

EPILEPSY



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

By

Ms. RUPALI RUPASMITA ROUT
ASSISTANT PROFESSOR

INTRODUCTION:

Epilepsy is a neurological disorder characterized by recurrent, unprovoked seizures. Seizures are caused by abnormal electrical activity in the brain, leading to temporary disruptions in brain function.

ETIOLOGY:

- **Genetic factors:** Epilepsy can be caused by genetic mutations or inherited from family members who have epilepsy. Certain genes have been associated with an increased risk of epilepsy, although the genetic causes of epilepsy are complex and not fully understood.
- **Brain injuries:** Traumatic brain injuries, such as those resulting from accidents, falls, or sports-related injuries, can cause epilepsy. These injuries disrupt the normal functioning of the brain and may lead to the development of epilepsy in some cases.
- **Brain tumors:** Benign (non-cancerous) or malignant (cancerous) tumors in the brain can disrupt normal brain activity and trigger seizures, leading to epilepsy. Tumors can directly press on or infiltrate brain tissue, leading to changes in electrical activity that can result in seizures.
- **Infections:** Certain infections that affect the brain, such as meningitis, encephalitis, or brain abscesses, can cause inflammation and scarring in the brain, which can increase the risk of developing epilepsy.
- **Developmental disorders:** Some developmental disorders, such as autism spectrum disorder, neurofibromatosis, or Down syndrome, have been associated with an increased risk of epilepsy. The exact mechanisms underlying this association are not fully understood, but it is believed to involve disruptions in brain development.
- **Stroke and vascular disorders:** Strokes, which occur when blood flow to a part of the brain is disrupted, can cause damage to brain tissue and increase the risk of epilepsy. Other vascular disorders, such as arteriovenous malformations (AVMs) and cerebral venous sinus thrombosis, can also cause epilepsy.

- **Metabolic and genetic disorders:** Certain metabolic and genetic disorders, such as mitochondrial disorders, metabolic encephalopathies, or Rett syndrome, can affect brain function and increase the risk of epilepsy.
- **Drug and alcohol withdrawal:** Withdrawal from certain drugs or alcohol can trigger seizures in some individuals, which may lead to the development of epilepsy.

PATHOPHYSIOLOGY:

- Epilepsy is a neurological disorder that is characterized by abnormal electrical activity in the brain, leading to recurrent seizures.
- The brain communicates through electrical signals generated by neurons.
- These electrical signals are responsible for transmitting information throughout the brain and controlling various bodily functions.
- In a healthy brain, there is a delicate balance between excitatory and inhibitory signals that regulate the normal functioning of the brain.
- During a seizure, there is a sudden and abnormal burst of electrical activity in the brain, leading to a disruption of normal brain function.
- This burst of activity can occur in a specific area of the brain (called a focal or partial seizure) or involve the entire brain (called a generalized seizure).
- The exact trigger for this abnormal electrical activity is often unknown, but it can be related to various factors such as genetic mutations, brain injuries, infections, tumors, or other underlying conditions.

CLINICAL MANIFESTATION:

- **Seizures:** Seizures may involve loss of consciousness, uncontrolled movements (convulsions), staring spells, repetitive movements, abnormal sensations, or altered behavior.
- **Aura:** Some individuals with epilepsy may experience an "aura" before a seizure, which is a warning sign or sensation that precedes the seizure. Auras can include visual disturbances, auditory hallucinations, strange smells or tastes, or other sensory or emotional changes.
- **Confusion or memory problems**
- **Emotional changes**

- **Physical injuries:** Seizures can sometimes result in physical injuries, such as falls, injuries from convulsions, or biting the tongue or cheek during a seizure.
- **Autonomic symptoms:** Certain types of seizures may also cause autonomic symptoms, such as sweating, flushing, changes in heart rate or blood pressure, or gastrointestinal symptoms.

DIGNOSIS:

Electroencephalogram (EEG): This test measures the electrical activity of the brain through electrodes placed on the scalp. An EEG can help identify abnormal patterns of brain activity that may suggest epilepsy.

Video-EEG monitoring: This combines an EEG with video recording of the individual's behavior during the test. It allows for simultaneous recording of brain activity and seizure behavior, which can help in identifying the type and origin of seizures.

Magnetic Resonance Imaging (MRI): This is a type of imaging test that uses magnetic fields and radio waves to create detailed images of the brain. An MRI can help identify structural abnormalities in the brain, such as tumors, scars, or other lesions that may be causing seizures.

Blood tests: Blood tests may be performed to rule out other possible causes of seizures, such as metabolic or infectious conditions.

Neuropsychological testing: These tests evaluate cognitive and behavioral function, and can provide valuable information about the individual's cognitive abilities, memory, language skills, and emotional state.

Seizure diary: Keeping a detailed diary of seizure events, including the type, duration, triggers, and associated symptoms, can provide important information for the diagnosis and management of epilepsy.

Provocative testing: In some cases, a healthcare professional may use specific techniques to trigger a seizure in a controlled environment, such as through sleep deprivation, flashing lights, or hyperventilation, in order to capture and evaluate the seizure activity.

PHARMACOLOGICAL MANAGEMENT:

- **Carbamazepine (Tegretol):** It is used to treat focal seizures, and may also be effective for some generalized seizures.
- **Valproic acid (Depakene, Depakote):** It is used to treat focal seizures, generalized seizures, and absence seizures.
- **Lamotrigine (Lamictal):** It is used to treat focal seizures, generalized seizures, and absence seizures.
- **Levetiracetam (Keppra):** It is used to treat focal seizures and generalized seizures.
- **Topiramate (Topamax):** It is used to treat focal seizures and generalized seizures.
- **Oxcarbazepine (Trileptal):** It is used to treat focal seizures.
- **Phenytoin (Dilantin):** It is used to treat focal seizures and generalized seizures.
- **Phenobarbital (Luminal):** It is used to treat focal seizures and generalized seizures, and may also be used in some cases for status epilepticus (a prolonged seizure or a series of seizures that do not stop).
- **Ethosuximide (Zarontin):** It is used to treat absence seizures.
- **Gabapentin (Neurontin):** It is used to treat focal seizures.
- **Pregabalin (Lyrica):** It is used to treat focal seizures.

NON-PHARMACOLOGICAL MANAGEMENT/PREVENTION:

- **Medication adherence:** If you have been diagnosed with epilepsy and prescribed anti-epileptic medications (AEDs), it is crucial to take them as prescribed by your healthcare professional. Skipping doses or stopping medication abruptly can increase the risk of seizures.
- **Avoiding triggers:** Identifying and avoiding triggers that may provoke seizures in individuals with known epilepsy can be helpful. Common triggers may include sleep deprivation, stress, alcohol or drug use, flashing lights, or specific foods. Keeping a seizure diary and working with a healthcare professional can help identify and manage triggers.

- **Getting enough sleep:** Adequate sleep is important for overall brain health and can help reduce the risk of seizures in individuals with epilepsy. Establishing a regular sleep routine and aiming for 7-9 hours of sleep per night can be beneficial.
- **Managing stress:** Stress can be a trigger for seizures in some individuals with epilepsy. Finding effective stress management techniques, such as exercise, relaxation techniques, and counseling, can help reduce stress and its potential impact on seizure frequency.
- **Avoiding alcohol and recreational drugs:** Alcohol and certain recreational drugs can lower the seizure threshold and increase the risk of seizures in individuals with epilepsy. Avoiding or minimizing alcohol and drug use is recommended.
- **Safety precautions:** Taking appropriate safety precautions can help reduce the risk of injury during a seizure. This may include avoiding activities such as swimming, bathing, or cooking alone, using caution when engaging in physical activities or operating heavy machinery, and using protective equipment such as helmets or padding when necessary.
- **Regular medical follow-up:** Regular follow-up appointments with a healthcare professional, such as a neurologist or epileptologist, are important to monitor seizure control, adjust medications as needed, and address any concerns or questions.
- **Genetic counseling:** If there is a family history of epilepsy or other genetic factors that may increase the risk of epilepsy, genetic counseling and testing may be recommended to assess the risk and provide appropriate guidance.