



## SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

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### 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.

**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**

#### **Anti-epileptic drugs**

- Phenytoin
- Phenobarbital
- Carbamazepine
- Sodium valproate
- Primidone
- Lamotrigine
- Topiramate
- Clobazam
- Gabapentin
- Levetiractem