

PNEUMONIA IN NEWBORN

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Annotation: The article deals with infectious lesions of the lungs in newborns. The disease can develop within a few hours after birth as part of the generalized sepsis syndrome or 7 days later as an independent disease. Symptoms may be limited to respiratory failure or progress to shock and death. The diagnosis is based on the detection of sepsis, as well as clinical and laboratory data. Treatment consists of first prescribing broad-spectrum antibiotics, followed by their replacement after determining antibiotic resistance.

Key words: pneumonia, newborns, symptoms, diagnosis, etiology, treatment.

Introduction

Pneumonia in newborns is an acute infectious and inflammatory lesion of the respiratory sections of the lungs. Main causes: TORCH-complex pathogens, streptococci and staphylococci, chlamydia, other pathogens that colonize the mother's birth canal. The disease is manifested by a syndrome of respiratory disorders, infectious toxicosis, neurological disorders. For the diagnosis of neonatal pneumonia, radiography of the chest, sputum culture, serological and general clinical blood tests are performed. Treatment includes etiotropic antibiotic therapy, oxygen support, pathogenetic drugs (immunomodulators, infusion solutions).

Pneumonia is the most common invasive bacterial infection after primary sepsis. Early onset pneumonia is part of generalized sepsis, and the first manifestations occur at birth or within a few hours after (Neonatal sepsis). Late-onset pneumonia usually develops after age 7 days, most commonly in neonatal intensive care units among children who require prolonged tracheal intubation due to lung disease (called ventilator-associated pneumonia).

Etiology of neonatal pneumonia

Contact with pathogens occurs transplacentally or as a result of nosocomial infection. These organisms include Gram-positive cocci (eg, group A and B streptococci, methicillin-sensitive and methicillin-resistant strains of *Staphylococcus aureus*) and gram-negative bacilli (eg, *Escherichia coli*, *Klebsiella* spp., *Proteus* spp.). Many other pathogens may be found in children treated with broad-spectrum antibiotics, including *Pseudomonas*, *Citrobacter*, *Bacillus*, and *Serratia*. Some cases of pneumonia are caused by a viral or fungal infection.

Symptoms and signs of neonatal pneumonia

With late onset, nosocomial pneumonia manifests as an unexplained worsening of the patient's respiratory status and an increase in the amount and quality of respiratory secretions (eg, thick and brown). Infants may develop an acute illness with unstable temperature and neutropenia.

Diagnosis of neonatal pneumonia

- Chest x-ray

Evaluation includes chest X-ray, pulse oximetry, blood culture and Gram stain, and culture of tracheal aspirate.

New persistent infiltrates should be visualized on chest x-ray, but they can be difficult to recognize if the child has severe bronchopulmonary dysplasia.

If the Gram stain of the tracheal aspirate shows a significant number of polymorphonuclear leukocytes and a single pathogen that matches that of a culture of the tracheal aspirate, the pathogen is likely to be the cause of the pneumonia. Because bacterial pneumonia in neonates can be disseminated, a full assessment for sepsis, including LP, should be made. However, blood cultures are positive in only 2–5% of cases of nosocomial pneumonia.

Treatment of neonatal pneumonia

- Commonly used vancomycin and broad-spectrum beta-lactam antibiotics

Antimicrobial therapy for early-onset pneumonia is the same as for neonatal sepsis. Vancomycin (see table Dosing of Vancomycin in Neonates) and a broad-spectrum beta-lactam drug such as meropenem, piperacillin/tazobactam, or cefepime (Recommended Neonatal Doses of Some Parenteral Antibiotics) are the initial treatment of choice for most cases of late-onset hospital-acquired pneumonia. This regimen is effective in the treatment of sepsis as well as pneumonia caused by typical nosocomial pathogens, including *P. aeruginosa*. Empirical selection of antimicrobials should always take into account endemic infections and bacterial resistance. More specific antibiotics are prescribed after antibiotic susceptibility results are obtained. The general treatment is the same as for neonatal sepsis.

Chlamydial pneumonia

Exposure to chlamydia during childbirth can lead to the development of chlamydial pneumonia after 2 to 18 weeks. Infants develop tachypnea, but usually not to a critical stage, and there may be a history of conjunctivitis caused by this pathogen. Eosinophilia may be present, and x-ray shows bilateral interstitial infiltrates with hyperinflation.

Treatment of chlamydial pneumonia

- Erythromycin or azithromycin

Pneumonia is usually treated with erythromycin 12.5 mg/kg orally every 6 hours for 14 days or azithromycin 20 mg/kg orally IV once a day for 3 days. Occasionally, however, a second course may be needed (see Recommended Doses of Some Oral Antibiotics for Neonates). Because erythromycins can cause hypertrophic pyloric stenosis (HPS) in newborns, all newborns treated with erythromycin or azithromycin should be screened for symptoms and signs of HPS, and their parents should be counseled about the potential risks.

The diagnosis of *Chlamydia trachomatis* pneumonia should prompt examination of the mother and her partner because untreated maternal chlamydial infection can lead to complications such as pelvic inflammatory disease and infertility.

Conclusion

For the diagnosis of neonatal pneumonia, radiography of the chest, sputum culture, serological and general clinical blood tests are performed. Treatment includes etiologic antibiotic therapy, oxygen support, pathogenetic drugs (immunomodulators, infusion solutions).

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