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STANDART TREATMENT AND MODERN APPROACHES TO COMMUNITY-ACQUIRED PNEUMONIA IN INFANTS

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Abstract

Community-acquired pneumonia (CAP) in infants remains one of the leading causes of morbidity and hospitalization in pediatric practice. The immaturity of the immune system, anatomical and physiological characteristics of the respiratory tract, and high susceptibility to infections contribute to the severe course of the disease in this age group. Modern approaches to CAP management are based on early diagnosis, rational antibiotic therapy, supportive care, and preventive strategies. This article reviews standard treatment protocols and current clinical recommendations for the management of community-acquired pneumonia in infants.

Keywords

community-acquired pneumonia, infants, antibiotic therapy, respiratory support, clinical guidelines, pediatrics.

Introduction

Community-acquired pneumonia is an acute infectious and inflammatory disease of the lung parenchyma that develops outside the hospital setting or within the first 48 hours after admission. In infants, CAP is associated with a high risk of complications and requires timely and appropriate treatment.

The most common pathogens include bacterial agents (Streptococcus pneumoniae, Haemophilus influenzae), respiratory viruses (RSV, influenza virus, parainfluenza virus), and mixed infections. In neonates and young infants, intracellular and atypical pathogens may also play a significant role.

Etiology and Pathogenesis

In infants, bacterial and viral-bacterial infections predominate. The infection usually spreads to the lower respiratory tract via the bronchogenic route, leading to inflammatory infiltration of the alveoli, impaired ventilation-perfusion relationships, and development of respiratory failure.

Pathophysiological features in infants include:

- Narrow airways;
- Tendency toward rapid mucosal edema;
- Insufficient surfactant production;
- Immature immune response.

Clinical Presentation

Symptoms in infants may be nonspecific. The most common clinical manifestations include:

- Fever or hypothermia;
- Tachypnea;
- Chest wall retractions;
- Cyanosis;
- Feeding refusal;
- Lethargy or irritability.

On physical examination, decreased breath sounds, crackles, or localized rales may be detected. Tachypnea at rest is considered a key diagnostic criterion.

Standard Treatment of Community-Acquired Pneumonia

Management depends on disease severity and the infant's age.

1. Antibiotic Therapy

Antibiotics remain the cornerstone of treatment for bacterial CAP.

- Mild cases: oral amoxicillin.
- Moderate to severe cases: parenteral β-lactam antibiotics (ampicillin, amoxicillin/clavulanate, third-generation cephalosporins).
- Suspected atypical infection: macrolides.

The typical duration of therapy is 7–10 days; in complicated cases, treatment may extend to 14 days or longer.

2. Supportive Therapy

- Oxygen therapy when oxygen saturation is <92%;
- Adequate hydration;
- Antipyretics for high fever;
- Monitoring of fluid and electrolyte balance.

Mucolytics and antitussive medications are generally limited in infants due to safety concerns.

Modern Approaches to Management

Contemporary clinical guidelines emphasize:

1. Rational Antibiotic Use

- Selection of antibiotics based on local resistance patterns;
- Avoidance of unnecessary antibiotic use in viral infections;
- De-escalation strategies following microbiological results.

2. Early Severity Assessment

Use of clinical severity scores and continuous oxygen saturation monitoring helps determine the need for hospitalization and intensive care.

3. Respiratory Support

In severe cases, advanced respiratory support may be required:

- High-flow oxygen therapy;
- Non-invasive ventilation;
- Invasive mechanical ventilation when indicated.

4. Prevention

- Pneumococcal vaccination;
- Influenza vaccination;
- RSV prophylaxis in high-risk groups.

Complications

Delayed or inadequate treatment may lead to:

- Pleural effusion;
- Lung abscess;
- Sepsis;
- Respiratory failure.

Early diagnosis and appropriate therapy significantly reduce the risk of adverse outcomes.

Conclusion

Community-acquired pneumonia in infants represents a significant clinical challenge. Standard treatment includes timely antibiotic therapy and supportive care. Modern approaches focus on rational antibiotic use, early severity assessment, and effective respiratory support strategies. A comprehensive and evidence-based approach improves clinical outcomes and reduces complication rates in this vulnerable population.

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