EPILEPSY
ANTIEPILEPTICS

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Introduction

- Terms Seizure and Epilepsy are not synonymous

Seizure

- A seizure is a paroxysmal event due to abnormal, excessive, hypersynchronous discharges from an aggregate of central nervous system (CNS) neurons (cortical neurons).

Epilepsy

- Epilepsy describes a condition in which a person has recurrent seizures due to a chronic, underlying process.

- Single seizure, or recurrent seizures due to correctable or avoidable circumstances, does not necessarily have epilepsy

Epilepsy - dfn

These are group of disorders of CNS, characterised by paroxysmal cerebral dysrhythmia, manifesting as brief episodes (seizures) of loss or disturbance of consiousness, with or without characteristic body movements (convulsions)

CONVULSION :

Motor manifestation of seizure

- Clinically, epilepsy is defined as a condition characterised by recurrent (two or more) unprovoked seizures

CAUSES

- Seizures are a result of a shift in the normal balance of excitation and inhibition within the CNS.

..... i.e. Abnormal discharges of neurons

- That may be caused by any pathological process affecting brain>>>>

Aetiology

• Epilepsy is due to a population of abnormal hyperexcitable neurons. Excitatory transmitters depolarise and inhibitory transmitters hyperpolarise the neuronal membrane. The discharge is governed by the balance between these two opposing factors.

• Acetylcholine is the excitatory transmitter.
• GABA is the inhibitory transmitter.

• Epilepsies maybe primary or secondary

- *Primary*
  • In majority of cases, epilepsy is idiopathic and the cause is not known. There maybe a positive family history, onset is in childhood and has a genetic background.

- *Secondary*
  - Any intracranial disease like cerebral tumours, head injury, cerebrovascular accidents and CNS infections.
  - Hypoglycaemia and hyperglycaemia.
  - Uraemia,
  - Ingestion or withdrawal of alcohol or drugs.

ETIOLOGY

PERINATAL :

- Cerebral malformation.
- I.U. TORCH Infection
- HIE
- Trauma
- Intra ventricular Hemorrhage

INFECTIONS :

- ✓ Encephalitis
- ✓ Meningitis
- ✓ Brain Abscess

METABOLIC CAUSES :

- ❖ Hypocalcemia
- ❖ Hypoglycemia
- ❖ hypomagnesemia
- ❖ Hypo / Hypernatremia

SYSTEMIC DISORDER

1. Vasculitis
2. SLE
3. Hypertensive Encephalopathy.
4. Renal failure
5. Hepatic Encephalopathy

OTHERS

1. Trauma
2. Febrile convulsion.*
3. Idiopathic.*
4. Tumor.
5. Familial.
6. Drug withdrawl—AED.
7. Alcohol withdrawl.

Classifications

- **According to etiology:**
  - ✓ Primary/ Idiopathic (etiology not identified)- 85%.
  - ✓ Secondary (with identified etiology) –15%.

- **According to type:**
  - ✓ Generalized.
  - ✓ Focal/ partial.

Types of Epilepsy

Generalised seizures

- Tonic-clonic (Grand mal)
- Tonic
- Absence (Petit mal)
- Atypical absence
- Myoclonic
- Atonic
- Clonic

Focal (Partial) seizures

- **Simple partial seizures**

  Simple partial motor

  Simple partial sensory

  Others

- **Complex partial seizures**

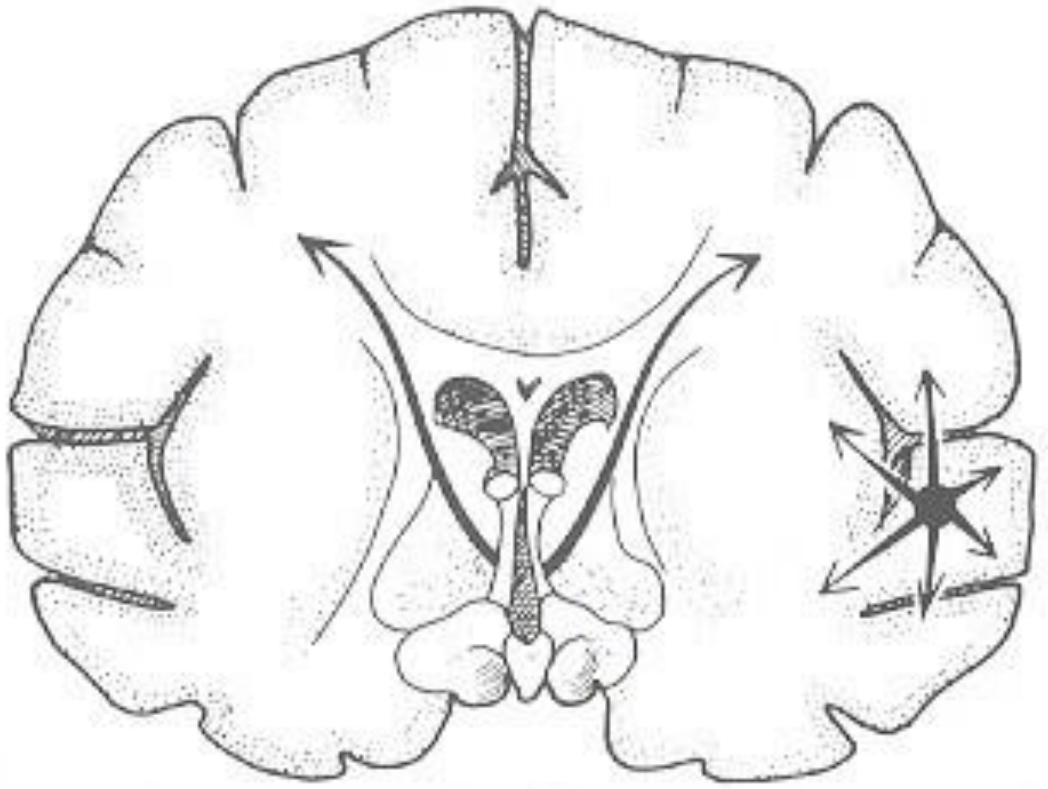
- **Secondary generalized partial seizures**

UNCLASSIFIED SEIZURES

i. Unclassified seizures
ii. Neonatal seizures
iii. Infantile spasms

PARTIAL SEIZURES

- Synonymous with focal
- Activity is restricted to discrete areas of cerebral cortex.
- Typically associated with structural abnormalities of the brain.



Generalized

- Involve diffuse regions of the brain simultaneously in a bilaterally symmetric fashion
- May result from cellular, biochemical, or structural abnormalities that have a more widespread distribution.

Partial Seizures

Partial Seizures

- Discrete regions of the brain.
- Consciousness is fully preserved during the seizure (Simple-partial seizure)
- Consciousness is impaired (Complex partial seizure)
- Partial seizure and then spread diffusely throughout the cortex (partial seizure with secondary generalization)

Partial Motor Seizures.

- Due to seizure activity in the precentral gyrus.
- Motor seizures affect the contralateral face, arm, trunk or leg.
- Movements typically clonic
- Pure tonic posturing may also be seen.

- Additional features of partial motor seizures.

JACKSONIAN SEIZURE

  - Motor seizure begins in a restricted region such as the fingers and gradually progresses over seconds to minutes to include a larger portion of the extremity.

TODDS PARALYSIS.

- Patients may experience paresis of the involved limb for minutes to many hours following the seizure.

EPILEPSIA PARTIALIS CONTINUA

- Rarely the seizure may continue for hours to days when it is called epilepsia partialis continua.
- Often refractory to treatment.
- Seen in HONK

VERSIVE SEIZURES

- A frontal epileptic focus may involve the frontal eye field causing forced deviation of the eyes and sometimes turning of the head to the opposite side.

PARTIAL SENSORY SEIZURES

- Somatosensory seizures.
- Special sensory seizures.

Somatosensory seizures

- Focus in the contralateral post rolandic convolution.
- Sensory seizures described as
  - Numbness
  - Tingling
  - Pins and needles feeling
  - Sensation of crawling (formication)
  - Electric sensation,
  - Sensation of movement of the part.
  - Pain and thermal sensations occur occasionally.

Special sensory seizures

- Visual seizures.
  - Rare.
  - Occur as sensation of darkness or flashes of light which may be stationary or moving.
  - May appear colourless or coloured.
  - There may be twinkling or pulsating lights.
  - Visual hallucinations may occur with involvement of occipito-temporal or antero-medial temporal areas.

- Auditory hallucinations.
  - Rare.
  - There may be sensation of buzzing or roaring in the ears or sensation of human voice repeating unrecognisable words.

- Olfactory hallucinations.
  - assoc with lesions of inferior and medial parts of temporal lobe usually in the region of parahippocampal convolution or uncus and hence the term uncinate seizures.
  - patient perceives a foul smell

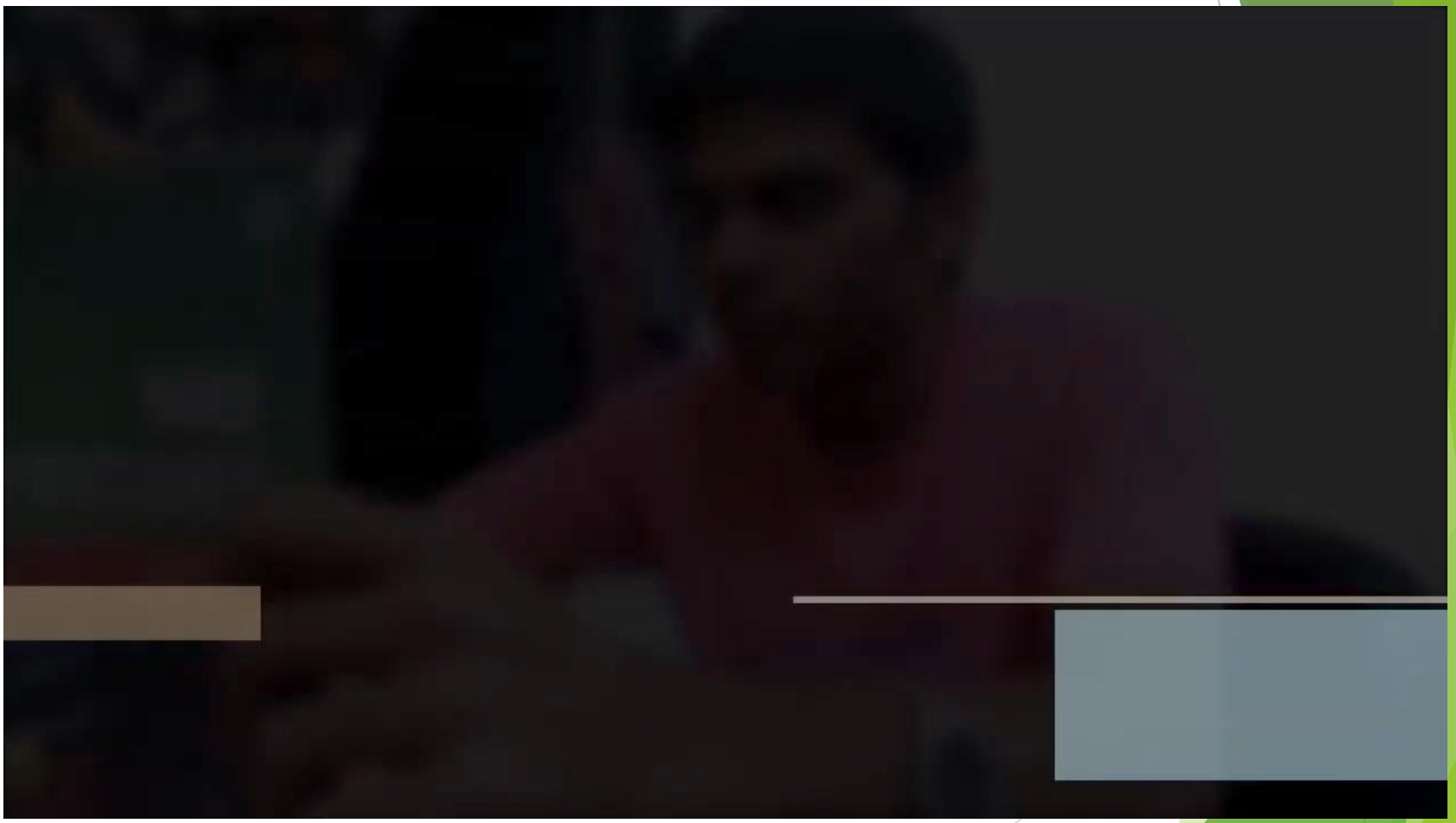
- Gustatory hallucinations.
  - in temporal lobe disease.
  - salivation and sensation of thirst is present.
  - Vague and often indefinable visceral sensations arising in the thorax, epigastrium and abdomen may occur with temporal lobe focus.

SIMPLE PARTIAL SEIZURE (SPS) :

- Begin in a small group of dysfunctional neuron.
- Conciousness remains intact, may talk during seizure.
- Patient experience ‘Aura’ which reflects site of origin.

  Eg- abdominal pain, thoracic pain.

- Last for 10—20 seconds.
- No post ictal Phenomenon.
- When SPS spread from one part of the body to another according to the representation in Precentral gyrus is Called ***JACKSONIAN MARCH***.



COMPLEX PARTIAL SEIZURES OR PSYCHOMOTOR SEIZURES TEMPORAL LOBE SEIZURES.

These patients have

- Aura- in the form of a simple focal seizure or a hallucination or illusion suggestive of a temporal lobe origin.
- have a period of altered behavior, altered consciousness and amnesia to the event.

- Psychic experiences which occur in complex partial seizures.

Sensory illusions and distortions

- Micropsia and macropsia- objects and persons in the environment appear to shrink or recede into distance or may enlarge

Hallucinations.

- Visual and Auditory common.
- Olfactory and gustatory rare.

Dyscognitive states.

- De javu- feelings of increased familiarity.
- Jamais vu- feelings of strangeness or unfamiliarity.
- Feeling of depersonalisation.
- Sudden interruption in memory.
- Fragments of old memories and scenes appear in patients mind and recur with striking clarity.

- Each of these psychic experiences may constitute the entire seizure or some combination may occur and proceed to a period of unresponsiveness.
- Immediately after the psychic experience there follows a sudden behavioural arrest or motionless stare which is accompanied by automatisms.

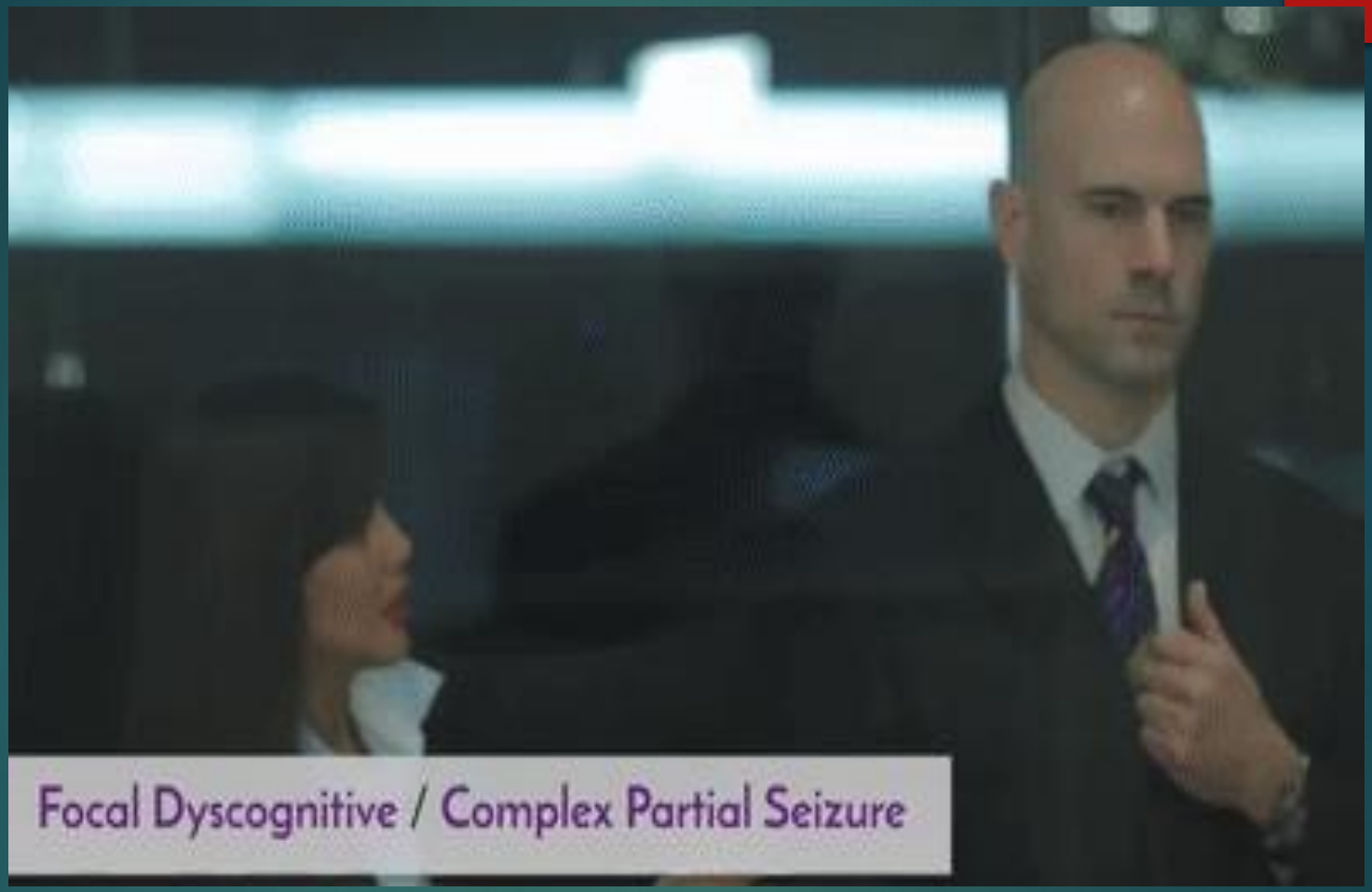
- AUTOMATISMS - occur in the form of
  - Lipsmacking
  - Chewing
  - Swallowing
  - Fumbling of hands
  - Shuffling of feet
  - Inappropriate acts.

- OTHER AUTOMATISMS.
  - Gelastic epilepsy — laughter may be the most striking feature of an automatism.
  - Volvular epilepsy—patient may walk repititively in small circles.
  - Epilepsia procursiva—runs repititively.

- During the episode, patient is not in contact with his surroundings.
- Patient is typically confused following the seizure.
- May take seconds to an hour for full recovery of consciousness.
- Postictally patient may show anterograde amnesia or aphasia (if dominant hemisphere)

- Cp seizure pts may show - features of
  - Depressive illness
  - Psychotic symptoms
  - Paranoid delusional state and
  - Abnormalities of behaviour and
  - Personality during interictal period.

- CP seizures can occur at any age.
- Usually seen in adolescence and adults.
- H/o febrile seizures in childhood is often present.
- 2/3rds of CP seizure pts have GTC seizures.


Focal Dyscognitive / Complex Partial Seizure

PARTIAL SEIZURES WITH SECONDARY GENERALISATION.

- Partial seizures can spread to both hemispheres and produce GTC seizures.
- Is often difficult to distinguish from primary GTC seizure.

Generalized Seizures

Generalized Seizure.

- Arise from both cerebral hemispheres
- Practically defined as bilateral clinical and electrographic events without any detectable focal onset.

Generalized Seizures

- Absence Seizure (Petit Mal)
- Atypical Absence Seizures
- Generalized, Tonic – Clonic Seizure (Grand Mal)
- Atonic Seizure
- Myoclonic Seizure

ABSENCE SEIZURES (PETIT MAL).

- characterised by sudden LOC without loss of postural control.
- seizure typically lasts for only seconds.
- consciousness returns as suddenly as it was lost.
- no postictal confusion.

ABSENCE SEIZURES

- Absence seizures may be accompanied by rapid blinking movements, chewing, or clonic movements of the hands.
- Begin in childhood (4-8 yrs age) or early adolescence.
- in 15-20% of children with epilepsy.
- May occur 100 times a day (pykno epilepsy)

- May manifest as unexplained day dreaming or poor performance.
- EEG-typically reveals characteristic generalised 3 -Hz/sec spike and wave discharges.
- Respond well to treatment.
- About 60—70% usually have a spontaneous remission during adolesence.
- May be associated with GTC seizures.

ABSENCE SEIZURE TYPES

- Age: 4—10 years. Sex- Female (common)
- No Aura, no post ictal phase.
- Transient loss of Conciousness (2—10 sec).
- With abrupt onset and Termination.

- Sudden cessation of motor activity or Speech.
- Blank facial expression / starring look.
- Eye blinking , lip smacking .
- Rare before 4 years.
- Hyperventillation for 3—4 min. induce Absence seizure due to alkalosis.

GTCS

Generalized Tonic Clonic Seizures

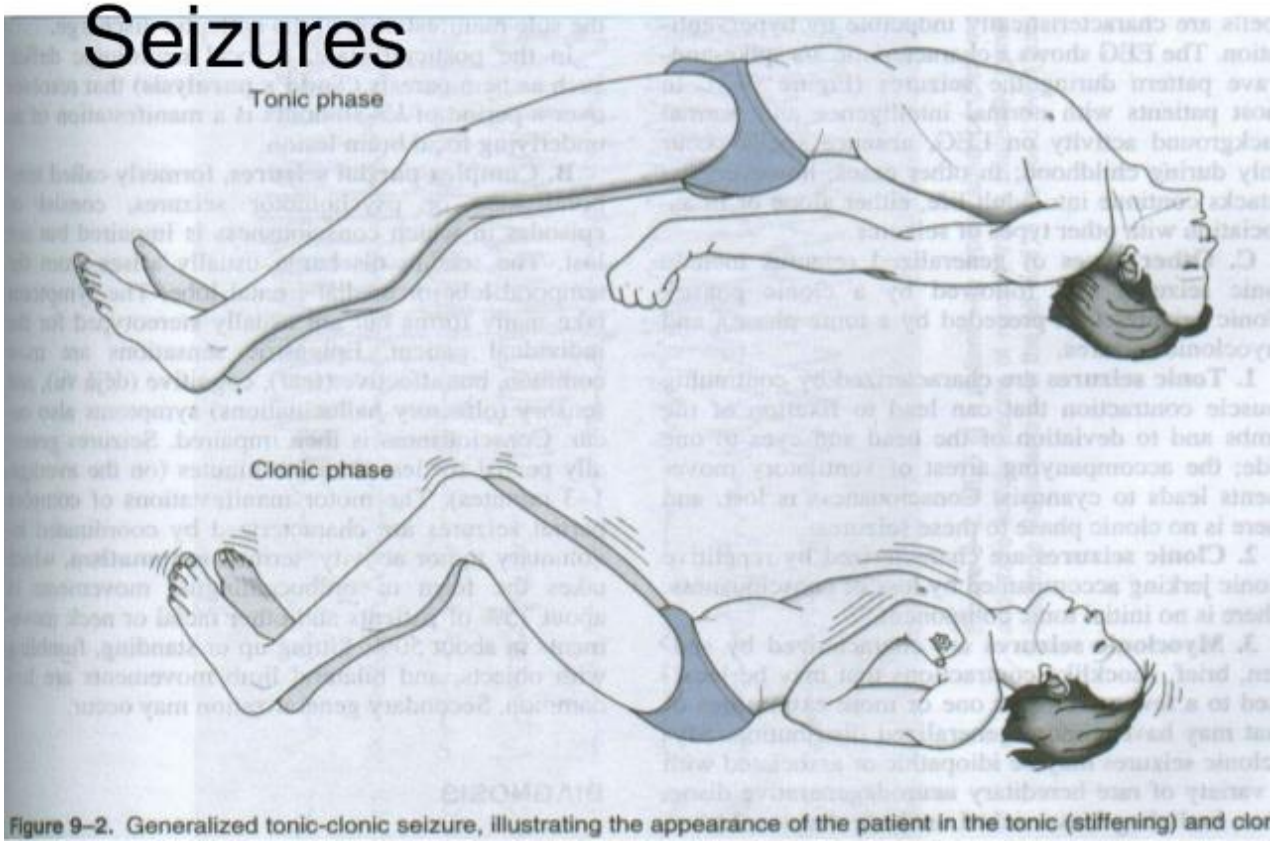


Figure 9–2. Generalized tonic-clonic seizure, illustrating the appearance of the patient in the tonic (stiffening) and clo

GENERALISED TONIC AND CLONIC SEIZURES (GRAND MAL SEIZURES).

- Most common seizure type due to metabolic derangements.
- 10% of all patients with epilepsy have GTC seizures.

- GTC seizures are characterised by
  - premonitory phase.
  - Ictal phase.
  - post –ictal phase.

PREMONITORY PHASE

vague premonitory symptoms may be present and patients feel that the seizure is imminent.

- ICTAL PHASE
  - May begin abruptly without warning.
- ***Tonic phase***
  - characterised by tonic contraction of muscles throughout the body .There is extension of the back and neck,foll by arms and legs. This is accompanied by LOC, upward eye deviation and pupillary dilatation.

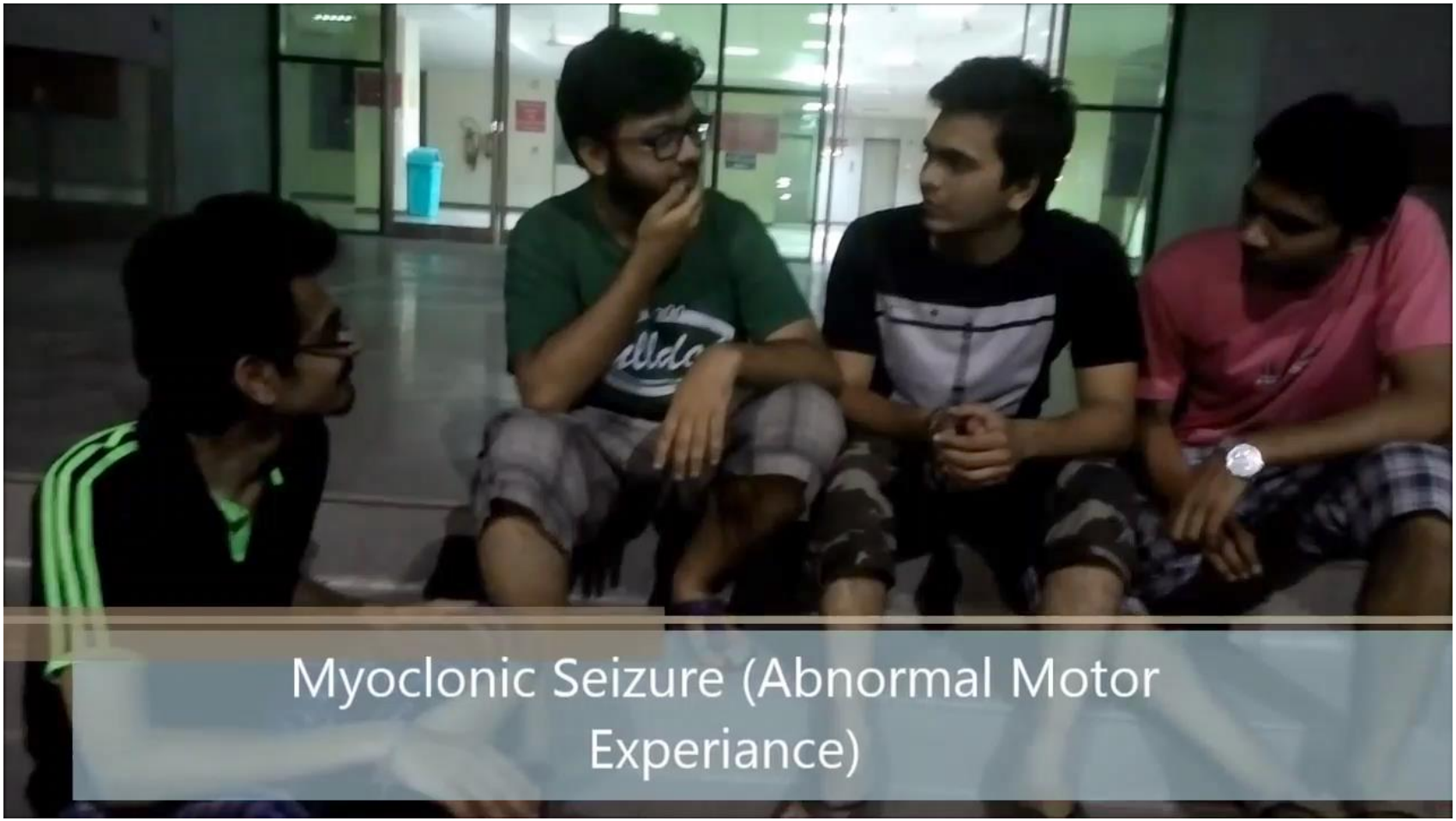
- Ictal cry
  - tonic contraction of muscles of expiration and of larynx at the onset will produce a loud moan called ictal cry as air is forcibly emitted through closed vocal cords. Respirations are impaired, secretions pool in the oropharynx and cyanosis develops.
- Tongue bite
  - contraction of the jaw muscles causes biting of the tongue.

- Increased sympathetic tone leads to increase in heart rate, BP and pupil size.
- Tonic phase lasts upto 10—30 secs and is followed by clonic phase.
- ***Clonic phase***
  - during this phase, there are convulsive movements of all the 4 limbs. jaw and facial muscles. Breathing may be stertorous and saliva may froth from the mouth.
  - The ictal phase usually lasts no more than 1 min.

- **POST ICTAL PHASE**
  - Characterised by unresponsiveness, flaccidity, hypersalivation.
  - Bladder or bowel incontinence may occur.
  - Consciousness is gradually regained over minutes to hours followed by post ictal confusion.
  - Subsequently patients complain of headache, fatigue or muscle ache.

- **ATONIC SEIZURES**
  - Sudden loss of muscle tone lasting 1—2 secs
  - Brief impairment of consciousness.
  - No post ictal confusion.
  - EEG reveals brief generalised spike and wave discharges followed immediately by diffuse slow waves that correlate with loss of muscle tone.
  - Usually seen in association with known epileptic syndromes.

- MYOCLONIC SEIZURES
  - Sudden and brief muscle contraction involving one part of the body or the entire body.
  - Seen physiologically while asleep.
  - Pathologic myoclonus seen in association with metabolic disorders, degenerative CNS diseases, or anoxic brain injury.


Myoclonic Seizure (Abnormal Motor
Experiance)

Unclassified Seizures

Neonatal Seizure

- Less than 1 month of age.
- Brief episodes of apnea, eye deviation, eye blinking, or repetitive movements of the arms and legs.

Infantile Spasms/ Salam attacks

- Infants under 12 months.
- Abrupt movements of the head, trunk, or limbs.
- The classic spasm is a sudden flexion of the neck and abdomenwith extension of the limbs.

EPILEPSY SYNDROMES

Syndrome types in different age groups

Infancy;

-West Syndrome

-Ohtahara Synd.

-Dravet Syndrome

Early Childhood (1-5y)

-LGS

-Febrile Seizures

Late Childhood (5-10y)

-Absence Epilepsy

-Landau-K syndrome

-Benign Rolandic E.

Adolescence

-JME

-Juvenile Absence epi

STATUS EPILEPTICUS

Status epilepticus

- Status epilepticus denotes sustained epileptic activity, and is clinically diagnosed with one of the following two:

• Two seizures occur without recovery of consciousness in between.

• A single seizure lasts longer than 30 minutes with or without loss of consciousness.

• However, most physicians define status epilepticus as either convulsion lasting for more than 5 minutes (as patients with seizures that last more than 5 minutes are not likely to improve spontaneously) or when two seizures occur between which there is incomplete recovery of consciousness.

• Condition is fatal or results in severe morbidity if not treated rapidly.

- **Classification**
  • Status epilepticus can be classifed into: partial and generalised.

- • Generalised status epilepticus is further divided into: convulsive status epilepticus (tonic-clonic being the commonest)
  and non-convulsive status epilepticus (characterised by slowness in behaviour and mentation, confusion and sometimes stupor, and accompanied by generalised epileptic discharges). The latter includes absence or petit mal status.

- • Partial status epilepticus includes partial motor status (associated with characteristic march of motor symptoms), partial sensory status, complex partial status and epilepsia partialis continua (focal motor seizures without a march).

- *Step A (First 20 Minutes)*
  - Maintain airway.
  - Secure a proper IV line, and draw blood for metabolic parameters. Check fr blood sugar on bedside.
  - Elicit a brief history from the relatives about any previous seizures, diabetes, hypertension, drug exposure or withdrawal, and head injury.
  - Conduct a rapid examination to determine presence of focal signs, obvious medical illness, increased intracranial tension
    and associated injuries.
  - Simultaneously, administer diazepam (10-20 mg IV over 1-2 minutes, maybe repeated every 10 minutes) or lorazepam (2-4 mg IV over 2 minutes) followed by loading dose of phenytoin (18-20 mg/kg) at a rate of not more than 50 mg/minute in adults and 25 mg/minute in children. Otherwise, hypotension or bradyarrhythmia may occur.

- *Step B (20-60 Minutes)*
  - Phenobarbital (20 mg/kg IV at a rate of 50 mg/minute) or diazepam infusion (2- mg/hour in adults). Both may require assisted ventilation.
  - Valproic acid is given in a dose of 30 mg/kg over 2-5 minutes, followed by infusion at 1-5 mg/kg/hour. Another 10 mg/kg maybe given 10 minutes after initial dose

- *Step C*
  • General anaesthesia or thiopental infusion is tried. Other drugs include midazolam and propofl.
  • Midazolam-0.1-0.2 mg/kg loading followed by 0.1-2.0 mg/kg/hour.
  • Propofol-1-2 mg/kg loading followed by 1-10 mg/kg/hour.
  • Thiopental-5-7 mg/kg IV followed by 50 mg boluses every 2-3 minutes till seizure control and then
  3-5 mg/kg/hour.
  • Simultaneously, BP, acidosis, ventilation and electrolyte balance are taken care of. Underlying cause should be rectifed appropriately.
  • Aim should be to control seizures within 1 hour afer admission. Otherwise, chances of residual morbidity or mortality rise steeply as duration of status gets prolonged.

Evaluation of the patient

- **Diagnosis of Epilepsy**
  - Attempt should be made to fnd out:
  - Whether an attack is really an epileptic ft or some other brief disorder of consciousness or disorder of CNS, e.g. syncope, migraine, transient ischaemic attack, psychogenic non-epileptic seizures, etc.

- *Role of EEG*
  • Helps in differentiating primary generalised attacks from focal epilepsies.
  • Confirms the clinical diagnosis (by showing *spikes and sharp waves), but normal record may occur in about 60% cases*
  with one seizure and 40% cases with established epilepsy.
- If first EEG is normal, it should be repeated with the patient sleep deprived, although the test may still be normal.
- • Video EEG: Prolonged EEG-video monitoring provides information about electrographic seizures and seizure activity
  (actual events recorded on video). It helps in making a defnitive diagnosis of Epilepsy.
- • Ambulatory EEG is analogous to Holter monitor for cardiac arrhythmias. However, unlike video EEG, it does not permit correlation between electrographic seizures with actual events.

Laboratory studies

- Electrolytes
- Glucose
- Ca
- Mg
- Liver and renal function test
- Urianalysis
- Toxicology screen
- Lumbar puncture- CSF ANALYSIS

- EEG
- CT
- MRI
- SPECT

Diferential Diagnosis

- Syncope
- Psychological disorders
- Metabolic disturbances
- Migraine
- TIA
- Sleep disorders
- Movement disorders

TREATMENT

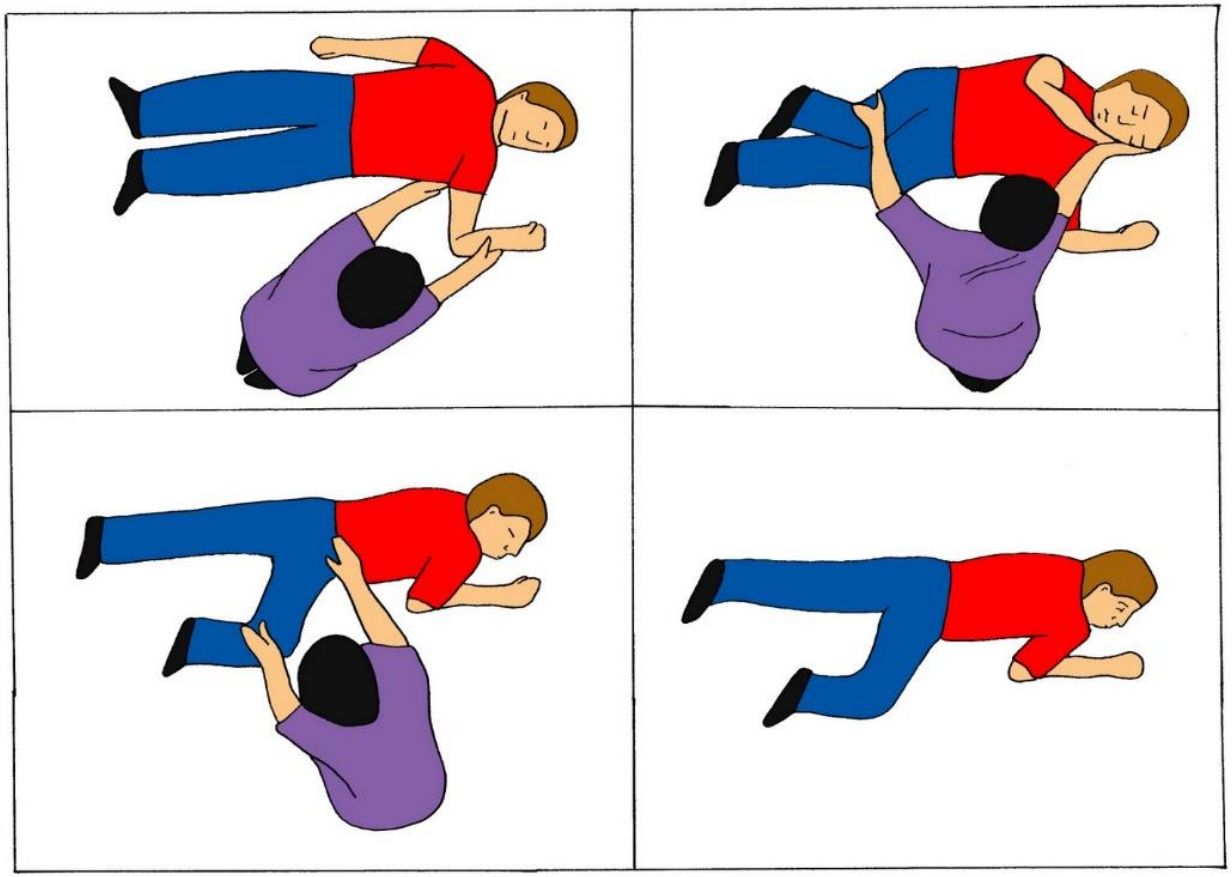
- **Treatment**

  • A fIrst seizure provoked by an acute brain disturbance is unlikely to recur (3-10%), whereas a first unprovoked seizure has a recurrence risk of 30-50% over the next 2 years.

  General

  • Tide over the stigma by proper explanation.
  • Children not to cycle on public roads.
  • No swimming.
  • Adopt an occupation at which neither the patient nor society is put to risk.
  • Avoid exposure to moving machinery and working at heights.
  • Driving only as per regulations (fee of attacks fr 2 years). '
  • Adequate sleep.
  • Avoid hyperpyrexia, flickering lights and emotional disturbances.

- *During a Fit*
  - Protect fom injury by moving the patient away fom fire, sharp and hard objects.
  - Padded gag inserted within teeth.



First aid for seizures

Do

- Remove harmful objects nearby
- Cushion their head
- aid breathing by gently placing in recovery position

Don't

- Restrain the person movement
- Put anything in the person's mouth
- Give them anything to eat and drink

until they are fully recovered

ANTIEPILEPTIC DRUGS

PRINCIPLES OF TREATMENT

- **Monotherapy** is the mainstay
- Started with **Low dose**
  - then gradually inc. till full control of seizure
  - if still not controlled, substitute drug
- Withdrawals should be **gradual**/not abrupt
- **Prolonged** therapy for atleast 2-3 yrs
- Determinant of dosage – Clinical occurrence of seizure & Adverse effects rather than serum conc of drug

CLASSIFICATION OF ANTIEPILEPTIC DRUGS

- Hydantoins: phenytoin, phosphenytoin
- Barbiturates: phenobarbitone
- Iminostilbenes: carbamazepine, oxcarbazepine
- Succinimides: ethosuximide
- Aliphatic carboxylic acid: Valproic acid, divalproex
- Benzodiazepines: clonazepam, diazepam, lorazepam
- New compounds: gabapentin, lamotrigine, tiagabine, topiramate, vigabatrin, zonisamide, felbamate, Levetiracetam

MECHANISMS OF SEIZURE & ANTISEIZURE DRUGS:

Most common ones:

- Modification of ion conductance
  - Prolongation of Na+ channel inactivation
  - Inhibition of `T` type Ca++ current
- Increase inhibitory (GABAergic) transmission – Cl- Channel.
- Glutamate receptor antagonism (NMDA, AMPA, or kainic acid)

THE SODIUM CHANNEL – CONTD.

Drugs acting via this channel:

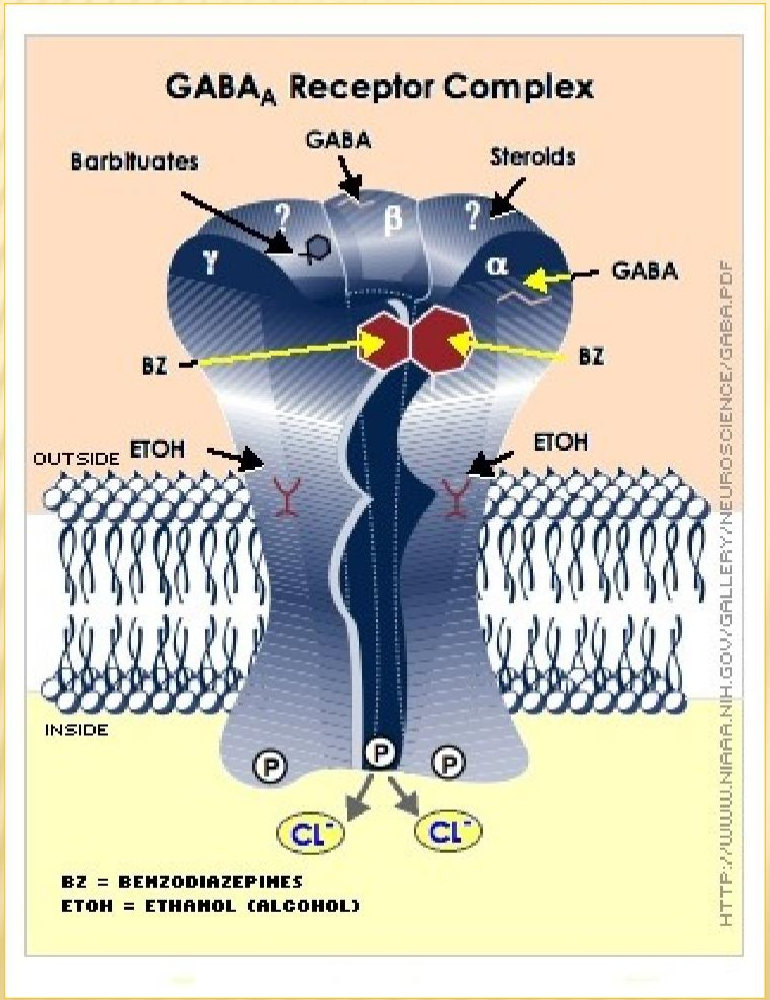
Phenytoin, Sodium Valproate, Carbamezepine, Lamotrigine, Topiramide and Zonisamide

ANTICONVULSANT MECHANISM – CONTD.

T type Ca++ current inhibition:

- Thalamic neurons exhibit prominent T current which is a low threshold Ca++ current
- T type current is responsible for 3 Hz spike-and-wave
- Throughout the thalamus `T` current has large amplitudes – thalamocortical oscillations
- Bursts of action potential is by action of T current
- In absence seizure
- Drugs – ethosuximide, valproate and trimethadione

ANTICONVULSANT MECHANISM – CONTD.



- The GABA mediated CL-channel opening
- Drugs: barbiturates, benzodiazepines, vigabatrin, gabapentin and valproate

CLASSIFICATION OF SEIZURES:

I) PARTIAL SEIZURES(Focal) (Carbamazepine)

- Simple partial
- Complex partial
- Partial with sec. generalisation

II) GENERALIZED SEIZURES

1. GTCS (Grandmal) (Valproate)
2. Absence (Petitmal) (Valproate/Ethosuximide)
3. Tonic
4. Atonic (Valproate)
5. Myoclonic (Valproate)

III) UNCLASSIFIED

- Neonatal seizures (Tt cause/Pb)
- Infantile spasm (Steroids/Valproate)
- Febrile fits (Rectal Diazepam)

IV) STATUS EPILEPTICUS (IV Lorazepam)

- Tonic clonic
- Absence
- Epilepsia partialis continua

EPILEPSY SYNDROMES

- Juvenile Myoclonic Epilepsy
- Lennox-Gestaut Syndrome
- Mesial Temporal lobe Epilepsy

ADVERSE REACTIONS

PHENYTOIN

- AT THERAPEUTIC LEVEL

  - Cosmetic effects - Gum hypertrophy, Hirsutism, Coarsening of face, acne,

  - Hypersensitivity reactions – Rashes, DLE Lymphadenopathy, neutropenia

  - Osteomalacia, Megaloblastic anemia, Hyperglycemia

- AT HIGH TOXIC LEVEL

  - CNS-Ataxia, vertigo, diplopia, drowsiness, confusion

  - GI- Epigastric pain, nausea, vomiting

  - IV inj – Fall in BP, Arrhythmia, local vascular injury

FOSPHENYTOIN - On IV inj.- less damaging to intima

- inj at faster rate

CARBAMAZEPINE

- Toxic metabolite (Epoxy cbz)
- CNS - Sedation, vertigo, diplopia, ataxia
- GI – Vomiting, diarrhoea,
- Hypersensitivity- Rashes, photosensitivity, lupus like syn, leucopenia,aplastic anemia
- Hepatotoxicity
- Water retention, hyponatremia

OXCARBAZEPINE

- No toxic metabolite / Few side effects, few drug interactions, less hepatotoxicity
- But hyponatremia is more

VALPROATE

- Toxicity is low/ Less sedation, cognitive & behavioural effects
- CNS – Dose related drowsiness,ataxia & tremor
- GI – Anorexia, vomiting
- Hypersens- Rash, trans alopecia, thrombocytopenia
- Asymptomatic rise in serum transaminase / Fatal hepatic failure in children
- Pancreatitis,PCOD & Menstrual irregularity

DIVALPROEX – GI tolerance better

BZD – DIAZEPAM,CLONAZEPAM,CLOBAZAM

- Sedation,Confusion, Fall in BP, Respiratory depression

EFFECT ON PREGNANCY

- PHENYTOIN (also Valproate & Cbz)

  Facial dysmorphism, microcephaly, cleft lip & palate, cardiac defects, digital hypoplasia, nail dysplasia

- VALPROATE & CBZ

  - Spina bifida & other neural tube defects

  - Prophylaxis – Folic Acid(1-4 mg/day)

- LAMOTRIGINE – Cleft lip

- PHENYTOIN,PHENOBARBITAL,PRIMIDONE

  - Bleeding tendency in fetus

  - Prophylaxis – Vit K

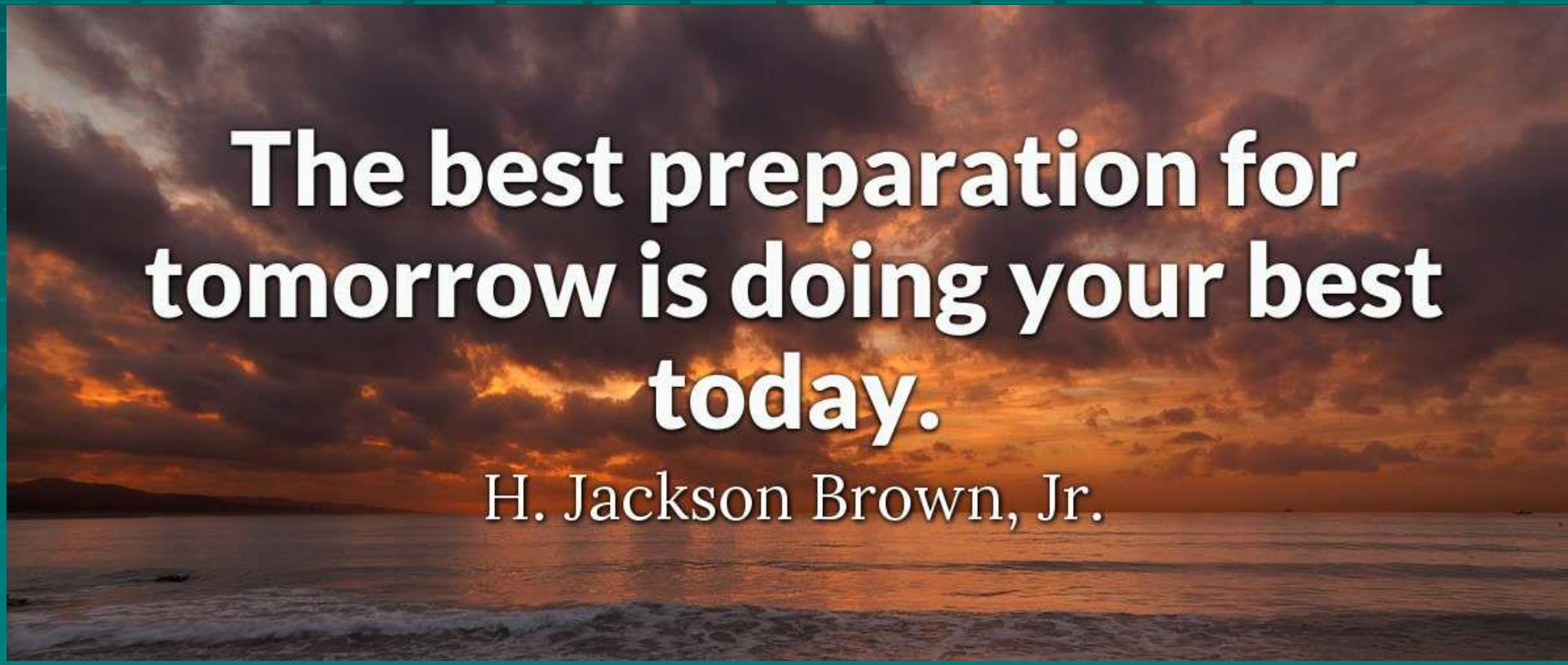
CONTRACEPTION

- Cbz, Phenytoin, Pb, Topiramate antagonise OCP

BREASTFEEDING

- Encouraged
- Max excre– Etho/Least excre- Valproate

THANK YOU


The best preparation for tomorrow is doing your best today.
H. Jackson Brown, Jr.