Neonatal seizures

Neonatal seizures eHandbook

Key messages

- Neonatal seizures are relatively common
- Seizures must be differentiated from jitteriness and benign neonatal sleep myoclonus
- There are four different types of clinical seizures
- 70 per cent of seizures will abate with phenobarbitone.

Neonatal seizures

- Neonatal seizures are paroxysmal alterations in neurological function
- This definition allows the inclusion of clinical seizures associated with EEG abnormalities as well as paroxysmal clinical activities (such as lip smacking and cycling) that are not associated with EEG alteration
- In the majority of cases a cause should be found

- *What are the common causes of seizures in neonates?*

CAUSES

- Ischaemia (50%)
  - HIE (hypoxic ischaemic encephalopathy)
- Vascular event/ Infarction (12%)
  - CVA
- Cerebral Trauma (7%)
- Infection (5%)
  - Meningoencephalitis
  - TORCH
- Metabolic
  - Hypoglycaemia
  - Inborn errors of metabolism
- Electrolyte abnormalities
  - Na/Mg/Ca…
- Drug withdrawal
  - NAS
- CNS malformation
  - Congenital

4 types of neonatal seizures

1. Subtle
2. Clonic
3. Myoclonic
4. Tonic

Subtle neonatal seizures

- Lip smacking

- This video shows the ORAL type
  - Chewing
  - Lip smacking
  - sucking

Subtle neonatal seizures

- Subtle limb seizures
- This shows the LIMB variant with
  - Cycle
  - Swimming
  - Rowing movements

Subtle neonatal seizures

- Eye seizures

- EYE seizures
  - Deviation
  - Blinking
  - Staring

Subtle neonatal seizures

- SYSTEMIC seizures manifest as alterations in
  - Breathing – apnoea
  - CVS – BP/HR - eg tachycardiac/ hypo/ pertension

CLONIC seizures

- Focal clonic seizure
  - Usually one limb or one side of the body jerking rhythmically at 1-4 times per second
  - Consciousness usually preserved
  - Aetiology more commonly haemorhage / infarction (focal pathology)

MYOCLONIC seizures

- neonatal myoclonic seizures

- Rapid isolated jerking of muscles
- May be focal or multifocal
- Seen in drug withdrawal (especially opiates)
- If it occurs during sleep then it is probably 'benign neonatal sleep myoclonus'.
- Can also occur in a very severe form of encephalopathy.

TONIC seizures

- Tonic seizure

- Sustained posturing of the limbs or trunk or deviation of the head
- It may mimic decerebrate or decorticate posturing
- Only 30% have EEG correlates
- Can be difficult to treat with anticonvulsants

Differential diagnoses

Jitteriness

- neonatal jitteriness

- Symmetrical rapid movements of the hands and feet
- Stimulus sensitive and may be initiated by sudden movement or noise
- No associated eye movements
- Movements cease when limb held.

Benign neonatal sleep myoclonus

- BNSM 1
- BNSM 2

- Bilateral or unilateral jerking during sleep
- Occurs during active sleep
- Not stimulus sensitive
- Often involve upper > lower trunk.

Case

- You are asked to review a baby on the ward – the staff are unsure if the baby is jittery or having seizures
- *What information do you want to assist your assessment?*
- *What will you look for in the examination?*
- *What investigations should be undertaken?*

History

- Maternal health
  - Pre-existing conditions eg epilepsy
  - Drugs/ substance misuse
- Obstetric history
  - Diabetes; Pre-eclampsia
  - Medication
  - TORCH
  - Gestation
  - Sepsis risk factors esp HSV
- Delivery
  - Trauma/ ischaemia
    - ? US/ CTG/ cord gas
- Baby since delivery
  - Feeding
  - Wakefullness
  - Suck
  - Lethargy
  - Other movements

Examination

- Dysmorphic features
- Weight/ ofc/ length & observations
- Full examination including head shape/ bogginess
- Neurological examination
  - Wakefullness/ stupor
  - Reflexes eg suck/ Moro
  - Tone, power
  - Symmetry

Earlier SENIOR review

Investigations

- BSL/TBG
- UEC, Ca, Mg
- BC,FBE, CRP (? LP)
- Gas including lactate
- Cranial US

- Consider PIPER re: need for EEG/ MRI

Management

SENIOR INVOLVEMENT

- Admit to SCN
- Observations and monitoring including BP
- Treat the cause eg for hypoglycaemia etc

- **Anticonvulsant** should be commenced if the seizure is prolonged (longer than three minutes), frequent (> 2-3 per hour), or associated with cardiorespiratory disturbance.

Anticonvulsant	Loading dose	Maintenance	% infants controlled
Phenobarbitone	20 mg/kg IV or IM over 30 minutes *	2.5-5 mg/kg 12-hourly, 24 hours after the loading dose	70%
Phenytoin	15 to 20 mg/kg IVI over at least 30 minutes	4-5 mg/kg/dose 12-hourly in term infants starting 12 hours after the loading dose	85%
Midazolam	0.15 mg/kg over 5 minutes	Infusion: 60-400 micrograms/kg/hour	
Clonazepam	0.1 to 0.25 mg IV (**not** per kg)	0.01 mg/kg/dose 8 hourly, 8 hours after the loading dose	90-100%
Lignocaine	2 mg/kg IV over 10 minutes	Infusion: 6 mg/kg/hour for 6 hours, 4 mg/kg/hr for 12 hours, 2 mg/kg/hr	Do not use with Phenytoin
Pyridoxine **	100 mg IV or IM	50 mg daily	