

Seizures in Childhood

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Definitions

- **Seizure**- Abnormal electrical discharges in brain that manifest as abnormal motor activity, impairment or loss of consciousness, sensory disturbances or autonomic dysfunction.
- **Convulsion**- Abnormal motor activity
- **Epilepsy**- Recurrent unprovoked seizures
- **Cataplexy**- Sudden loss of tone of muscles
- **Narcolepsy**- Sudden irresistible sleep

Seizure



Causes of Convulsion in Children

- Febrile Seizures
- Infections of CNS
 - Bacterial Meningitis
 - TB Meningitis
 - Encephalitis
 - Cerebral Malaria
 - Neurocysticercosis, Tuberculoma
 - Mumps/Measles Encephalopathy
 - Intrauterine Infections, Tetanus

Causes of Seizures

- Metabolic Causes

 - Hypoglycemia

 - Hypocalcemia

 - Hypomagnesemia

 - Dyselectrolytemia

 - Inborn errors of Metabolism

 - Acidosis

 - Alkalosis

Causes of Seizures

- ICSOL
- Vascular
 - A- V Malformation
 - Intra-cranial Thrombosis & Hemorrhage
- Miscellaneous Causes
 - Heat Stroke
 - Hypertensive Encephalopathy
 - Poisonings
 - Lead Encephalopathy

Classification of Epileptic Seizures

Generalized Seizures

1. Absences
Typical, Atypical
2. Generalized Tonic- Clonic
Tonic
Clonic
Myoclonic
Atonic
Infantile Spasms

Classification of Epileptic Seizures

Partial Seizures

1. Simple Partial (Consciousness Retained)
Motor, Sensory, Autonomic & Psychic
1. Complex Partial (Consciousness Impaired)
2. Secondarily Generalized Partial seizures

CLASSIFICATION (Contd)

UN-CLASSIFIED

Etiology

- Birth Injury
- Postnatal Trauma
- Tumor
- Infarction
- Abscess
- Vascular Malformations
- Structural Abnormalities

Partial Seizures

- Limited to a particular area of cortex
- The clinical patterns depends on the area of the cortex involved
- Consciousness
 - Retained- Simple
 - Impaired- Complex
- Jacksonian March

Partial Seizures

- In Lesions of Sensory Cortex
 - Sensory – Paresthesias, Auditory or Visual Hallucinations, Vertiginous feelings

- In Lesions of Temporal and Frontal lobes
 1. Autonomic-Excessive sweating or Salivation
 2. Psychic- *déjà vu*, Unwarranted fear or anger, Illusions or Complex Hallucinations

Generalized Seizures

- Tonic-Clonic (Grand mal)
Loss of consciousness— Tonic contraction—Clonic phase (Rhythmic contraction of all four limbs)
- Absence Seizures (Petit mal)- Sudden & brief cessation of ongoing conscious activity
No convulsive activity or no postural loss
- EEG pathognomonic 3 Hz spike and wave pattern

Grand mal Epilepsy



Generalized Seizures

- Atypical Absence- Absence with coexisting generalized seizures such as Tonic, Atonic or Myoclonic Seizures
- Tonic- Rigid posturing of limb or Torso often with deviation of head and eyes
- Atonic- Brief loss of consciousness and tone
- Myoclonic- Sudden brief contraction of a group of muscles, often symmetrical with loss of body tone and falling or slumping forward

Generalized Seizures

- Infantile Spasms (West Syndrome)
 - Starts at 4-8 months of age
 - Brief symmetric contraction of neck, trunk and extremities
 - . Appear just after awakening
 - . Three types- Flexor, Extensor, Mixed
 - . Characteristic EEG- Hypsyrhythmia
 - . Treated with ACTH

Approach to a Seizure Case

- 1 -2 % of Emergency Attendance

- 3% of Pediatric population

- Status Epilepticus

Single or Multiple Seizures for
>30 minutes WITHOUT REGAIN of
Consciousness

Treat if more than 5 minutes

Mortality 10% due to Disease or lack of
proper management

Principles of Management

1. Adequate Oxygenation
2. Terminate Seizure
3. Establish Diagnosis
4. Prevent Seizure

Management of Epilepsy

- History, Physical Examination and Biochemistry

DIFFERENTIAL DIAGNOSIS

Convulsive Syncope

Decerebrate Rigidity

Dystonia

Benign Paroxysmal Vertigo, Night Terrors,
Breath holding Spells

Pseudoseizures

Emergency Management

1. Adequate Oxygenation- A B C D

Position Airway Suction

Airway Application (Guedel)

Vitals BP, TPR, SpO₂

2. Terminate Seizure:- Rapid Acting AED

I.V. Access & Dextrose infusion

Collect Blood for Dextrose, Calcium

Phosphorus, Electrolyte,

Infection Study, Drugs/Poisons study

Emergency management (contd)

3. Establish Diagnosis

RBS, Sr. Cal/Phos, Magnesium Na.K.

ABG

Infection Study, Lumbar Puncture

EEG CT/ MRI

Video EEG, PECT scan

4. Prevent Seizure

Long term Drug Therapy

Emergency Management for Neonatal Seizure <2 Weeks

Manage Airway A B C D

Position the Child Secure IV Access

Check the Blood sugar <45mg%

Give IV glucose – 2 ml/Kg 10% Dextrose

Give IV calcium gluconate 2ml/kg over 10m.

Give Anticonulsant:-Phenobarb.20mg/kg in
20min, Repeat @10mg/kg till 40mg/kg

Seizure Continues, Give Pheytoin 20mg/kg in
20 minute

Management of Seizure beyond 2 Weeks of Age

Follow same A B C D till AED

Control of Convulsion

Diazepam IV @ 0.25mg/kg,

Per Rectally @0,5mg/kg, Easy

Repeat after 10m. If required

Continue same Phenobarb, Phenytoin

---Pyridoxine 100mg IV-----Mag.Sulph 50mg

IM or 2-3mg/kg IV----Other AED----

Thiopental

Principles of Epilepsy Therapy

- Complete control Vs Reduction in Frequency
- Identification the seizure type accurately
- Initiation with single drug
- Consider least toxic, Easy to administer, Affordable drug
- Proper dosage before considering adding second drug

Drug Treatment

GTCS

1. Phenytoin (4-6 mg/Kg/D)
2. Carbamazepine (20-30mg/Kg/D)
3. Valproate Sodium (20-40mg/Kg/D)
4. Phenobarbitone (4-6mg/Kg/D)

Drug Treatment

- Partial

Carbamazepine

Valproate

Phenytoin

Lamotrigine

Gabapentin

Drug Treatment

ABSENCE SEIZURE

1. Ethosuximide (20-40mg/Kg/D)
 2. Methsuxamide
 3. Valproate
 4. Clonazepam (0.1-0.2mg/Kg/D)
- Myoclonic
1. Valproate
 2. Clonazepam

Duration of Therapy

- Individualised
- At least 2-3 years after last episode
- Some children may need prolonged therapy

Other Considerations

- Psychological
 - Care of children
 - How to discipline and prevent spoiling
 - Effect on other siblings
- Ketogenic Diet
- Surgical Management

SUGGESTED READING

- IAP Text Book of Pediatrics
Fifth Edition

Nelson Text Book of Pediatrics
Twentieth edition

Clinical Pediatrics

NC JOSHI Second edition

Thank you

QUESTIONS

- What is seizure ?
- Define Epilepsy. Classify Epilepsy.
- What are pseudo seizures?
- How will you manage a child with GTCS ?
- How will you manage a newborn with seizure ?
- Define status epilepticus. How will you manage it in a PHC set up?