Epilepsy ⇒

- A Seizure can be defined as the occurrence of signs/and or symptoms due to abnormal, excessive, synchronous neuronal activity in the Brain.

Classification

Historically the names like
Grandmal seizures - (Tonic-clonic seizures)
Petit mal seizures - absence seizures
or other than grandmal.
other like 'Simple partial' or Complex partial were also used.

New 1) Generalized Seizures:-

1) Tonic-clonic
2) Absence.
3) Tonic
4) Clonic.
5) Atonic.
6) Myoclonic
   → Myoclonic.
   - Myoclonic atonic
   - Myoclonic tonic
7) Myoclonic absence.
8) Eyelid myoclonia.

2) Focal seizures

1) With Consciousness (Simple Partial)
   - Focal motor
   - Focal Sensory.
2) Without consciousness (Complex partial)
3) Evolving into Generalized bilateral seizure. (Secondary Generalized seizure)
   - Tonic
   - clonic
   - Tonic-clonic
3) Epileptic Spasms

V
I
T

A → Autoimm
M → Metaboli
→ Vitamin B₁₂, Na, K
I → Idiopath
N → Neoplasm
Syncope

Causes

1) Focal Seizures
   +) Genetic - Neurofibromatosis, Tuberous Sclerosis.
   2) Infective - Cerebral abscess, Toxoplasmosis, Cysticercosis. HIV, Encephalitis, TB,
   3) Inflammatory - Sarcoidosis, Vasculitive - Autoimmune diseases. SLE
   4) Tumors - Primary - Benign & Malignant -
      ↳ Secondary (Glioma, Oligodendroglioma, Meningioma, Neurofibroma).
   5) Trauma. including neurosurgery.
   6) Vascular - Intracerebral hemorrhage, Cerebral infarction, Arteriovenous malformation.
   7) Infarcts. Hemiplegia.
   8) Dysembryonic.
   9) Eclampsia.

2) Generalized tonic-clonic seizures
   1) Causes of Focal.
   2) Cerebral Birth Injury
   3) Hydrocephalus.
   4) Drugs.
   5) Alcohol - Cerebellar withdrawal.
   6) Toxins - Organophosphates, Heavy metals.
   7) Metabolic - Hypocalcemia, Hyponatremia. ↓ mg, Renal Failure, Liver failure.
   7) Degenerative → Alzeimers diseases.

Pathophysiology

Excitatory
Neurotransmitters
(Aspartate & Glutamate).
↓
Receptors
↓
Opening of the Na^+ & Ca^+ channels.
↓
Cells Depolarize and develop of action potential
↓
Excitary.

Inhibitory
Neurotransmitters
(GABA = Gamma-aminobutyric acid).
↓
Receptors
↓
Opening of the Cl^- channels
↓
Cells Repolarize
↓
Inhibition

- In Epilepsy, Too much Excitation / Too little inhibition
→ Sudden Excitary signals
"Paroxysmal" depolarization

Triggering factors of seizures
1) Sleep deprivation
2) Alcohol (particularly withdrawal)
3) Drug misuse
4) Physical and mental exhaustion
5) Flickering lights including Tv and computer screen (Generalized ones).
6) Uncommon ⇒ loud noise, music, reading
7) Missed dose of antiepileptic in treated patients

Clinical Features

- Triggers and patterns of appearance should always should be asked in order to clarify the seizures.

Outward signs
↓
Jerking, moving
Losing consciousness

only By Patient
- Fear, strange smell.

- Usually depends upon the area of attack.
- Patients with age above mid-thirty always has focal cerebral event.

Focal Seizures

- May be with awareness or unconscious
- Patient may stop and stare blankly; with frequent blinking, smackings of lips and other automatism, after few minutes regains consciousness but drowsy for an hour. It may mimic childhood absence seizure.

Frontal → Bizarre behaviour pattern, limb posturing, sleep walking, Incoherent screaming,

Temporal → Facial recognition, sensation alteration.

Occipital → Visual C changes and blobs of colour.

- Focal seizure of simple partial variety may start from lower limb and spread to the ipsilateral side of the face called as Jacksonian march.

Generalized seizures

1) Tonic clonic seizure

- An initial aura may be felt. depending upon the area affected - (Cortex).
- Patient becomes rigid (tonic) and unconscious falling heavily if standing (like a log) and facial injury.
- During this phase breathing is arrested and central cyanosis appear.
- An cortical discharge reduces, jerking (clonic) movements appear after 2 minutes.
- After that the placid state of deep coma for minutes and regaining consciousness and confused, amnesic.
- Tongue, Urinary incontinence are very common, Bitten, Bleeding tongue after the loss of consciousness is the pathognomonic feature of Generalized seizure.
- Witness are usually frightened by the event and think he might die so doesn't give a clear account of episode.

2) Absence seizures (Petit mal).

- Always in childhood.
- They are born and regain consciousness (Spaced out)
- Occurs 20-30 times a day; and mistaken for daydreaming or poor concentration. Or ADHD

Tonic → ↑ Muscle tone, Stiff & flexed - falling backwards.

Clonic → Similiare to tonic & clonic seizure but no tonic phase.

Atonic → There are seizure involving brief loss of muscle tone, heavy falls on the front

Myoclonic → Brief, jerky, movements predominatly in the arms. Usually after akeel, fatigue, sleep deprivation, 0-18seconds.

(Clonic - 1-2 seconds)

3) Epileptic Spasms

- They are Uncertain whether generalized or focal nature.

Investigation

To locate the seizure → Standard EEG
Sleep EEG.

To Find Cause →

Structural → CT / MRI.

Metobalic → Urea and Electrolytes, Liver Function Test, Blood glucose.

Inflammatory → EBC, ESR, CRP.
Study for HIV, Syphilis.
CSF Examination.
Chest xRay.

Attacks are truely epileptic → Ambulatory EEG.

Status Epilepticus

- Seizural activity not resolving spontaneous or recurrent seizure with no recovery of consciousness in between.
- Usually Tonic, clonic.
- Cyanosis, Pyrexia, sweating occurs
- Complication → Hypotension, Cardiac arrythmia, Renal and Hepatic Failure.
- It is a medical emergency which may lead to mortality.

Complication after Seizure

① Post Ictal Confusion

② Todd's paralysis (Paresis)

↳ An override occurs on legs, Lasts for 15hrs, Subsides completely after 2days.

- Due to temporary and reverse Suppression of seizure affected area.

Management:

- Avoiding the Triggers.
- Only shallow Bathing.
- Quitting Occupations like airline pilot, Fire fighter, Height, Diet
- Ketogenic Diet