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Convulsions in the newborn:

The incidence of neonatal seizures in the United States has not been clearly established, although an estimated frequency of 80-120 cases per 100,000 neonates per year has been suggested. The incidence of seizures is higher in the neonatal period (ie, the first 4 wk after birth) than at any other time of life.

The occurrence of neonatal seizures may be the first, and perhaps the only, clinical sign of a central nervous system (CNS) disorder in the newborn infant. As such, seizures may indicate the presence of a potentially treatable etiology and should prompt an immediate evaluation to determine cause and to institute etiology-specific therapy. In addition, seizures themselves require emergent therapy, since they may adversely affect the infant's homeostasis or contribute to further brain injury.

In 24 century incidence ranges from 1.5 to 5.5 per 1000 in newborns and may be even higher in premature infants Seizure incidence varies with some specific risk factors. Occurrence increases with decreasing gestational age and birth weight, and with increasing acuity of illness

Age-related demographics

Neonatal seizures by definition occur within the first 4 weeks of life in a full-term infant and up to 44 weeks from conception for premature infants. Seizures are most frequent during the first 10 days of life.

DEFINE neonatal seizures /Convulsions

clinically as a paroxysmal alteration in neurologic function, i.e. behavioural, motor, or autonomic functions, or all three. They can be difficult to diagnose as they are often subtle and can be missed.

Management:

- convulsion is always a medical emergency;
- Gentle handling and hand washing
- AVOID Unnecessary time wastage
- Ensure the baby has a clear airway and adequate ventilation, either spontaneous,
- Manage then convulsion first; then obtain the history.
- Ensure that the baby is having a convulsion or a spasm

and is not just jittery.

- btain help, preferably including from a doctor .
- Place baby in a semi-prone position, with head in neutral position.
- Gentle oral and nasal suction of secretions if required
- Facial oxygen if baby breathing spontaneously but cyanosed
- May need IV access
- Document the nature of the convulsion, the length, the

type of movement, the areas affected, colour change,

any change in vital signs

· Ongoing monitoring and observations of vital signs and

behaviour

· Anticonvulsant therapy is required for management of

ongoing convulsions.

Anticonvulsant therapy:

Phenobarbital IV by very slowly injection is the primary medication used to manage neonatal convulsions or seizures.
This will be discussed in more detail in tomorrow's lesson.
The other part of the management is to treat the primary cause of the seizures if that is possible.

Treatment of the primary cause of convulsion (seizure):

- **If Hypoglycaemia is the cause of the seizures:**

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- **If Hypocalcaemia is the cause of seizure:-**

Give 1 to 2 ml of Calcium Gluconate 10% IV slowly over 5 minutes. Repeat dose in 10 minutes if there is no clinical response. - Remember, if calcium is injected rapidly, fatal cardiac complication may develop.

- **If Hypomagnesaemia is the cause of seizure:**

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Give 0.1 to 0.2 ml/kg of magnesium sulphate 50% IV
(slowly) or IM.

- **If Infection is the suspected cause of seizure:**

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If septicemia and/or meningitis is suspected, treat with recommended antibiotic. Maintain adequate dose and duration.

- **Perinatal asphyxia and intracranial haemorrhage:**

- After initial stabilization, refer the baby to a higher level centre.
- Please ensure warmth, feeding and if necessary oxygen during transport to higher level centre.

Anticonvulsant therapy for management of ongoing convulsion.

1. **Phenobarbital**– 20mg/kg/stat dose IV very slowly over five minutes. If the I/V line can't

be established, give the same dose by I/M. injection. If the convulsion doesn't stop within
30 minutes, give another dose of 10mg/kg. Repeat one more time after another 30 66 minutes, if necessary.

2. If convulsion continues or if it recurs within 6 hours, give **Phenytoin** 20mg/kg by I/V infusion mixing the drug with 15 ml of normal saline and infuse over 30 minutes. **Use only normal saline for mixing**, as all other fluid will crystallize Phenytoin.
3. Diazepam 0.5 mg/kg/dose per rectally or 0.2 mg/kg/dose I/V can only be tried if Phenobarbital is not available. One note of caution: do not use diazepam in addition to Phenobarbital as it may increase the risk of circulatory collapse and respiratory failure. If the baby has central cyanosis (blue tongue and lips) or other signs of breathing difficulty, give oxygen at a moderate flow rate.
4. If convulsions recur within two days; give Phenobarbital 5mg/kg/day once daily orally until the baby has not had a convulsion for seven days.
5. If the convulsion recurs after two days without convulsions, repeat treatment with Phenobarbital as described for initial management of convulsions and again follows with Phenobarbital 5mg/kg once daily orally until the baby remains convulsion free for seven days.
6. Once Phenobarbital is discontinued, observe the baby for an additional three days.

7. Establish an IV line and give fluid at maintenance volume according to the age of the baby for first 12 hours: 60 ml/kg 1st day .80 ml/kg 2nd day 100 ml/kg 3rd day . 120 ml/kg 4th day .140ml/kg 5 th day .150ml/kg from 6th day onwards

Treatment of the cause of convulsion:

If Hypocalcaemia is the cause of seizure:
Hypocalcaemia: Give 1 to 2 ml of calcium gluconate 10% IV slowly over 5 minutes. Repeat
dose in 10 minutes if there is no clinical response. Remember, if calcium is injected rapidly,
fatal cardiac complication may develop.
Hypomagnesaemia: Give 0.1 to 0.2 ml/kg of magnesium sulphate 50% IV (slowly) or IM Infections

If septicemia and or meningitis suspected, treat with recommended antibiotic. Maintain adequate dose and duration.
Perinatal asphyxia and intracranial hemorrhage
After initial stabilization, refer the baby to higher centre. Please ensure warmth, feeding and if necessary oxygen during transport to higher centers.

Summary of Anticonvulsant therapy:
IV phenobarbitone (20mg/kg) slowly @ 1mg/kg/min
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If uncontrolled
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Repeat phenobarbitone 20mg/kg
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If uncontrolled
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Phenytoin 20mg/kg diluted in normal saline @ 1mg/ min
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If uncontrolled
↓
Repeat dose of phenytoin 10mg/kg
↓
If uncontrolled
↓
Diazepam drip/ paraldehyde
Other drugs such as Lorezapam, midazolam and carbamazepine have also been found to be
effective.
Duration of anticonvulsant therapy: Anticonvulsants may be stopped after seizures have been
absent for 2 weeks.
Pyridoxine dependency: Suspect if seizures are refractory. Give 100 mg IV as a single test
dose, followed by a 30 min observation period. If a definite response is seen, begin maintenance of 50- 100mg orally daily68

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