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EVALUATION OF THE EFFICACY OF IMMUNOMODULATING THERAPY FOR ACUTE OBSTRUCTIVE BRONCHITIS IN CHILDREN

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Annotation
Acute obstructive bronchitis is very common among young children, often leading to frequent relapses and severe complications. Under the influence of an infectious factor in children, various immunological changes are often observed, the body's ability to develop full-fledged post-infection immunity is sharply reduced. The aim of the study was to evaluate the effectiveness of immunomodulatory therapy in children with acute obstructive bronchitis. 65 children with acute obstructive bronchitis were examined. The immunological study was carried out in the clinical laboratory of the SamMI clinic. The number of T-lymphocytes (CD3), T-helpers (CD4), T-suppressors (CD8), and B-lymphocytes (CD19) was determined by a modified method. The concentration of serum immunoglobulins A, M, G in peripheral blood was determined according to the method of Mancini et al. The phagocytic activity of neutrophils was studied using latex particles. Immunological examination was carried out taking into account the nature of therapy: the 1st group of patients received traditional treatment with the inclusion of T-activin, and the 2nd group of children received only traditional treatment. It was found that the use of T-activin in the complex therapy of children with acute obstructive bronchitis increases the effectiveness of treatment, contributes to the normalization of the immune status and prevents the development of relapses of the disease.

Keywords: acute obstructive bronchitis, patients, immune status, immunomodulatory therapy.

Introduction

Among respiratory diseases, acute obstructive bronchitis (AOB) is widespread, leading to frequent relapses and severe complications [1,3,7,9]. Acute obstructive

bronchitis is a clinical variant of acute bronchitis, which is characterized by impaired bronchial patency due to edema of the mucous membrane, accumulation of bronchial secretions and bronchial hyperreactivity [2,5,6,10]. The disease is accompanied by inflammation of the bronchial tree, accompanied by a syndrome of bronchial obstruction, mainly of small and medium caliber. According to research in the field of pulmonology and pediatrics, about 20-25% of all acute bronchitis in children occur with symptoms of bronchial obstruction [9,11]. In addition to obstructive bronchitis, children often develop other acute obstructive syndromes: laryngotracheitis (croup), bronchiolitis, bronchial asthma. Under the influence of an infectious factor and other agents, various immunological changes are observed in children, and the ability to develop full-fledged post-infection immunity also sharply decreases [4,8,12]. Therefore, a promising area of research is the search and implementation of methods that have a corrective effect on the immune system in children with acute obstructive bronchitis.

Purpose of the Study

To evaluate the effectiveness of immunomodulatory therapy in children with acute obstructive bronchitis. Of the examined children, 39 (60%) were boys, 26 (40%) were girls.

Materials and Methods

65 children with acute obstructive bronchitis were examined. Children with acute obstructive bronchitis were aged from 6 months. up to 3 years, of which 39 (60%) were boys, 26 (40%) were girls. The diagnosis of the disease was established according to the classification adopted in 1996 at the Russian Symposium of Pediatric Pulmonologists.

The immunological study was carried out in the clinical laboratory of the SamMI clinic. The number of T-lymphocytes (SD3), T-helpers (SD4), T-suppressors (SD8), as well as B-lymphocytes (SD19) was determined by a modified method (Yu.F. Garib, 1995). The concentration of serum immunoglobulins A, M, G in peripheral blood was determined by the method of Mancini et al (1965). The phagocytic activity of neutrophils was studied using latex particles (Petrov R.V., 1988).

Immunological examination was carried out taking into account the nature of therapy: the 1st group of patients received traditional treatment with the inclusion of T-activin, and the 2nd group of children received only traditional treatment.

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Results of the Study and their Discussion

It has been established that in most children the disease occurs at the age of 3 months to 1 year. An analysis of family and hereditary history showed that 32% of sick children were born from related marriages, in 46.5% of children, relatives suffered from allergic diseases. Analysis of the initial premorbid background showed that in children with acute obstructive bronchitis, allergic diathesis was observed in 54.9%, anemia in 81.9%, rickets in 51.0%, paratrophy in 12.5% and malnutrition I-II degrees – in 48.7%. It was revealed that the average body weight at birth in children with AOB significantly exceeded (more than 3.5 kg) those in children with acute simple bronchitis and the control group.

The main changes in cellular immunity were expressed in a decrease in the number of T-lymphocytes (DM3) 45.2±0.8 compared to children in the control group 57.3±0.9% ($p<0.01$). More often there was an increase in the content of B-lymphocytes (DM19) in patients with OOB 18.1±0.3 ($p<0.01$), which is significantly higher than data with acute bronchitis 16.1±0.7% ($p<0.01$) and in the control group ($p<0.01$). There was a trend towards a decrease in T-suppressors (CD8) in relative and absolute terms in acute obstructive bronchitis in children.

The phagocytic activity of neutrophils (PAN) in the acute period of the disease is significantly suppressed in children with AR 45.1±0 ($p<0.01$). A particularly pronounced decrease in the increase in the phagocytic activity of neutrophils (FAN) was observed in children with relapses (3-4 times a year) of acute obstructive bronchitis. There was also a significant decrease in the phagocytosis index and the indicator of completed phagocytosis. Changes in the humoral link of immunity were accompanied by a decrease in the concentration of IgA ($p<0.01$) and IgG ($p<0.01$). An increase in the concentration of IgM ($p<0.01$) in children with AOB indicates that during the peak of the disease, the immune response is provided mainly by antibodies of the IgM class.

In children with acute obstructive bronchitis, who are on the traditional method of treatment, the improvement in clinical symptoms and immunological parameters was less pronounced. Thus, the level of T-lymphocytes ($p<0.01$) remained low, the levels of B-lymphocytes ($p<0.01$) were high. The content of immunoglobulins did not reach the levels of healthy children.

In order to correct immunological parameters, patients with AOB were prescribed T-activin subcutaneously at the rate of 2 μg/kg of body weight daily for 5 days and the sixth injection a week after the injections.

The use of T-activin against the background of traditional therapy has a pronounced positive effect, contributes to a more rapid reduction in the symptoms of intoxication and relief of various complications of the disease.

Comparative analysis of the immune response indicators against the background of traditional treatment and with the addition of T-activin revealed a significant increase in B-lymphocytes (DM19) 12.9±0.76%, an increase in FAN 57.9±1.34% and normalization of immunoglobulins A, M, G.

Conclusion

Thus, the use of T-activin in the complex therapy of children with acute obstructive bronchitis increases the effectiveness of treatment, contributes to the normalization of the immune status and prevents the development of relapses of the disease.

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