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PNEUMONIA IN YOUNG CHILDREN

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Pneumonia in children, despite significant advances in prevention and treatment, still remains one of the most pressing problems in pediatrics. [3,5,16,19,21]. In recent years, there has been an increase in morbidity in children, and mortality from this disease remains relatively high. In real practice, especially in outpatient settings, early diagnosis and rational therapy of pneumonia in children are serious problems.

Pneumonia is an acute infectious disease of different etiologies, characterized by focal lesions of the lungs with intraalveolar exudation, which manifests itself in various degrees of intoxication, respiratory disorders, local physical changes in the lungs and the presence of an infiltrative shadow on the chest x-ray. The incidence of pneumonia is 15-20 per 1000 children in the first year of life. It is necessary to distinguish between "typical" forms of the disease with a clear focus or infiltrate on the radiograph and "atypical" - with inhomogeneous changes that do not have clear boundaries.

The severity of pneumonia is determined by pulmonary heart failure, toxicosis and the presence of complications (pleurisy, pulmonary destruction, infectious toxic shock).

In accordance with the International Classification of Diseases, Injuries and Causes of Death of the 10th revision (ICD-10) and the "Classification of Clinical Forms of Bronchopulmonary Diseases in Children" [7], the following forms of pneumonia are distinguished:

1. By etiology:
• Bacterial (including those caused by atypical bacteria);
• Viral;
• Fungal;
• Parasitic;
• mixed.
2. By morphology:
• Focal - one or more foci of pneumonic infiltration 1-2 cm in size;
• Focal-confluent (pseudo-lobar infiltrate) - heterogeneous massive pneumonic infiltration, consisting of several foci. May be complicated by destructive processes and exudative pleurisy;
• Segmental - the boundaries repeat the anatomical boundaries of one segment;
• polysegmental - the boundaries of infiltration repeat the anatomical boundaries of several segments. Often occurs with a decrease in the size of the affected area of the lung (atelectatic component);
• Lobar (lobar) - infiltration covers the lobe of the lung. A variant of the course of lobar pneumonia is croupous pneumonia;
• Interstitial - along with inhomogeneous infiltrates of the lung parenchyma, there are pronounced, sometimes predominant changes in the interstitium of the lungs. A rare form of pneumonia that develops in patients with IDS.
3. Downstream:
• Acute - duration up to 6 weeks;
• Protracted - duration of more than 6 weeks.
4. By severity:
• Moderate;
• Heavy.
5. According to the developed complications:
• Pleural complications - pleurisy;
• Pulmonary complications - cavity formations, abscess;
• Pulmonary-pleural complications - pneumothorax, pyopneumothorax;
• Infectious-toxic complications - bacterial shock.

According to the conditions of infection, pneumonia is divided into community-acquired (home) and nosocomial (hospital, nosocomial), in newborns - into intrauterine (congenital), intranatal and postnatal (acquired), the latter can also be community-acquired and nosocomial [2,3,6]. Community-acquired pneumonia in children aged 1 to 6 months of life can be divided into two groups depending on the clinical manifestations. These are typical - focal (focal, confluent), developing against the background of high

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fever, and atypical - with predominantly diffuse changes in the lungs, occurring at low or normal body temperature [1,2,20,23].

In children aged 6 months - 6 years, the most common (more than 50%) causative agent of pneumonia is pneumococcus, it causes 90% of complicated pneumonia. H. influenzae type b causes up to 10% of complicated forms. Staphylococcus is rarely detected. Acapsular H. influenzae is found in lung punctures quite often, usually in combination with pneumococcus [3], but their role is not completely clear. Atypical pneumonia caused by M. pneumoniae is observed in this age group in no more than 10-15% of patients, Chl. pneumoniae is even rarer [4,6,15,22].

According to the nature of the clinical and radiological picture, focal, focal-confluent, segmental, lobar (croupous) and interstitial pneumonia are distinguished. According to the severity of the course, extremely severe, severe, moderate and mild pneumonia are distinguished. The severity of the clinical course is determined by the presence and severity of pulmonary heart failure and toxicosis, as well as the presence of complications. In turn, complications are divided into pulmonary - pleurisy, pulmonary destruction (abscess, bullae, pneumothorax, pyopneumothorax) and extrapulmonary - septic shock, otitis, meningitis.

Intrauterine pneumonia is more often caused by Streptococcus pneumoniae, which is the cause of invasive and non-invasive forms of pneumonia, and gram-negative bacteria - Escherichia coli, Klebsiella pneumoniae, less often - Staphylococcus aureus, Listeria monocytogenes. Associations with cytomegalovirus, herpes simplex virus, and fungi of the genus Candida are possible [8]. At the age of 7-15 years, the main bacterial causative agent of typical pneumonia is pneumococcus (35-40%), rarely - pyogenic streptococcus, the proportion of atypical pneumonias exceeds 50% - they are caused by M. pneumoniae (20-60%) and Chl. pneumoniae (6–24%) [1,2,3,4,6,18]. The main causative agent of atypical pneumonia is Chlamydia trachomatis. The first manifestation of chlamydial infection is conjunctivitis in the first month of a child's life, and the symptoms of pneumonia appear after 6-8 weeks of life.

In the etiology of nosocomial pneumonia, both the hospital microflora, usually resistant to antibiotics, and the patient's auto-microflora play a role. Among pathogens are more common than others E. coli, K. pneumoniae, Proteus spp., Enterobacter spp., Pseudomonas aeruqinosa, less often S. aureus. Often, infection occurs when performing therapeutic and diagnostic manipulations (sputum suction, catheterization, bronchoscopy, thoracocentesis). The nature of the microflora depends on the profile of the hospital and the anti-epidemic regime.

Focal pneumonias (bronchopneumonias) are more common in young children and currently account for 30-40% of the total number of pneumonias [9,10,24].

In the vast majority of cases, focal pneumonia develops acutely against the background of an acute respiratory infection already in the first days or 4-7 days from its onset. A viral infection disrupts the protective mechanism of the lung, suppresses phagocytosis, changes the bacterial flora, affects the functioning of the ciliated epithelium and contributes to the occurrence of inflammatory foci. The severity of pneumonia that developed against the background of an acute viral infection is determined by the nature of the viral infection, the bacterial flora, and the characteristics of the individual reactivity of the child.

For focal pneumonia, a deep, wet cough is characteristic (a sign of bronchial damage). Intoxication is often moderate. Body temperature rises to 38 ° C, lethargy or anxiety, pallor of the skin, moderate cyanosis of the nasolabial triangle, increased respiration with retraction of the intercostal spaces and tension of the wings of the nose are noted. Percussion of the chest reveals the presence of a lung sound, sometimes with a tympanic tinge or with a slight shortening. An important diagnostic sign of focal pneumonia is a characteristic clinical picture in the lungs: persistent local fine bubbling rales or crepitus, mainly on one side. With concomitant bronchitis, widespread dry and moist rales of various sizes are heard.

For the diagnosis of pneumonia, chest X-ray is of great help - a reliable method for timely confirmation of the diagnosis of pneumonia, which also allows you to determine the extent of the lesion and the presence of complications. In pneumonia, radiographs reveal infiltrative shadows, not always homogeneous, in the form of foci of various sizes. The process is often unilateral, with damage to the lower parts of the right lung. In patients with pneumonia, classical auscultatory and percussion signs are detected, there is a temperature above 38.0 ° C for more than 3 days, shortness of breath in the absence of signs of bronchial obstruction (> 60 / min in children under 2 months, > 50 at the age of 2 - 12 months and > 40 in children 1-5 years old), asymmetry of moist rales.

In the general analysis of blood with focal pneumonia, moderate hypochromic anemia can be detected, almost half of the sick children have leukocytosis. Some patients have leukopenia with a shift

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of the formula to the left. At the same time, often (in 1/3 of patients), the number of leukocytes remains within the normal range, ESR increases, but not in all children. KOS indicators depend on the severity of toxicosis, hypoxia, and the duration of the disease. In the first days from the onset of the disease, CBS is usually characterized by the presence of acidosis, more often respiratory, less often metabolic. Metabolic and respiratory alkalosis develops later in the disease. Disorders of water and electrolyte metabolism are characteristic for children. Their severity depends largely on the period of the disease, the presence of complications and dyspeptic disorders. Hypokalemia is clinically expressed by lethargy, muscle hypotension, hyporeflexia, and severe tachycardia (up to 160-200 beats per minute). The content of sodium in the blood serum remains more stable and is manifested by slight hypo- or hypernatremia with fluctuations from 130 to 145 mmol / l.

Segmental pneumonia develops acutely, sometimes violently. The temperature rises to 39-40°C. There is a pronounced toxicosis, sometimes with signs of exicosis. Attention is drawn to the features of the skin (pallor with a waxy or grayish tinge, marble pattern), dry, painful, less often wet cough, grunting or groaning breathing. Bloating in the anterior chest, lagging behind in the act of breathing of the affected lung can be determined. An important diagnostic sign of segmental pneumonia is a characteristic percussion picture: a shortening of the sound over the lungs, turning into dullness, respectively, the projection of the segments of the lung affected by the inflammatory process.

Lung auscultation is less informative for diagnosis: weakened breathing is heard over the affected areas of the lung, sometimes with a bronchial or amphoric tinge. Moist rales are not characteristic of this form of pneumonia. They may be heard in small numbers, very briefly, or not heard at all. Changes in hemograms, blood biochemical composition, disturbances in water and electrolyte metabolism, CBS in children with polysegmental pneumonia, as well as in patients with focal pneumonia, depend on the duration of the disease, the presence of complications, but are generally more pronounced. X-ray examination reveals intense, sometimes uneven darkening in the area of one, two or more segments of the lung or the entire lobe. The inflammatory infiltrative process is more often localized in the upper lobe of the right lung (segments I, II), in the lower lobes of the right and left lungs (segments VIII, IX, X), in the reed segments. The process is usually one-sided. Often the segment is in a state of atelectasis.

Croupous pneumonia is caused by pneumococci: the inflammatory process spreads to large areas of the parenchyma and is characterized by a cyclic course with high fever and crisis-type resolution. Radiographically distinguishing the shadow of lobar pneumonia from segmental pneumonia can be difficult, so this diagnosis is based on clinical data. In recent years, lobar pneumonia has been diagnosed rarely (1-3% of the total number of pneumonias), mainly in cases of outpatient treatment without antibacterial drugs due to late diagnosis. The rarity of lobar pneumonia in the first year of life is explained by the lack of sensitization in children of this age to pneumococci.

Interstitial pneumonias are rare and account for less than 1% of all pneumonias [15,17]. R. Lenk [11] singled out their characteristic radiological features in 1946: 1. Change in lung pattern; fusiformly emanating from an expanded root, consisting of rough or gently delineated stripes, which are based on peribronchial infiltration, possibly bronchial filling with exudate. 2. Mesh lung pattern in the affected area with different cellularity. Against the background of these two types of changes, with the development of foci of atelectasis, small spotting appears. 3. Widespread taut, well-defined shadows with signs of bronchial constriction (areas of atelectasis).

In young children, interstitial pneumonia begins acutely or against the background of catarrh of the upper respiratory tract: the disease is severe, with symptoms neurotoxicosis and respiratory failure (sharp shortness of breath with a respiratory rate of up to 80-100 per minute, cyanosis of the nasolabial triangle, pallor of the skin, with anxiety - generalized cyanosis, tension of the wings of the nose, retraction of the intercostal spaces), fever, later with the addition of frequent obsessive, agonizing whooping cough. During percussion, tympanitis is noted, during auscultation - hard breathing, in some patients, unstable scattered dry, less often wet rales of various sizes. The classic example of interstitial pneumonia is pneumocystis pneumonia.

Staphylococcal pneumonia is characterized by an acute onset, high body temperature, rapidly increasing tachypnea, dyspnea, cyanosis, lethargy or agitation, flatulence, anorexia, vomiting, regurgitation, diarrhea. Extrapulmonary complications often occur (otitis media, pyelonephritis, etc.). Massive infiltrative shadows within one or more segments of a lobe or several lobes. The presence of air cavities (bull), abscesses, pleurisy, pneumothorax.

Streptococcal pneumonia proceeds rapidly, characterized by severe intoxication, chills. There are no physical data (no clear percussion changes, few

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wheezing). Pronounced interstitial changes with multiple rounded foci in different stages of resorption.

With pseudomonas pneumonia, intoxication and respiratory failure are expressed against the background of normal body temperature. Sputum is mucopurulent or purulent, greenish in color. As a rule, children who received antibiotics in a hospital are ill. Bilateral confluent focal shadows of low intensity, different sizes, without clear boundaries, against the background of excessive vascular-interstitial pattern. Rapid progress with the development of pneumothorax.

Mycoplasmal pneumonia is accompanied by catarrhal phenomena of the upper respiratory tract. The disease has a protracted, undulating course. The onset is gradual, an obsessive pertussis-like non-productive cough is characteristic, physical data in the lungs are scarce.

Pneumocystis pneumonia is often observed in children with impaired cellular immunity (mainly children who were in the neonatal unit, in intensive care units, children from closed groups who are re-admitted to the department of respiratory infections).

Influenza pneumonia is more common during influenza epidemics. Begins acutely, without prodromal phenomena. Symptoms of intoxication, an increase in body temperature up to 39-40 ° C are characteristic, convulsions, vomiting, upset of the gastrointestinal tract, damage to the cardiovascular system (deafness of tones, tachycardia, arrhythmia), meningeal signs are often noted. Catarrhal phenomena are scanty. Influenza pneumonia often occurs as interstitial with emphysema or as small-focal.

Indications for hospitalization of children with pneumonia are: the severity of the condition: cyanosis, shortness of breath, increased respiration, groaning, oxygen saturation (SaO2) less than 92%, lowering blood pressure (BP), pulmonary-pleural complications, severe dehydration, refusal to eat; the presence of severe concomitant diseases, immunocompromised conditions; the age of the child is up to 6 months; lack of response in patients with pulmonary infiltrate to starting ABT within 48 hours; unsatisfactory social and living conditions. Risk factors for death with CAP in children, there are late visits to the doctor and hospitalization, low socioeconomic status of the family, early age of the child, and severe comorbidities. Treatment of pneumonia in children is carried out taking into account the etiological factor, clinical form and characteristics of the course of the disease. The basic principles of the treatment of pneumonia are reduced to taking measures aimed at combating oxygen deficiency, infectious onset and toxicosis, restoring the impaired functions of various systems and organs, preventing possible complications, increasing resistance and improving the reactivity of the body.

With pneumonia, bed rest is recommended only for the febrile period of the disease. In the acute period, children practically do not eat; restoration of appetite is the first sign of improvement in severe processes with prolonged fever. The rapid reverse dynamics of clinical symptoms allows you to transfer the child to the general mode. Be sure to ventilate the premises. Patients with intoxication and severe pneumonia may require intravenous infusion of urine-controlled fluids, serum electrolytes, and hematocrit.

Mucolytics and expectorants are indicated when the patient develops an intense, unproductive cough. The choice of an antibacterial drug is carried out empirically, taking into account different pathogens and the severity of the process. Indications for the replacement of the drug is the absence of a clinical effect within 36-48 hours for non-severe and 72 hours for severe pneumonia. In complicated pneumonia, treatment begins with parenteral drugs, replacing them with oral ones when the effect occurs (stepwise method). For mild pneumonia, both in the hospital and on an outpatient basis, preference is given to oral drugs: amoxicillin, amoxicillin clavulanate (augmentin), cefuroxime axetil (zinnat), acting on both pneumococci and Haemophilus influenzae.

In atypical pneumonia, macrolides and azithromycin are the drugs of choice. Since they also act on the coccal flora, these drugs can be used in people with allergies, but their widespread use is undesirable due to the stimulation of drug resistance of the flora. Evaluation of the effectiveness of treatment is carried out after 24, 36 and 48 hours of treatment. The full effect is recorded when the temperature drops below 38.0 ° C (without antipyretics) and the general condition improves, appetite appears, while the x-ray picture may improve or remain the same. This indicates the sensitivity of the pathogen to the drug, therefore, treatment with this drug should be continued [12,13,14,16]. A partial effect is recorded with an improvement in the general condition and appetite, as well as the absence of negative dynamics in the focus, but while maintaining a febrile temperature, such a picture is observed of a suppurative focus (destruction) or an immunopathological process (metapneumonic pleurisy). At the same time, the antibiotic is not changed, the full effect occurs later - when the abscess is emptied or anti-inflammatory drugs are prescribed. If the patient remains febrile, increases infiltration in the lungs or general disorders, it is considered that there is

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no effect in these cases, an immediate change of antibiotic is required. The duration of treatment for non-severe pneumonia is 5-7 days, for complicated forms 10-14 days (2-3 days after the temperature drops). With nosocomial pneumonia, the replacement of the drug is carried out according to bacteriological data or empirically already after 24-36 hours, at the first signs of inefficiency. Fluoroquinolones are used in children over 12 years of age and in extremely severe cases in younger patients with resistance to enterobacillary, Pseudomonas aeruginosa and atypical flora. In anaerobic processes, metronidazole is used; in fungal etiology processes, fluconazole, ketoconazole.

Treatment of non-severe pneumonia under good conditions is possible at home. With the rapid onset of the effect of antibiotics, other types of therapy are not needed. Antipyretics for pneumonia are not prescribed, as this may make it difficult to assess the effectiveness of treatment. Ventilation is a must. Before the onset of the effect, bed rest, with rapid reverse dynamics, the child is transferred to half-bed rest, and from the 6-10th day to the general regime. Hardening can be resumed after 10-14 days, but heavy physical exertion (sports) is acceptable after 6 weeks, with mild and 12 weeks after complicated pneumonia. During this time, pulmonary blood flow is restored. Decreased in the first days, the appetite is quickly restored, which makes it unnecessary to prescribe vitamins. Physiotherapeutic procedures on the chest (iontophoresis, microwave, etc.), including during the reparation period, are ineffective.

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