



Topic Expert Group: Medical care and clinical practice

Management of suspected early-onset neonatal sepsis (EONS)

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Target group

Infants with suspected infection within the first 72 hours after birth and parents

User group

Healthcare professionals, neonatal units, hospitals, and health services

Statement of standard

Newborn infants with suspected early-onset infection receive prompt diagnosis and effective treatment of sepsis while avoiding overuse of antibiotics.

Rationale

The goal is to reduce morbidity and mortality from early-onset sepsis and adverse effects of overuse of antibiotics. Early diagnosis and treatment of early-onset neonatal sepsis (EONS) are critical in preventing severe and life threatening complications and mortality. Diagnosis of EONS is difficult due to the often subtle, nonspecific clinical presentation and low predictive values of biomarkers. (1–4) Uncertainty about the presence of neonatal infection may result in unnecessary and prolonged antibiotic treatment. (5,6) A population-based study in Norway reported a rate of 2.3% of all term infants started on antibiotic therapy due to suspected EONS, whereas the incidence of culture-proven EONS was 0.05%. (7) In other European countries and the United States of America even higher proportions of all term infants are started on antibiotic therapy. (8,9)

Antibiotics may have several effects: life-saving for the individual with a severe infection; beneficial for the community hindering spreads of bacteria; problematic for the community regarding development of resistance and for the individual via collateral damage of the microbiome. (10) In early life, antibiotic mediated alteration of the microbiome may have potential consequences for future health. (11–13) In addition, prolonged duration of antibiotic exposure in preterm infants is associated with higher mortality and morbidity, such as chronic lung disease, retinopathy of prematurity, periventricular leucomalacia, and necrotising enterocolitis. (14) Therefore, reduction of unnecessary or prolonged antibiotic therapy is one of the key steps of antimicrobial stewardship to improve future health of the individual and to impede the emergence of multidrug resistant bacteria. (11–16)

Benefits

Short-term benefits

- Reduced mortality (17–20) and morbidity (21,22)
- Reduced unnecessary and prolonged antibiotic therapy for suspected infection (7–9)

Long-term benefits

- Reduced development of multidrug resistance (MDR) (15)



- Reduced alteration of the infant microbiome, with implication for later health (10–13)

Components of the standard

Component	Grading of evidence	Indicator of meeting the standard
For parents and family		
1. Parents (at the hospital and at home) are informed by healthcare professionals about signs, treatment and consequences of early-onset neonatal infection. (17,23–26) (see TEG “Infant- & family-centred developmental care”)	A (Low quality) B (High quality)	Patient information sheet
For healthcare professionals		
2. A unit guideline on management of newborn infants with suspected early-onset neonatal sepsis (EONS) is adhered to by all healthcare professionals.	B (High quality)	Guideline
3. Training on management of newborn infants with suspected EONS is attended by all healthcare professionals.	B (High quality)	Training documentation
4. In infants with only one risk factor for EONS, vital signs are observed and monitored for 12-24 hours (17,23–26), and do not receive antibiotics unless symptomatic. (17,24,25)	A (Moderate quality)	Guideline
5. Always consider to start parenteral antibiotic therapy if newborn infants have two or more risk factors or clinical signs possibly related to sepsis. (17,23–26)	A (Moderate quality)	Guideline
6. Blood cultures are drawn before start of antibiotic therapy. (17,23–26)	A (Moderate quality)	Guideline
7. The need for antibiotic therapy is re-evaluated after 36-48 hours. (17,23–26)	A (Moderate quality)	Guideline



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| 8. Antibiotic therapy is streamlined as soon as blood culture results are available. (17,23–26) | A (Moderate quality) | Guideline |
| 9. $\geq 3^{\text{rd}}$ generation cephalosporins or carbapenems are not routinely used for empiric therapy. (17,23–26) | A (Moderate quality) | Guideline |

For neonatal unit

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| 10. A unit guideline on management of newborn infants with suspected EONS is available and regularly updated in conjunction with obstetric guidance on intrapartum prophylaxis. (17,27) | A (Moderate quality)
B (High quality) | Guideline |
| 11. A unit-based antibiotic stewardship programme is established: minimum for use of $\geq 3^{\text{rd}}$ generation cephalosporins or carbapenems. (28–30) | A (Moderate quality) | Audit report |

For hospital

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|---|----------------------|------------------------|
| 12. Training on management of newborn infants with suspected EONS is ensured. | B (High quality) | Training documentation |
| 13. Analysis of blood cultures including determination of antibiotic resistance patterns with daily report of results is conducted. (15,16,31,32) | A (High quality) | Audit report |
| 14. Hospital-based antibiotic stewardship programme is established: minimum recording of multidrug resistance (MDR). (28–30) | A (Moderate quality) | Audit report |

For health service

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| 15. A national guideline on management of newborn infants with suspected EONS is available and regularly updated in conjunction with obstetric guidance on intrapartum prophylaxis. (27,31–33) | A (Moderate quality) | Guideline |
| 16. Regional/national surveillance and reports of antibiotic resistance patterns of positive blood cultures are available. (15,16,31,32) | A (Moderate quality) | Audit report |



Where to go – further development of care

Further development	Grading of evidence
For parents and family N/A	
For healthcare professionals N/A	
For neonatal unit	
<ul style="list-style-type: none">Develop an algorithm with biomarker guidance for duration of antibiotic therapy. (34–36)	A (Moderate quality)
For hospital	
<ul style="list-style-type: none">Consolidate an antibiotic stewardship programme. (28–30)	A (Moderate quality)
For health service N/A	

Getting started

Initial steps

For parents and family

- Parents are verbally informed by healthcare professionals about signs, treatment and consequences of early-onset neonatal infection.

For healthcare professionals

- Attend training on management of newborn infants with suspected early-onset neonatal sepsis (EONS).
- Reduce the use of unnecessary antibiotic therapy.

For neonatal unit

- Develop and implement a unit guideline on management of newborn infants with suspected EONS in conjunction with obstetric guidance on intrapartum prophylaxis.
- Develop information material on signs, treatment and consequences of early-onset neonatal infection for parents.
- Use published guidelines regarding management of newborn infants with suspected EONS.

For hospital

- Support healthcare professional to participate in training on management of newborn infants with suspected EONS.
- Ensure facilities for rapid detection of bloodstream infection.
- Start with an antibiotic stewardship programme.

For health service

- Use published guidelines regarding management of newborn infants with suspected EONS.
- Develop and implement a national guideline on management of newborn infants with suspected EONS in conjunction with obstetric guidance on intrapartum prophylaxis.



Description

Different national guidelines for the management of suspected EONS are published in Europe and may serve as examples: Guidelines from the United Kingdom (NICE) (17), from Belgium (24), and Switzerland (26). These guidelines are not uniform and differ in some points. (27) The diversity of the guidelines reflects the diversity of their national healthcare system. It is also a consequence of a different translation of available data to clinical practice such as the approach of maternal risk factors for EONS. Guidelines for the management of EONS have to be adapted to the specific healthcare practices such as screening for maternal colonisation with Group B streptococci, and possibilities for observation of newborns at increased risk for EONS.

Source

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Lifecycle

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