
UNDERSTANDING EPILEPSY

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ABSTRACT

Epilepsy is a chronic neurological condition marked by a tendency to experience repeated, unprovoked seizures due to abnormal electrical activity in the brain. These seizures can vary widely, affecting movement, sensation, behavior, or awareness, and their severity and frequency differ from person to person. Epilepsy can arise from genetic factors, structural brain changes, injury, or remain of unknown cause, and is managed through a combination of medication, lifestyle adaptations, and in some cases, surgical interventions. This condition affects people of all ages and requires individualized care to minimize seizures and enhance quality of life. The purpose of this article is to spread awareness for epilepsy and educate readers about the condition.

I. INTRODUCTION

What is epilepsy?

Epilepsy is one of the most common neurological disorder.

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According to WHO between 4 to 10 people out of every 1000 has active epilepsy and this number goes upto 6 to 10 people in INDIA according to the recent reports.

The purpose of this article is to spread awareness for epilepsy and educate readers about the condition.

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This condition affects people of all ages and requires individualized care to minimize seizures and enhance quality of life.

The brain is composed of billions of cells called neurons, they release electrical impulses which send messages that tell other parts of the body what to do.

If a person has epilepsy some neurons may fire rapidly and randomly send many messages at the same time which overwhelms the brain and causes seizures.

Differences Between Epileptic and Non-Epileptic Seizures

* Brain Activity*:

Epileptic - Abnormal electrical activity in the brain, can be detected on an EEG.

Non-Epileptic - EEGs typically show no such activity.

Triggers:

Epileptic - Sleep Deprivation, Stress and Anxiety, Photosensitivity.

Non-Epileptic - Psychological factors or physical conditions.

II. TYPES OF SEIZURES

Partial or Focal Seizures

These type of seizures happens in a limited are of the brain.

Partial seizures are subdivided into -

1. Simple partial seizures

Depending on the affected brain area patients may have unusual feelings, strange sensations or uncontrollable jerky movements but remain conscious and aware of the surroundings.

2. Complex partial seizures

It involves a loss or changes in consciousness, awareness and responsiveness.

* Generalized seizures*

These type of seizures happens in the entire brain.

Generalized seizures are subdivided into -

1. Absence seizures

This type occurs most often in children and is characterized by a very brief loss of awareness commonly manifested as a blank stare with or without subtle body movements such as lip smacking or eye blinking.

2. Tonic seizures

These are associated with stiffening of muscles or increased muscle tone and may cause person to fall, often backwards.

3. Atonic seizures

Also known as drop attacks, on the other hand, are characterized by a sudden loss of muscle tone, which may cause person to collapse or fall down.

4. Clonic seizures

These are associated with rhythmic jerking muscle movements. Most commonly affected are the muscles of the neck, face, arms and legs.

5. Myoclonic seizures

These are the sudden brief jerks or twitches of muscles. Patients typically reacts as if they hit by a jolt of electricity.

6. Tonic clonic seizures

These are also known as convulsive seizures. These are mixture of muscle stiffening and jerking. It also involves sudden loss of consciousness and sometimes loss of bladder control.

III. CAUSES OF EPILEPSY

1. Acquired

- . Brain injury
- . Brain tumor
- . Brain stroke
- . Previous infection
- . Birth defects

2. Genetics

- . Single gene mutation (it is rare)
- . Multiple gene and environmental factors often responsible
- . >200 genes: GABA receptors ion channels
- . Genetic disorder: Down Dravet, Angel man.

Risk factors

- . Autism
- . Cerebral palsy
- . Mental retardation
- . Migrational abnormalities of brain
- . Tuberous sclerosis
- . Family history

Symptoms of Epilepsy

1. Simple focal seizures

- . Dizziness

- . Change in sense of smell, taste, sound
- . Twitching of limb
- . Jerking of body parts such as arm or leg.
- 2. Complex focal seizures
 - . Unresponsiveness to the environment
 - . Staring blankly into space
 - . Performing repetitive movements such as hand rubbing, walking in circles.
- 3. Tonic Seizures
 - . Muscle stiffness(muscle in back, neck and arm).
- 4. Atonic seizures
 - . Loss of muscle control that can lead to sudden collapse.
- 5. Absence seizures
 - . Subtle body movements such as blinking and staring into space.
- 6. Clonic seizures
 - . Rhythmic or repeated jerky muscle movements of face, neck and arm muscles.
- 7. Myoclonic seizures
 - . Twitches of the arm and leg.
- 8. Tonic clonic seizures
 - . Stiffening of the body, shaking, loss of consciousness.

IV. DIAGNOSIS

Diagnosing epilepsy is not always easy and there can be a lot of variation in the diagnostic process. The doctor, often starting with your GP, will usually consider the person's background and medical history, then conduct a physical examination. As well as refer them for tests and investigations, to assess the type of seizures. Tests and investigations that are often used to diagnose epilepsy includes:

- . Physical examination
- . Pathology tests: Blood tests are usually ordered
- . Electroencephalogram(EEG): Records electrical activity in the brain
- . Computed tomography(CT): Looks for abnormalities or damage to the brain
- . Magnetic resonance imaging(MRI): Provides more detailed images of the brain

V. TREATMENT OF EPILEPSY

There is no cure for epilepsy but various treatments are available to control seizures.

1. Medications:

Medication successfully control seizures for about 70% of the cases. Many anti-epileptic drugs are available which target sodium channels, GABA receptors, and other components involved in neuronal transmission.

Different medicine helps with different types of seizures.

2. Dietary Therapy:

Ketogenic diet has been shown to reduce or prevent seizures in many children who do not respond to medications. Ketogenic diet is a special high-fat, low-carbohydrate diet that must be prescribed and followed strictly.

3. Vagus nerve stimulation:

A device is placed under the skin acts as a pacemaker to the brain and stimulate the vagus nerve at a certain rate.

4. Finally a surgery may be performed to remove part of the brain that causes seizure. This is usually done when tests show that seizures are originated from a small area that does not have any vital function.

VI. CONCLUSION

Epilepsy is a complex condition that requires a well-rounded approach to diagnosis, treatment, and management. By understanding the various aspects of epilepsy, we can better support those affected by it and work toward reducing the stigma often associated with the condition. With proper medical care, lifestyle adjustments, and a supportive network, many people with epilepsy lead full and rewarding lives.

VII. REFERENCES

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