NEONATAL SEIZURES

Additional equipment to consider:
- CFM
- Anticonvulsants: phenobarbitone, phenytoin, midazolam
- i-STAT machine
- Cooling equipment

**IMMEDIATE – Treat as time critical**

Prolonged or repeated seizures may lead to irreversible brain injury. It is important to stop ongoing seizures, to treat reversible factors and identify underlying causes.

Initial assessment: ‘first check ‘ABC’ for immediately life threatening features = ACT FIRST, STORY LATER
- Review antenatal and family history: Maternal drug history, antenatal scans, maternal illness
- History of labour and delivery: risk factors for sepsis, condition at birth, need for resuscitation.
- Time course of presentation and predominant symptoms/signs: Focal / general, duration of seizure episodes.
- Management to date and rationale for therapeutic decisions. Review examination, blood results and radiology.
- ABC: Current clinical parameters and progression: RR, HR, MBP, pulses, perfusion, saturations, UO
- ABCDEF: temp, acidosis, lactate, BS, electrolytes Ca, Mg, Hb, bill, neurology: awake / obtunded, pupils, focal signs, fontanelle, reflexes.
- F= family: Where are parents, what have they been told, what are they expecting to happen?
- Assess need for further urgent intervention (see below)

Respiratory support
- If apnoea, or significant compromise / interruption of vital signs: intubate and ventilate.
- If ventilated, give analgesia with morphine. Consider sedation & muscle relaxation with CFM monitor

Cardiovascular
- Establish secure IV access.
- Establish invasive arterial monitoring (if possible, but not essential) – UAC, peripheral arterial line.
- Correct significant hypotension with volume bolus, inotropes [Discuss with supervising consultant]

Other considerations
- Check blood cultures have been taken and appropriate antibiotics given. Consider need to add acyclovir?
- Correct hypoglycaemia* and significant electrolyte imbalances. (*3 mls/kg 10% dextrose.)
- Instigate measures to stop ongoing seizures - see below
- Review differential diagnosis and consider instigation of further investigations and potential therapeutic interventions. [see table] (eg; ammonia, lactate, amino acids, urine for organic acids, drug screen, ketones, brain imaging)
- Formulate management plan and discuss with supervising consultant

Anticonvulsant regime:

1. Treat reversible causes eg: hypoglycaemia, electrolyte imbalance, NAS
2. Phenobarbitone iv 20mg/kg over 20 mins
3. Phenobarbitone iv 10mg/kg over 10 mins
4. Phenytion 20mg/kg over 60 mins (do not give with dextrose)
5. Consider need to intubate and ventilate
   Midazolam 50 micrograms/kg bolus over 10 mins followed by infusion of 150 – 250 micrograms/kg/hr
6. Other measures: Lidocaine, pyridoxine, folinic acid Discuss with Paediatric Neurologist.

Differential diagnosis
- Hypoxic ischaemic encephalopathy
- Infection
  - congenital infection
  - acquired early or late onset sepsis
- Hypoglycaemia
- Drug withdrawal
- Kernicterus
- Electrolyte disturbances
  - hypo / hyper natraemia
  - hypocalcaemia
  - hypomagnesaemia
- Intracranial injury
  - focal ischaemia (neonatal stroke)
  - intracranial haemorrhage
- Congenital cerebral malformations
- Inborn errors of metabolism
- Benign

References: WHO guidelines on neonatal seizures: www.who.int/iris/bitstream/10665/77756/1/9789241548304_eng.pdf

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