Epilepsy in childhood

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What Is Epilepsy?

- **Recurrent fits(siezures,convulsions)**

unrelated to fever or to an acute cerebral insult

- **What is a fit/seizure?- An epileptic seizure (fit/convulsion) is the clinical manifestation of an abnormal & excessive discharge of a set of cerebral neurons.**

What Is Epilepsy

- **Clinical manifestations – sudden & transient motor, sensory or psychic event with or without loss of consciousness**
- **The symptoms depend on the part of the brain the discharge originated from**

Evaluation of a child with a fit

Detailed history is very important

- **Eye witness report of the event**
- **Time of day**
- **Events prior to the seizure-precipitating factors**
- **Aura –epigastirc discomfort–”feeling funny”**
- **Focal or generalized?**

History

Description of the seizure – request the eyewitness to enact the episode

Motor component-

- **Tonic- increased tone or rigidity**
- **Clonic – rhythmic muscle contraction & relaxation.**
- **Atonic – flaccidity or lack of movement**
- **Myoclonic – shock like contraction of muscles**

History

- Associated loss of sphincter control?
- Duration of the seizure?
- Loss of consciousness or not?
- Post ictal phase – sleep/ headache?
- Frequency of the seizure?

Examination

EXCLUDE AN ORGANIC CAUSE

- Check blood pressure
- OFC – microcephaly/ hydrocephalus
- Dysmorphic features
- Hepatosplenomegaly
- Examine the skin – Hypo pigmented/ café-au-lait/shagreen patches, adenoma sebaceum, phakomata of eyes

Examination- exclude an organic cause

Detailed neurological examination

- **Funduscopy – papilloedema, retinal haemorrhages, chorioretinitis**

- **Hyperventilation during examination- induces the seizure in absence seizures**

Classification

Important to classify the seizure type

WHY?

- **Provides a clue to the cause**
- **Prognosis**
- **To choose the most appropriate therapy.**

International Classification of Epilepsy

- **Partial seizures**
- **Generalized seizures**
- **Unclassified**

International Classification of Epilepsy

Partial seizures

- **Simple partial – consciousness retained motor/sensory/ autonomic/ psychic phenomena**
- **Complex partial seizures- consciousness impaired at onset**
- **Partial seizures with secondary generalization**

International Classification of Epilepsy

GENERALIZED SEIZURES

- Absences typical/atypical
- Generalized tonic/clonic
- Tonic
- Clonic
- Myoclonic
- Atonic
- Infantile spasms

Partial seizures

Simple partial (SPS)

- Aura – chest pain, headaches
- Motor activity –

Asynchronous clonic or tonic movements of face & neck. Conjugate eye movements

- Duration – 10-20 seconds
- Remains conscious and may even talk during the fit. No post ictal phenomena.

Partial seizures -Simple Partial Seizures

- **May be confused with tics – involves the face and shoulders. Eye blinking facial grimacing. Tics may be suppressed.**

- **Treatment – Sodium valproate or carbamazepine**

Partial seizures – Complex Partial Seizures

Complex partial seizures CPS

3 Components

- **Aura**
- **Altered consciousness** motor arrest- vacant stare, motionless. Associated spasms, posturing or tonic jerking.
- **Automatisms**

Partial seizures –Complex partial Seizures

Automatisms - involuntary motor acts occur during or after the seizure

- **Chewing lip smacking**
- **Laughter, fear anger**
- **Walking, patting, rubbing**
- **Meaningless words, violent behaviour**

In 60% of cases onset is from the Temporal lobe. 30% - frontal lobe

Partial seizures - Complex partial Seizures

- **EEG – anterior temporal lobe sharp waves or focal/multi focal spikes**
- **CT scan – mesial temporal sclerosis, hamartomas, infarctions, slow growing gliomas etc.**

- **Treatment – sodium valproate, carbamazepine.**

Partial seizures – Benign partial epilepsy of childhood

- Common in childhood & has an excellent prognosis
- Occurs between 2- 14years
- Neurologically normal children
- Positive family history
- Commonly occurs during sleep

EEG - repitative spike focus localized to the centro temporal or Rolandic area.

Treatment - carbamazepine

Generalized seizures

Absences

Simple typical absences - petit mal

- **Sudden cessation of of motor activity and speech. Flickering of eye lids. No aura. Lasts around 30 sec.**

No post ictal phase. In contrast to CPS. After the seizure the child continues the activity he/she was doing before.

Hyperventilation will induce the fit.

Generalized seizures -Absences

- **EEG 3/sec. Generalized, spike and waves**

- **Treatment – Soduim valproate or ethosuximide**

Generalized seizures

Generalized tonic- clonic seizures

- **Common . May follow a partial seizure which becomes generalized or occur as a generalized seizure from the beginning.**
- **Aura may be present. Sudden loss of consciousness or shrill cry. Eyes roll back, tonic contraction of body, apnoea & cyanosis. Clonic phase. Loss of sphincter control. Abrupt end.**

Generalized seizures -Generalized tonic – clonic seizures

- **Semiconscious. Post ictal phase for 30 min.- 2 hours. Deep sleep.**
- **During this phase – truncal ataxia,**

  hyperactive deep tendon reflexes, clonus extensor planter responses.
- **Vomiting and headache may occur.**
- **When no cause is identified – idiopathic epilepsy. May be precipitated by fever, stress or fatigue, drugs-psychotrophics, theophylline, methyphendiate.**

Generalized tonic -clonic seizures

- **EEG – Generalized high voltage slow waves.**

- **Treatment – sodium valproate or carbamazepine**

Generalized seizures

Infantile spasms

- **Usually starts in infancy between 4-8 months.Contraction of neck trunk and limbs.**
- **Three types – Flexor, extensor and mixed.**
- **Common flexor(Salam attacks) – sudden flexion of neck arms and legs onto the trunk. Each episode very brief.Occurs in clusters. A cry may precede or follow the fit.**
- **Usually occurs during falling a sleep or on waking up.**

Generalized seizures -Infantile spasms

- **Symptomatic – Prenatal, natal or post natal abnormalities. Birth asphyxia, prematurity,congenital infections, neurocutaneous syndromes Tuberous sclerosis.**
- **Cryptogenic type – good prognosis**
- **Symptomatic type 80-90% mental retardation.**

Infantile spasms

- **EEG – chaotic pattern of high voltage bilaterally asynchronous slow wave activity –hypsarrhythmia mountainous pattern**
- **CT scan**
- **Treatment – ACTH/ prednisolone**

sodium valproate, clonazepam, vigabatrin.

Management of Epilepsy

- **Investigations**
- **EEG - Inter- ictal EEG may be normal in 40%**
- **Activation procedures – hyperventilation photic stimulation should be tried when indicated**
- **Patients who are on anticonvulsants should continue on therapy as usual prior to the planned EEG**

Management of Epilepsy

CT/ MRI SCAN

- Suspicion of an intra cranial lesion
- Complex partial seizures
- Presence of focal neurological signs during or after the seizure
- Increasing severity or frequency
- Changing seizure pattern

Management of epilepsy

- **Establish that it is a seizure disorder**
- **If it is the first fit in a health child, neurological examination/ EEG, blood sugar & serum calcium - normal– wait and see**
- **70% of such children will not develop another fit**
- **If another fit occurs in a short space of time – anticonvulsants should be started**

Management of epilepsy

What anticonvulsant?

- **Should be determined by the history & EEG findings**
- **Goal – use of only one drug with the fewest possible side effects for the control of the fits**
- **The drug is started at a lower dose & increased to the recommended therapeutic dose until the fits are controlled or side effects develop**

Management of Epilepsy

If seizure control is not achieved with one drug

- **Check Compliance,dosage, and if the right drug is being used for the seizure type.**
- **If a second drug has to be added gradually introduce the 2nd drug & when recommended dose is achieved tail off and stop the first drug.**
- **It more than one drug is needed consider drug interactions**

Management of Epilepsy

Recommended dosages –

- **Sodium valproate –start with 10mg/kg/day & increase to 30-60 mg /kg/day**
- **Carbamazepine start with 10mg/kg per day and increase to 20-30 mg/kg/day**
- **Monitoring of blood levels**

Management of Epilepsy

- If complete seizure control is achieved by an anticonvulsant, for a 2 year period, therapy could be tailed off and stopped if there are no other risk factors.
- Risk factors – onset <12years, neurological dysfunction – CP/MR, history of neonatal seizures, several seizures prior to control
- Best prognosis – Benign Rolandic epilepsy and idiopathic generalized seizures

Management of Epilepsy

Counseling of parents

- Aetiology, prognosis,
- Importance of compliance of therapy and the side effects
- Fist aid measures, parents & teachers
- Avoidance of over protection & sensible advice regarding supervision during bathing swimming etc.
- Most are of normal intelligence but monitoring of academic performance is important

Febrile convulsions

- **Most common seizure disorder in childhood extremely good prognosis**
- **Occurs between 5 months & 6 years of age**
- **A fit occurring with fever under 5 months or after 6 years should not be labeled as a febrile convulsion.**

Febrile convulsions

- **A convulsion associated with fever in a child aged between 5 m and 6 years, without evidence of underlying CNS infection**
- **Occurs in 3% of all children**
- **Important to exclude underlying CNS infections meningitis/encephalitis**
- **Find a cause for the fever**
- **Typical or atypical FC?**

Febrile convulsions

Atypical febrile convulsion-

- **Lasts longer than 15 min.**
- **More than one episode in a 24 hour period**
- **Focal seizures**

A complete diagnosis should be made – Eg. - Typical/atypical febrile convulsion secondary to viral upper respiratory tract infection.

Any suspicion of meningitis /encephalitis – lumbar puncture should be performed

Febrile convulsions

Management

- First aid measures
- Talking to parents. Benign condition. Risk of recurrence – higher male sex, young age and with a positive family history.
- Prevention – temperature control- keep antipyretics (paracetamol) at home and measures to reduce fever. Removal of clothing. Tepid sponging.
- Parents should be taught first aid measures in managing a fit

Febrile convulsions

- Left lateral position
- Loosening of clothing
- Do not put anything in the mouth

Prevention – no long term anticonvulsants

Oral diazepam prophylaxis during a febrile illness. 1mg/kg per day in 3 divided doses for 2-3 days of the febrile illness.

Emergency Management of a fitting child

- **Status epilepticus - repetitive or continuous seizures lasting<30 minutes without recovery of consciousness.**
- **Most seizures in children end spontaneously or can be controlled before status epilepticus occurs.**

Emergency management of a fitting child

Causes –

- Prolonged febrile convulsions
- Idiopathic status epilepsy
- Symptomatic status epilepticus seizure occurs as a result of an underlying metabolic abnormality

Emergency management of a fitting child

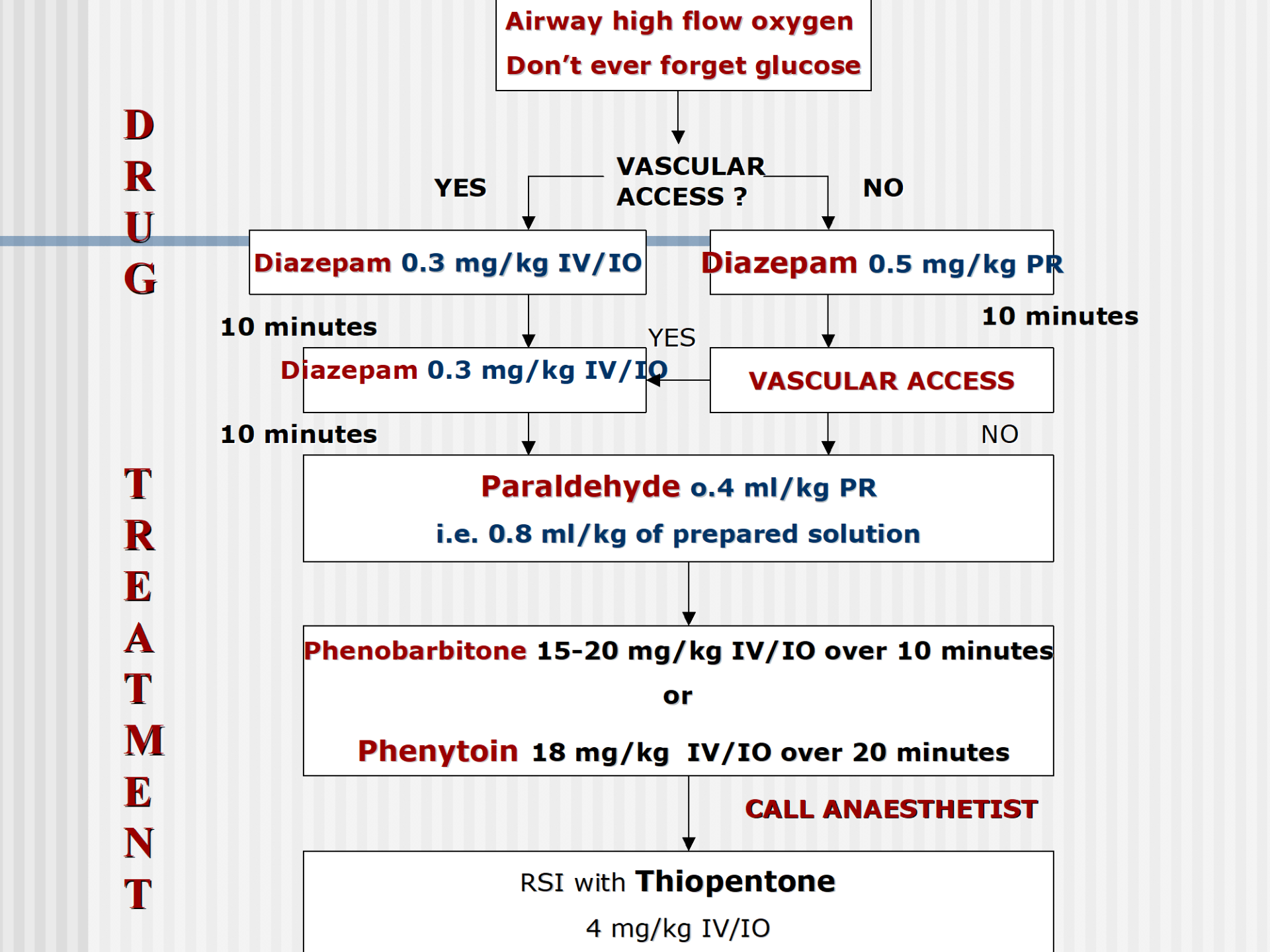
Management

- Ensure patent airway
- Administer 100% oxygen
- Establish vascular access

- Position in left lateral position and position head. Suck out secretions

Emergency management of a fitting child

- Monitor with pulse oximeter – ambu bag/ endotracheal intubation
- Check blood sugar – if hypoglycaemic correct with 5 ml/kg of 10% dextrose. Check serum electrolytes including calcium
- Drug treatment -


DRUG TREATMENT
Airway high flow oxygen
Don't ever forget glucose
VASCULAR ACCESS ?
YES
NO
Diazepam 0.3 mg/kg IV/IO
Diazepam 0.5 mg/kg PR
10 minutes
10 minutes
YES
Diazepam 0.3 mg/kg IV/IO
VASCULAR ACCESS
10 minutes
NO
Paraldehyde o.4 ml/kg PR
i.e. 0.8 ml/kg of prepared solution
Phenobarbitone 15-20 mg/kg IV/IO over 10 minutes
or
Phenytoin 18 mg/kg IV/IO over 20 minutes
CALL ANAESTHETIST
RSI with Thiopentone
4 mg/kg IV/IO

Differential diagnosis of seizures

- Syncopal episodes
- Benign paroxysmal vertigo
- Breath holding episodes
- Pseudo seizures