

Changes in the Cytokine Profile in Mycoplasma Pneumonia in Children

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Abstract: Pneumonia remains the most common and severe disease of the respiratory system in children. Understanding the immune status and the pathogenetic role of cytokines will help to better understand the mechanisms of the development of the disease in pneumonia, to develop effective strategies for the diagnosis and treatment of the disease in frequently ill children. The aim of the scientific research is to study the status of cytokines in mycoplasma pneumonia in frequently ill children. Research materials and methods: 50 patients with pneumonia divided into 2 groups were examined to establish correlation with cytokine profile indicators: Group I - 25 frequently sick children with a typical etiology of pneumonia, II group - 25 children with mycoplasma pneumonia. The study showed that cytokines are one of the main mediators of pathogenesis and regulate the accumulation and activation of immune cells and inflammatory processes in the airways.

Keywords: mycoplasma pneumonia, frequently sick children, cytokine profile.

Compatibility. One of the modern diagnostic signs of a group of children who are often sick in pediatric practice is the state of anti-inflammatory and anti-inflammatory cytokines, but their role in the formation of the pathological process is only indicative. [2,11,15]. Cytokines are small secreted proteins that are key modulators of inflammation. They are produced in response to invading pathogens by stimulating, recruiting, and proliferating immune cells. Cytokines regulate intercellular and intersystemic interactions, stimulate or suppress cell growth, differentiation, functional activity and survival, apoptosis. They also ensure the coordination of the actions of the immune, endocrine and nervous systems under normal conditions and in response to pathological effects. Cytokines include interleukins, chemokines, interferons, and tumor necrosis factor. Cytokines are divided depending on the nature of the immune response and the source of their production. There are pro-inflammatory and anti-inflammatory cytokines. Anti-inflammatory cytokines are secreted by CD4+ T cells, macrophages and dendritic cells. The main pro-inflammatory cytokines are IL-1, IL-6 and TNF- α . Pro-inflammatory cytokines generally regulate the growth, activation, and differentiation of immune cells, as well as the homing of immune cells to sites of infection to control and destroy intracellular pathogens, including viruses [1,8]. Despite ongoing research into the treatment and prevention of pneumonia, the prevalence of these diseases remains high and approaches are insufficiently effective [5,9]. This indicates the need for further research aimed at improving the diagnosis. It is known that common respiratory diseases in children, including pneumonia, with the

development of chronic repeated infections lead to a violation of compensatory-adaptive mechanisms, defects of the cellular and humoral components of the immune state [3,6]. The main direction of scientific research is to study the mechanisms of development, to establish the characteristics of the clinical course, to evaluate the role of cytokines in children who are often sick with pneumonia, to develop pathogenetic methods of treatment and prevention.

A number of authors emphasize the importance of determining the cytokine profile in patients with pneumonia, and believe that the specific inflammatory process in the respiratory tract is caused by an imbalance of cytokines [4, 7,10,14]. The study of the role of cytokines in diseases remains relevant today. It is known that interleukins play a key role in various biological processes, including the activation, differentiation and proliferation of immune cells, as well as in the regulation of adaptive and innate immunity and inflammatory processes in the body.

The purpose of the scientific study: to study the status of cytokines in community-acquired pneumonia in children with frequent illnesses.

Materials and research methods: 50 patients with community-acquired pneumonia, divided into 2 groups, were examined to establish correlation with cytokine profile indicators: Group I - frequent patients with a typical etiology of pneumonia. 25 children, group II - 25 frequently ill children with pneumonia of mycoplasma etiology.

Research results. In the study of cytokine indicators in patients of groups I and II, a significant difference was found in almost all studied parameters compared to healthy children.

Endogenous production of anti-inflammatory and anti-inflammatory cytokines significantly increases compared to normal values in children who are frequently sick with Mycoplasma pneumonia. The increase in cytokines is the result of the influence of infectious factors that cause the development of pneumonia, their balance determines the course and prognosis of the disease. In the group of children who were frequently sick with the development of mycoplasma pneumonia, an increase in cytokines was observed in the blood, and the concentration of IL-4 was 2.2 times, IL-6 was 1.3 times, and the concentration of IL-8 was 2.4 times, IL-10 by 3.2 times and TNF- α by 1.3 times and IL-4 by 0.7 times, IL-6 by 1.4 times, IL-8 by 1.4 times brings 1.8-fold, 1.7-fold increase in IL-10 and 1.2-fold increase in TNF- α compared to patients with pneumonia of typical etiology. allows us to assume that it is a feature. A decrease in the level of IL-4 in children of group II, compared to patients of group I, indicates less specific allergic processes. An increase in the level of IL-6 in frequently sick children with atypical pneumonia indicates a sharp reserve capacity of the immune response, which stimulates the production of other pro-inflammatory and anti-inflammatory cytokines helps to encourage. including IL-10, TNF- α , and may contribute to the regulation of inflammatory processes in disease. IL-8 levels were higher in frequently ill children with atypical etiology, both in comparison to the norm and in patients with pneumonia involving neutrophils in the focus of inflammation. increase is part of a systemic disease. protective immunological reactions can cause tissue damage and disease progression. A high level of IL-10, along with positive anti-inflammatory effects, may be involved in suppressing the activation of immune cells, with subsequent negative consequences leading to a complex and prolonged course of the disease.

Studies have shown that interleukins play an important role in the pathogenesis of atypical pneumonia in children, and their level can serve as an indicator of the severity of the disease. The study of the dynamics of interleukins is necessary for the development of new diagnostic methods for children who are often sick with atypical pneumonia.

Summary. It was found that the immunological signs of atypical pneumonia can be high values of interleukins of the studied anti-inflammatory and anti-inflammatory categories compared to standard indicators, which indicates their importance in the pathogenetic mechanisms of the inflammatory process.

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