



EPILEPSY

## DEFINITIONS

- Epilepsy is a neurological disorder in which nerve cell activity in the brain is disturbed causing seizures.
- It is characterised by recurrent seizures with or without loss of consciousness.
- **Seizure:** seizure is a sudden, excessive, abnormal hypersynchronous discharge of cerebral neurons.
- A pattern of Repeated seizures is referred as **epilepsy**.
- During seizure, a person experience abnormal behavior, symptoms and sensations.

- Seizures involve disturbances of neuronal electrical activity which interferes with the normal brain functions.
- These abnormal discharges may occur at a specific part of brain or may spread extensively throughout the brain.
- **Convulsions:** involuntary, violent and spasmodic contractions of muscle due to abnormal or electrical activity is called convulsions (repetitive jerking of muscles).

## **ETIOLOGY**

- Genetic
- Stroke
- Brain tumor
- Brain infection
- Traumatic brain injury
- Loss of oxygen to the brain
- Alcoholism

## **SYMPTOMS**

- Periods of vigorous shaking
- Nearly undetectable spells.

## PATHOGENESIS

- Normally, there is a balance between excitatory post synaptic potential (EPSP) and inhibitory post synaptic potential (IPSP).
- EPSP's- Acetylcholine, glutamate.
- IPSP's- Gamma Amino butyric acid (GABA).
- EPSP'S- generation of nerve impulse.
- IPSP'S- inhibition of action potential or nerve impulse.
- In epilepsy, there is a imbalance EPSP'S and IPSP'S that leads to seizures.
- In seizures, there is a increased EPSP'S and decreased IPSP'S.

- Increased EPSP'S is due to Na influx and Ca influx which leads to seizures.
- This can be entackled by K influx and cl influx
- Abnormal function of ion channels and neural networks can result in rapid, uncontrolled spread of electrical activity that forms seizures.

Seizures are of various types:

- **Partial seizures**
- Simple
- Complex
- **Generalized seizures**
- Tonic
- Atonic
- Tonic clonic seizure (grandmal)

- Absence seizure ( Petit mal seizure)
- Myoclonic
- Infantile
- Febrile seizures

### Simple partial seizure

- A partial (focal) seizure happens when unusual electrical activity affects a small area of the brain. When the seizure does not affect awareness, it is known as a simple partial seizure.
- Simple partial seizures can be: Motor - affecting the muscles of the body.

## Complex seizures

Complex partial seizures refer to focal seizures that start in one hemisphere of the brain and are associated with impairment in consciousness.

## Tonic seizures

Seizures with stiffening of muscles

## Atonic seizures

- Atonic seizures are a type of seizure that causes sudden loss of muscle strength.
- These seizures are also called akinetic seizures, drop attacks or drop seizures.
- The sudden lack of muscle strength, or tone, can cause the person to fall to the ground.



## Tonic clonic seizures

- A type of seizure that involves a loss of consciousness and violent muscle contractions.
- Stiffening, falling and jerking can be seen.

## Myoclonic seizures

- Myoclonic seizures are brief shock-like jerks of a muscle or group of muscles.
- During a myoclonic seizure, the person is usually awake and able to think clearly.

## Infantile seizures

- Infantile spasms (IS) is a seizure disorder in babies.
- The seizures (or spasms) make muscles in the arms and legs stiff and bend the baby's head forward.

## Febrile seizures

- A febrile seizure is a convulsion in a child caused by a spike in body temperature, often from an infection.
- 6 months- 6 years of age child.

## Status epilepticus

- Status epilepticus (SE) is a medical emergency associated with significant morbidity and mortality.
- SE is defined as a continuous seizure lasting more than 30 min, or two or more seizures without full recovery of consciousness between any of them.

## **DIAGNOSIS**

- Electroencephalogram (EEG).
- MRI
- Physical and neural examination

## **TREATMENT**

Use of anti- epileptic drugs

Medication	Indications (seizure type)	Most common oral side effects and dental considerations
Phenobarbital	Partial and secondarily generalized	Drowsiness/sedation, osteopenia/osteomalacia
Carbamazepine	Partial and secondarily generalized	Xerostomia, stomatitis, gingival bleeding, rash, osteopenia/osteomalacia
Phenytoin	Partial and secondarily generalized	Gingival hyperplasia, gingival bleeding, osteopenia/osteomalacia
Valproate or valproic acid	Partial and generalized	Gingival bleeding, petechiae, decreased platelet aggregation
Primidone	Partial and generalized	Drowsiness/sedation
Lamotrigine	Partial and generalized	Rash
Topiramate	Partial and generalized	Mild cognitive side effects
Clobazam	Partial and generalized	Drowsiness/sedation
Oxcarbazepine	Partial and secondarily generalized	Unknown
Ethosuximide	Generalized	Drowsiness/sedation
Vigabatrin	Partial	Unknown
Lorazepam	Generalized	Drowsiness/sedation
Diazepam	Generalized	Drowsiness/sedation
Gabapentin	Partial	Drowsiness/sedation
Levetiracetam	Partial and generalized	Unknown

