

SUMMARY OF DRAFT NICE GUIDELINE ON EARLY NEONATAL INFECTION

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Risk factors for infection

- Pre-labour rupture of membranes
- Preterm birth (<37 weeks), especially with pre-labour rupture of membranes
- Confirmed or suspected chorioamnionitis it is (e.g. intrapartum fever)
- Invasive GBS infection in a previous baby
- Antibiotic treatment given to mother for confirmed or suspected invasive bacterial infection 24 hours before, during, or 24 hours post labour

Clinical Indicators Suggestive of Infection

- Altered behaviour or responsiveness
- Altered muscle tone
- Feeding difficulties (e.g. feed refusal)
- Feed intolerance (e.g. abdominal distension, vomiting)
- Altered heart rate
- Signs of respiratory distress
- Oxygen desaturation
- Apnoea
- Signs of perinatal asphyxia or hypoxic ischaemia
- Seizures
- Need for mechanical ventilation (especially term baby)
- PPHN
- Temperature abnormality not explained by environment
- Signs of shock
- Unexplained bleeding disorder (e.g. thrombocytopenia, INR <2)
- Oliguria
- Hypo/hyperglycaemia
- Metabolic acidosis (BE -10 or greater)
- Local signs of infection e.g. skin, eyes
- Confirmed or suspected sepsis in a co-twin

Red Flag Signs Suggestive of Neonatal Infection

- Systemic antibiotics given to mother for suspected bacterial infection within 24 hours of birth
- Seizures
- Signs of shock
- Need for mechanical ventilation in a term baby
- Suspected or confirmed infection in a co-twin

Actions

- Any red flags or no red flags but 2 or more risk factors or clinical indicators
 - Perform investigations including blood cultures and start antibiotics

- No red flag or clinical indicators but one risk factor or no red flags or risk factors but one clinical indicator
 - Use clinical judgement and consider withholding antibiotics
 - Monitor baby for clinical indicators of possible infection, including the vital signs
 - Monitor for at least 12 hours from birth (at 1 hour, 2 hours and then 2 hourly for 10 hours)
 - If further clinical concerns perform investigations including blood cultures and start antibiotics
- If a decision is made to give antibiotics aim to start within 30 minutes and always within 1 hour of the decision

Investigations Before Starting Antibiotics

- Blood culture (in all)
- LP (if it is thought safe to do)
 - If there is a strong clinical suspicion of infection or signs/symptoms suggestive of meningitis
 - if doing the LP will delay antibiotics, give the antibiotics first
- Do not do urine MC&S as part of investigation of systemic early onset sepsis
- Do not take skin swabs in absence of clinical signs on localised infection
- Purulent eye discharge may indicate a serious infection e.g. chlamydia or gonococcus
- If purulent eye discharge
 - collect eye swabs for urgent MC&S especially looking for chlamydia or gonococcus
 - start systemic antibiotics whilst awaiting results
- If signs of umbilical infection, including purulent discharge or periumbilical cellulitis perform a blood culture and start INV flucloxacillin and gentamicin

Choice of Antibiotics

- Use benzyl penicillin and gentamicin as first choice for empirical treatment of suspected infection
- Benzylpenicillin
 - 25mg/kg 12 hourly
 - 50mg/kg 12 hourly if baby appears very ill
- Gentamicin
 - 4.5 mg/kg
 - If a second dose is to be given (see below) give 36 hours after the first dose
 - The interval may be shorted based on clinical judgement e.g. for gram -ve infection or if the baby appears very ill
 - See below for monitoring of gentamicin

Investigations during Antibiotic Treatment

- CRP
 - Measure at 8-16 hours after presentation and again 18-24 hours after first measurement
- LP consider if
 - CRP > 10
 - Positive blood culture
 - Low WCC or neutrophils (if measured)
 - Baby does not respond satisfactorily to antibiotics

Duration of antibiotic treatment

Consider stopping after 36 hours if initial clinical suspicion of infection was not strong and

- CRP < 10mg/l on both tests

and

- Blood culture is negative

and

- the baby is well with no clinical indicators of possible infection

Treat for 5 days if

- Strong clinical suggestion of infection
- Continued clinical concerns about infection at 36 hours
- CRP > 10 mg/l on either measurement
- Positive blood culture

Continue antibiotics beyond 5 days if

- The baby is not fully recovered at 5 days

or

- This is advisable based on the blood culture result and expert microbiological advice if necessary

Meningitis

- If meningitis is suspected but gram stain is uninformative use an antibiotic regimen based on local expert microbiological advice
- Review treatment decisions taking into account subsequent CSF results
- If CSF Gram stain suggest Group B Streptococcus give benzyl penicillin 50mg/kg 12 hourly and gentamicin 4.5 mg/kg every 36 hours
- If culture confirms GBS continue benzylpenicillin for at least 14 days and gentamicin for 5 days
- If CSF Gram stain or culture suggests any organism other than GBS. use an antibiotic regimen based on local expert microbiological advice

Therapeutic monitoring of gentamicin

Trough concentrations

- If second dose is to be given measure trough level before 2nd dose
- Consider the trough level before giving the 3rd dose
- Consider monitoring trough concentrations before every 3rd dose, or more frequently if necessary (e.g. concern about previous level or renal impairment)
- Adjust doses interval aiming to achieve a trough level of < 2mg/l
- If course lasts > 3 doses a trough level of < 1mg/l is advisable
- If a trough level is not available do not withhold the next dose of gentamicin

Peak concentrations

- Consider measuring peak levels in selected babies e.g.
 - with oedema
 - with macrosomia (birth weight > 4.5kg)
 - who do not respond to treatment
- Measure peak concentration 1 hour after starting gentamicin infusion
- Consider increasing the dose if the peak is < 8mg/l