Neonatal Sepsis

Neonatal sepsis eHandbook

Sepsis

- Any baby who is unwell must be considered at risk of sepsis – 1 in 8 per 1000 lives births
- The consequences of untreated sepsis are devastating - 10-30% risk of mortality
- Commence antibiotic treatment as soon as possible after taking cultures
- Do not delay treatment if you cannot obtain cultures

What are the risk factors for sepsis?

Risk factors
**Important to assess these for any baby <28 days **

MATERNAL

- Maternal fever/ infection/ chorioamnionitis
- GBS+ (swab, urine or previous infant)
- PPROM (preterm premature rupture of membranes
- sPROM 18 hours (prolonged rupture of membranes) – *some hospitals use 24 hours*
- *Multiple obstetric procedures e.g. cervical sutures*
- HSV status
- ? Mother received antibiotics

FETAL

- Premature
- VLBW (very low birth weight)
- Fetal distress
- Congenital anomalies eg Ureteric (predispose to UTI
- Indigenous mothers and babies have higher risk of sepsis

What are the symptoms and signs of sepsis?

Symptoms and signs

- Lethargy/ quiet/ dislikes handling
- Poor feeding
- Tachycardia/ hypotension
- Apnoea/ tachypnoea/ work of breathing
- Seizures
- Fever/ Hypothermia/ temperature instability
- Pallor
- Jaundice
- Rash
- Bulging fontanelle
- “not quite right”

See the neonatal handbook for the full list of symptoms and signs

Which organisms most commonly cause sepsis in our population?

Organisms

- BACTERIA (GBS and gram neg are 80% of cases in early onset)
  - GBS
  - Ecoli/ other gram negatives
  - Other Strep eg enterococcus; group A
  - Listeria
  - Staph aureus; MRSA
- VIRUSES
  - HSV (more common >d5)
  - Enterovirus

Early onset sepsis <48 hours of life

- Often manifests with pneumonia and/or septicaemia
- There is a high risk of mortality
- Sepsis at this time is predominantly due to organisms acquired from the birth canal
- Occasionally intrapartum haematogenous spread occurs such as listeria

Late onset sepsis >48 hours

- Organisms acquired either around the time of birth or in hospital
  - > 70 per cent due to coagulase-negative *Staphylococcus* and *Staphylococcus aureus*
  - 10-15 per cent due to Gram negatives
  - Gram-negative organisms and GBS predominate among infections acquired outside the NICU setting
- Mortality rate approximately 5 per cent

You are asked to review a baby on the postnatal ward

Baby is 7 hours old, 37, IOL for poor growth and weight 2.8kg. Born via forceps delivery due to prolonged 2nd stage. No resus needed. GBS + and had mother had 2 doses of Benpen

The staff are worried as the baby has a respiratory rate of 80.

What is your approach and management of this patient?

Intrapartum antibiotics are given according to the following strategies.

If screening is performed administer to:

- GBS colonised women
- non-colonised women with risk factors present.

If screening is not performed administer to women with these risk factors:

- preterm onset of labour (< 37 weeks)
- ROM for > 18 hours
- maternal fever (> 38C)
- previous baby with invasive GBS disease
- GBS bacteriuria this pregnancy.

Use of the CDC guidelines is estimated to result in around 27 per cent of women receiving antibiotics, with an associated reduction in early onset GBS disease of around 85 per cent.

Case

- Assess for risk factors in mother and baby
- Examine for symptoms and signs of sepsis
- Early discussion with SENIOR
- Admit to SCN for observation, monitoring and treatment if suspicion of sepsis

Case

- Investigation
  - FBE, CRP, BC, gas, glucose/ TBG
  - CXR
  - LP if stable
  - *Urine (more useful in late onset)*
- Mangement
  - A,B,C – respiratory/ cvs support as needed
  - Consider fluid bolus (10ml/kg 0.9% saline)
  - Correct hypoglycaemia
  - Benpen and Gentamicin (? Likehood of other organisms?)? Cefotaxime if suspicion of meningitis
    - DO NOT DELAY IF DIFFICULT TO GET BC/ IV ACCESS AS FIRST DOSE CAN BE IM

Non-specific markers C-reactive protein (CRP):

- CRP rises approximately 12 hours after onset of sepsis and returns to normal within two to seven days of successful treatment.
- If the CRP remains elevated or rises after initial improvement care must be taken to look for possible collections, including endocarditis (particularly if 'long-lines' have been used) or fungal infection.
- CRP is raised in 85 per cent of episodes of confirmed sepsis with a specificity of 90 per cent.
- It can therefore be normal in cases of true sepsis and should be used in conjunction with clinical signs and culture results.

At least 2 CRPs are useful (12 hours apart) to detect clinical change. If these are normal in the presence of a negative blood culture and clinically well baby – consider ceasing antibiotics

Full blood examination (FBE)

- The polymorphonucleocyte (PMN) count can be normal in one-third of cases of confirmed sepsis but can also be elevated in the absence of infection.
- Neutropenia in the face of confirmed sepsis can indicate that the baby is extremely unwell.
- A raised immature to total white cell ratio (I:T ratio > 0.3) is about 85 per cent sensitive and specific - particularly for early-onset sepsis.

IT ratios are not easily available at BHS currently – a toxic film/ left shift on film can be useful

When should antibiotics stop?

- When to stop anitbiotics
- Depends on diagnosis (mengitis v sepsis)
- Depends on organism

Preventing nosocomial infection

- **Postnatal prevention of infection**
- Handwashing
  - Set an example
  - Enforce culture, including with parents
  - At least 3 ml of ‘soap’
  - Enough chlorhex : 20seconds kill time for most bugs