with disturbance in consciousness and excessive ECG spike.
- It is characterize that a drug showing prevention against electrically induced convulsion are effective in Grand-mal epilepsy in human beings and those drugs which prevent only chemically induced convulsion are effective therapeutically in petit mal epilepsy.

**TEACHER'S SIGNATURE**