MODERN DIAGNOSTIC STRATEGY OF ACUTE PNEUMONIA IN CHILDREN LIVING IN THE ARAL REGION (LITERATURE REVIEW)

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Abstract

Pneumonia is one of the most common infectious diseases worldwide and is a major cause of morbidity and complications, particularly among young children. The clinical course of pneumonia in children living in ecologically unfavorable regions, including the Aral region, has distinct features, which may be associated with environmental factors, immune system activity, and changes in the organism's reactivity. The Aral region is characterized by ecological problems. Factors such as air pollution, high concentrations of dust-salt aerosols, sharply continental climate, and limited water resources negatively affect the health of the population, especially children. As a result, respiratory system diseases, including acute pneumonia, are more frequent and severe among children. Nature and society form a single dynamic system, and changes in the biosphere inevitably affect human biological characteristics. Negative anthropogenic factors not only harm ecological systems but also pose a significant risk to human life and health. In the Aral crisis zone, extreme environmental conditions over several decades have been associated with large-scale chemical pollution of the territory due to high doses of pesticides and herbicides and industrial waste discharged into rivers feeding the Aral Sea. The drying of the Aral Sea

has led to drought, climate change, soil salinization, and disruptions in the population's water supply.

Relevance

In recent decades, respiratory diseases in children, particularly acute pneumonia, have remained one of the most significant medical and social problems worldwide. According to global statistical data, pneumonia is one of the leading causes of mortality among children under five years of age. Every year, millions of children suffer from this disease, and a significant proportion of cases occur in developing countries. Therefore, an in-depth study of the pathogenesis, clinical course, and diagnostic methods of pneumonia in children is one of the most important areas of modern pediatrics and pediatric pulmonology. Immunological mechanisms play an important role in the pathogenesis of pneumonia in children. During the inflammatory process, cytokines, particularly interleukins (IL-1, IL-6, IL-8, IL-10), act as major biological mediators that participate in the formation of the immune response and determine the intensity of the inflammatory process.

Many studies have reported a significant increase in the levels of IL-1, IL-6, IL-8, and IL-10 in children with pneumonia. In particular, IL-6 and IL-8 are considered among the most important biomarkers reflecting the activity of the inflammatory process. According to the results of scientific studies, the development of pneumonia in children involves a complex interaction between infectious agents, the immunological status of the body, and environmental factors. This is especially relevant in young children, in whom the immune system is morphologically and functionally immature, resulting in insufficient development of protective mechanisms against infection. This may contribute to a more severe course of the disease and the development of various complications. In recent years, particular attention has been

paid to studying the role of immunological mechanisms in the pathogenesis of pneumonia. In particular, the cytokine system, including interleukins, is considered one of the key regulators of the inflammatory process.

Conclusion

The analysis of the scientific literature indicates that acute pneumonia in young children is currently one of the most common and clinically significant diseases in pediatric practice. This condition remains highly relevant not only due to its high prevalence, but also because of its severe course, the possibility of various complications, and the high risk of mortality among children. The particularly high incidence of pneumonia in children under five years of age highlights the need for a deeper study of its pathogenetic mechanisms and the development of effective diagnostic methods.

According to data presented in the scientific literature, in addition to infectious factors, the immunological status of the organism plays an important role in the development of pneumonia. In young children, the immune system is not yet fully developed; therefore, the protective mechanisms against infectious agents are not sufficiently effective. This contributes to a more severe course of the inflammatory process and the intensification of clinical manifestations of the disease. From this perspective, the study of immunological parameters is of great importance for a deeper understanding of the pathogenesis of pneumonia.