



CLINICAL AND IMMUNOLOGICAL PICTURE OF ACUTE OBSTRUCTIVE BRONCHITIS IN CHILDREN

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ABSTRACT

65 Children with acute obstructive bronchitis and 35 patients with acute bronchitis without obstruction aged 3 months and older were examined. up to 3 years. A dynamic immunological study revealed a decrease in the factors of phagocytic activity of neutrophils, cellular immunity and developing transient insufficiency of humoral immunity as the duration of the disease increased.

KEYWORDS: acute obstructive bronchitis, thymus gland, lymphocytes, T-activin, children, clinical and diagnostic observation.

INTRODUCTION

Acute obstructive bronchitis (AOB) is widespread among young children, leading to frequent relapses and severe complications. Obstructive forms of bronchitis occupy one of the leading places in the structure of childhood morbidity and mortality [1,2,5,8,10]. Analysis of risk factors in predicting the likelihood of developing a disease in children is essential for modern pulmonology. Among patients with AOB, acute pneumonia occurs 4 times more often and almost always has a complicated course. 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. In AOB, the T-link of the immune status changes, which contributes to frequent intercurrent diseases and allergic manifestations [3,4,6,7,9,11]. It is known that a decrease in cellular immunity is mediated through a violation of the production of biologically active hormone-like substances produced by the thymus. 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

The study of clinical and immunological picture of acute obstructive bronchitis in children.

MATERIALS AND RESEARCH METHODS

Under observation were 65 children with AOB, 35 patients with acute simple bronchitis and 20 healthy children. 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 AOB was established according to the classification adopted in 1996 at the Russian Symposium of Pediatric Pulmonologists. The diagnosis was based on the

identification of the main clinical signs of the disease with the exception of diseases that occur with a similar clinical picture.

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.

RESULTS OF THE STUDY AND THEIR DISCUSSION

An analysis of the examined patients showed that in most children the disease occurs in age from 3 months to 1 year. In the anamnesis of patients, the presence of respiratory diseases was often noted, which were complicated by acute obstructive bronchitis on the 2-3rd day. 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. An analysis of the initial premorbid background showed that in children with AOB, allergic diathesis was observed in 54.9%, anemia in 81.9%, rickets in 51.0%, paratrophy in 12.5% and malnutrition of I-II degrees - at 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 conducted immunological studies revealed a decrease in the factors of natural resistance of cellular



immunity and developing transient insufficiency of humoral immunity as the duration of the disease increased. 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 $57.3 \pm 0.9\%$ ($p < 0.01$). 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 $16.1 \pm 0.7\%$ ($p < 0.01$) and in the control group ($p < 0.01$). There was a trend towards a decrease in T-suppressors (DM8) in relative and absolute terms in AOB in children (Table 1).

The phagocytic activity of neutrophils in the acute period of the disease is significantly inhibited in children with AR 45.1 ± 0 ($p < 0.01$). A particularly pronounced decrease in

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.

Consequently, the humoral link of immunity in the midst of clinical manifestations of AOD is characterized mainly by an imbalance in the concentration of immunoglobulins in response to antigenic irritation.

Immunity Indices of Young Children with Acute Obstructive Bronchitis

Indicators	Healthy children n=25	Children with simple bronchitis n=35	Children with acute obstructive bronchitis n=65
Tlymphocytes, % (CD3)	$57,3 \pm 0,9$	$45,2 \pm 0,8$ $p < 0,01$	$40,1 \pm 0,3$ $p < 0,01$
T-helpers, % (CD4)	$45,8 \pm 0,8$	$39,9 \pm 0,2$ $p < 0,01$	$33,8 \pm 0,6$ $p < 0,01$
T- suppressors, % (CD8)	$8,4 \pm 0,3$	$6,9 \pm 0,29$ $p < 0,01$	$6,1 \pm 0,1$ $p < 0,01$
B-lymphocytes, % (CD19)	$12,3 \pm 0,89$	$16,1 \pm 0,76$ $p < 0,01$	$18,1 \pm 0,3$ $p < 0,01$
IgA, г/л	$2,18 \pm 0,06$	$1,65 \pm 0,08$ $p < 0,01$	$1,53 \pm 0,07$ $p < 0,01$
IgM, г/л	$1,02 \pm 0,1$	$1,39 \pm 0,3$ $p < 0,01$	$1,43 \pm 0,7$ $p < 0,01$
IgG, г/л	$9,03 \pm 0,55$	$7,89 \pm 0,87$ $p < 0,01$	$7,01 \pm 0,4$ $p < 0,01$
FAN, %	$59,5 \pm 1,24$	$47,2 \pm 0,86$ $p < 0,01$	$45,1 \pm 0,9$ $p < 0,01$

In children with AOB who were 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.

CONCLUSIONS

The conducted studies have shown a significant role of violations of individual parts of the immune response in the clinic of acute obstructive bronchitis in children. Analysis of the links of the cellular link of immunity in children with acute obstructive bronchitis showed a significant decrease in the relative and absolute number of T-lymphocytes and imbalance of immunoglobulins.

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