

Pneumonia in Children: Symptoms and Treatment

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Abstract: Pneumonia in children is an acute infectious lesion of the lung parenchyma and adjacent functional structures of the respiratory system. Childhood pneumonia is accompanied by general intoxication, coughing fits, and impaired pulmonary gas exchange. Diagnosis is made through examination, auscultation, laboratory tests, and instrumental studies. Treatment for childhood pneumonia includes the use of medications with antibacterial, bronchodilator, antipyretic, mucolytic, and antihistamine effects.

Keywords: pneumonia, pneumonia, respiratory system, infection, viruses, bacteria, cough, shortness of breath, fever, respiratory failure, antibiotics, treatment, prevention, complications, children, adults, immunity.

Introduction: Pneumonia in children is an acute infectious inflammatory process of the lower respiratory tract, accompanied by the formation of a pulmonary infiltrate. The peak incidence of childhood pneumonia occurs during the acute respiratory infection season. Preschool-aged children are at risk; due to their immature and vulnerable immune systems, they have a difficult time coping with pneumonia. At the first sign of pneumonia, a child should be seen by a doctor as soon as possible. A pulmonologist determines the diagnostic methods and treatment plan; in some cases, a consultation with an infectious disease specialist is recommended.

The etiological factors of the infectious process include the activity of various pathogens: bacteria, viruses, fungi, and protozoa. Childhood pneumonia is a life-threatening condition and carries the risk of developing severe complications, possibly even death.

Main Part: The proportion of viral pneumonias is small; in 80% of cases, the pathogen is a bacterium. The routes of infection correlate with the child's age and environmental factors. Newborns suffer from pneumonia of intrauterine etiology and are susceptible to hospital-acquired infections. The triggers of congenital pneumonia in children include herpes simplex virus types 1 and 2, the causative agent of chickenpox, cytomegalovirus, and chlamydia. Nosocomial infections occur with streptococci and staphylococci, *Escherichia coli*, and *Klebsiella*. Childhood pneumonia often occurs as a complication of acute respiratory viral infections (including influenza), croup, measles, and other illnesses. In children, pneumonia is transmitted through the air, via airborne droplets.

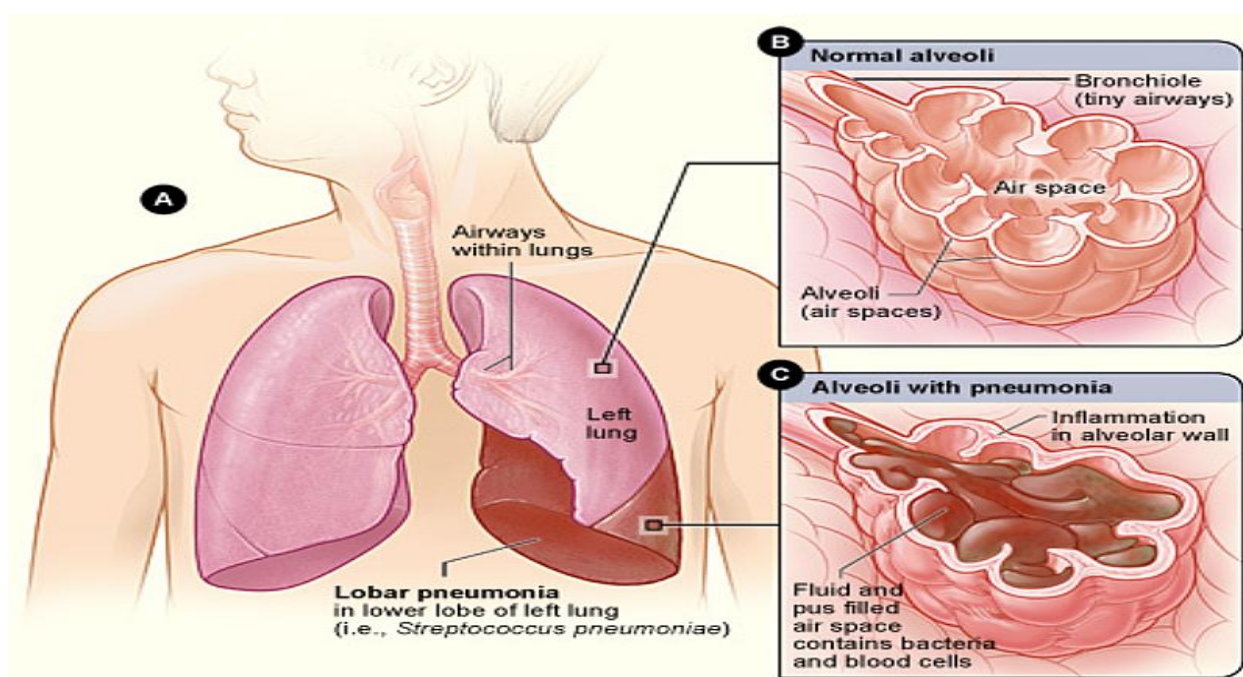
In young children, pneumonia is caused by pathogenic microflora in the upper intestine (*Escherichia coli*, *Enterobacter*). Schoolchildren often experience atypical pneumonia, which develops as a result of mycoplasma and chlamydia. Coughing causes infected secretions to be expelled into the bronchi, where the infection affects the bronchioles. Pulmonary microcirculation is impaired, areas of infiltration form in the lung tissue, gas exchange is impaired, and respiratory acidosis and respiratory failure develop.

Risk factors for childhood pneumonia:

- Prematurity
- Weak immune system
- Low body weight
- Stressful environment
- Hypothermia
- Chronic foci of infection in the oropharynx
- Chronic pathologies outside the lungs.

In infants, pneumonia can be caused by aspiration due to regurgitation after feeding, gastroesophageal reflux, or vomiting.

Analysis and results: Nosocomial infection is associated with medical procedures performed on the child. Tracheal aspiration, bronchial lavage, inhalation, bronchoscopy and mechanical ventilation are associated with the risk of spreading pathogenic microflora from the upper respiratory tract to the lower respiratory tract.



Picture.1 Illustration courtesy of tabletsmanual.com

In pulmonology practice, the classification of pneumonia takes into account the specific clinical manifestations of a given form of pathology, the circumstances of infection, the morphological features of childhood pneumonia revealed by radiography, the severity, duration, causes, and conditions of onset of pneumonia.

Based on the location of infection, childhood pneumonias are divided into:

- community-acquired (home-acquired);
- hospital-acquired (hospital-acquired);
- congenital (intrauterine).

Home-acquired pneumonia manifests as a complicated course of acute respiratory viral infection. Hospital-acquired pneumonia occurs within three days of a child's hospitalization and in the first few days after returning home. Hospital-acquired childhood pneumonias are more severe than other types of pneumonia and are fraught with complications. This is because hospital-acquired flora becomes resistant to antibiotic therapy. Congenital pneumonias are those whose symptoms appear within the first three days of a child's life, as well as pneumonias of the neonatal period.

Based on etiology, childhood pneumonia can be caused by viral, bacterial, fungal, parasitic, mycoplasmal, chlamydial, or mixed pathogens.

Childhood pneumonia can be uncomplicated or complicated. The complicated form is fraught with worsening respiratory failure, pulmonary edema, purulent-inflammatory processes in the pleura and lung tissue, extrapulmonary foci of sepsis, and cardiovascular disorders.

Pneumonia in children occurs in acute and prolonged forms. The resolution time for acute pneumonia ranges from four to six weeks. Pneumonia is considered protracted if symptoms of pneumonia persist for more than six weeks.

Based on radiographic features, childhood pneumonia is classified as focal (focal-confluent), lobar, segmental, and interstitial. Symptoms of pneumonia in children. The clinical picture of childhood focal pneumonia appears by the end of the first week of acute respiratory viral infection. The initial stage of the disease is characterized by symptoms of generalized poisoning by exogenous toxins, including fever, weakness, insomnia, pale skin, loss of interest in food, and, in infants, belching and vomiting.

The respiratory syndrome in childhood pneumonia is characterized by a wet or dry cough and shortness of breath; shallow ventilation results in respiratory acidosis. The focal form of the disease is characterized by a severe course of the disease with signs of respiratory dysfunction and exogenous poisoning by toxins. Focal confluent pneumonia is accompanied by the risk of pleural effusion or bacterial lung destruction (BLD).

Signs of segmental pneumonia in a child include fever, intoxication, and respiratory failure. Regenerative processes in the affected tissues take several months. In the final phase of the inflammatory process, collapsed areas of the lungs can be replaced by scar tissue and bronchiectasis.

The clinical picture of the lobar form of the disease begins with a striking symptom complex: severe hyperthermia and chills, painful breathing and coughing, abnormally colored sputum, and obvious failure of the lungs' gas exchange function. Childhood pneumonia is often accompanied by abdominal pain, bouts of vomiting, and acute abdomen.

With interstitial pneumonia, along with the typical symptom complex of childhood pneumonia, specific signs are present: weakened and shallow breathing, right ventricular heart failure.

Diagnosis: Clinical diagnosis of childhood pneumonia is based on general symptoms, auscultatory abnormalities in the lungs, and radiographic findings. Chest radiography can detect foci of infiltration or interstitial tissue. Diagnosis of the etiologic factor of the pathology involves examining the bacterial flora of discharge from the nasopharynx and bronchi, as well as virological analysis.

Blood tests reflect the nature of the infectious process: elevated white blood cells, neutrophils, and ESR. In severe pneumonia, a comprehensive biochemical analysis of blood components is prescribed. Pulmonary gas exchange is monitored using pulse oximetry. It is important to promptly differentiate childhood pneumonia from acute respiratory infections, bronchitis, tuberculosis, and cystic fibrosis. A pediatrician can make a diagnosis of typical childhood pneumonia. If the diagnosis is in doubt, the child should be examined by a pediatric pulmonologist or tuberculosis specialist. A CT scan of the lungs, a fiberoptic bronchoscopy, and a number of other tests are recommended.

Treatment of pneumonia in children: Reasons for hospitalization of a child with suspected pneumonia are:

- Age under three years;
- Involvement of multiple lung lobes;
- Severe respiratory failure;

- Pleural infection;
- Severe encephalopathy;
- Weight loss;
- Congenital heart and vascular defects;
- Chronic lung and kidney pathologies;
- Immunodeficiency states.

During fever, the child is prescribed rest and bed rest, a balanced diet, and plenty of fluids.

The current approach to treating childhood pneumonia is a combination of empirical and, subsequently, etiotropic antibacterial therapy. If the chosen antibiotic does not produce the expected results within two days, the initial drug of choice is replaced with another antibiotic. When conducting complex therapy for childhood pneumonia, medications from the following groups are prescribed: antipyretics, mucolytics, bronchodilators, and antiallergic drugs.

To accelerate the regeneration process after the acute stage of pneumonia has resolved, physiotherapy, massage, and exercise therapy are recommended.

Conclusion

1. Thus, pneumonia in children remains one of the most common and potentially dangerous respiratory diseases. Timely diagnosis, adequate treatment, and preventive measures can significantly reduce complications and mortality.
2. In summary, early detection of pneumonia and appropriate treatment are crucial for maintaining a child's health. A comprehensive approach, including drug therapy, care, and immune support, ensures a favorable outcome.
3. Thus, pneumonia in children requires close attention from healthcare professionals and parents. Regular preventive examinations, vaccinations, and improved sanitary and hygienic conditions can reduce the prevalence of the disease.
4. Pneumonia in childhood is a serious public health problem that requires a comprehensive solution. Only collaboration between the physician, family, and society as a whole ensures effective prevention and treatment of this pathology.
5. In conclusion, it should be emphasized that pneumonia in children is a disease that, with proper and timely treatment, has a favorable prognosis. Particular attention should be paid to prevention, promoting a healthy lifestyle, and strengthening the child's immune system.

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