Problems of Studying the Pathological Anatomy of Pneumonia in Children Against the Background of Immunodeficiency

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ABSTRACT

Pneumonia as an independent disease and complicating process remains one of the most frequent and threatening infections. In spite of introduction into practice of highly effective antibacterial preparations, pronounced tendency to increase of unfavorable outcomes of pneumonia, especially in children and persons of working age, testifies to qualitative change of the disease in modern conditions[11]. Currently, the species spectrum of infectious complications, acute and nosocomial bacterial pneumonia and sepsis has changed drastically. This has been facilitated by an increased incidence of congenital and acquired immunodeficiency states, due to various endogenous and exogenous factors[3,9,12].

Keywords: pneumonia, immunodeficiency state, childhood, pathological anatomy

Introduction. Respiratory pathologies caused by pneumonia are on the rise, particularly in children in pandemic settings[6]. At certain stages of research, opinion was formed about the solution to this clinical problem [3,8]. However, when experience was gathered, questions were raised about disease classification, course, clinical forms, emerging pathogens, outcomes and treatment programme design. Summarised data on respiratory tract infections suggest that in clinical practice there are over 25% of patients in this category.[5,7] despite impressive advances in pharmacotherapy and the development of new generations of antibacterial agents, the percentage of pneumonia as a part of the disease is very high. Each year, more than 4.5 million people worldwide are examined by doctors for the disease. Among all patients hospitalised with bronchopulmonary inflammation, the number of pneumonia patients is increasing by more than 60%, not counting acute respiratory infections.

According to our data, Klebsiella inclusively caused 63.4% of deaths from infectious diseases, including acute and secondary pneumonia, post-traumatic and post-operative complications, and sepsis. Klebsiella strains were three times more prevalent than pneumococci and more than six times more prevalent than other types of bacteria. In 20% of cases, Klebsiella were isolated with other bacterial pathogens (pneumococci, Haemophilus influenzae bacteria, Pseudomonas aeruginosa) [2].

According to WHO, the mortality rate from pneumonia in 2000 was 0.67% amongst

smallpox and adults, and 0.3% amongst children under 14 years of age. The disease requires long-term biological rehabilitation, mediates the development of recurrent disease, chronicity of the process and disability of children and adolescents [9].

The morphological form of pneumonia is determined by the nature and extent of lung damage, taking into account clinical and radiological data. Focal pneumonias (bronchopneumonias) are more common in young children, and currently account for 30-40% of all pneumonias. Focal flush pneumonia is more severe, accounting for 3-6% of all pneumonias. Segmental pneumonia is more common in children over 1 year of age (66%), but can also occur in the first months of life[2,5]. In recent years, round pneumonia has been diagnosed rarely (1-3% of all pneumonias), mainly in cases of outpatient treatment without antibiotics, due to late diagnosis. Interstitial pneumonia is a rare form and accounts for less than 1% of all pneumonias. [1,4]. The course of the disease is determined by dynamic observation of the patient. Acute pneumonia is defined as pneumonia that resolves within 1.5 months. With adequate therapy, most uncomplicated pneumonia resolves in 2-4 weeks, complicated pneumonia -1-2 months. Lingering course is diagnosed at duration of pneumonic process from 1.5 to 6 months[10].

The aim of this study is to characterize clinical and immunological peculiarities of pneumonia in children and to study pathological and anatomical parameters of inpatients.

Materials and methods of investigation. To solve our task we studied pathological and anatomical changes in children with pneumonia, observing cases of immunodeficiency in 65 children.

Results and discussion. Atypical forms (20% of cases and more), caused by Chlamidiatrachomatis (consequence of perinatal infection), and quite rarely (in premature infants) by Pneumocystiscarinii, were frequently observed at 1-6 months of age. In more than half of patients typical pneumonias are associated with food aspiration, cystic fibrosis, primary immunodeficiency; their causative agents are Gram-negative intestinal flora, staphylococci. Pneumonias caused by pneumococci and Haemophilusinfluenzae type b occur in 10% of children; these are usually caused by contact with an older sibling or adult family member with an acute respiratory infection.

In children 6 months to 6 years of age, pneumococcus is the most common pneumonia agent (more than 50%) and is responsible for 90% of complicated pneumonias. H. influenzae type b causes up to 10% of complications. Staphylococcus aureus is rarely detected. Capsule-free H. influenzae are detected in lung punctures quite often, usually in combination with pneumococcus [3], but their role is not fully understood. Atypical pneumonias caused by M. pneumoniae, are observed in this age group in not more than 10-15% of patients, Chl. pneumoniae - even rarer.

At the age of 7-15 years the main bacterial causative agent of typical pneumonias is pneumococcus (35-40%), rarely pyogenic streptococcus, share of atypical pneumonias exceeds 50% - they are caused by M. pneumoniae (20-60%) and Chl. pneumoniae (6-24%). Pneumonias in immunocompromised patients, including those on immunosuppression, are caused by both common and opportunistic microflora (P. carinii, Candida fungi). Pneumonias caused by P. carinii, cytomegalovirus, M. avium-intercellulare, and fungi are not uncommon in HIV-infected and AIDS patients, as well as in long-term glucocorticosteroid therapy (>2 mg/kg/day or >20 mg/day over 14 days).

Conclusions. In recent years the number of children with congenital and acquired immunodeficiency states, and disorders of local immunity in bronchopulmonary system increases.

The proportion of children with hereditary pathology is increasing. According to Professor Sotnikova, in 80% of young children pneumonia develops against a background of immunodeficiencies.

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