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IMMUNE COURSE OF ATOPIC DERMATITIS

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Abstract. A retrospective analysis of the developmental histories of all children, consultation with an ENT doctor, laboratory studies, including the determination of local and general immunity in sick children, was carried out. The suppression of all cellular reactions, a decrease in the reserve capacity of neutrophils and a decrease in the activity of local immunity were revealed. This explains the frequent and severe course of acute respiratory infections in these children

Keywords. Atopic dermatitis, children, general and local immunity

Introduction.

Summary. Our study involved 58 children aged 3 to 5 years with a diagnosis of atopic dermatitis. A retrospective analysis of the developmental histories of all children, consultation with an ENT doctor, laboratory studies, including the determination of local and general immunity in sick children, was carried out. The suppression of all cellular reactions, a decrease in the reserve capacity of neutrophils and a decrease in the activity of local immunity were revealed. This explains the frequent and severe course of acute respiratory infections in these children.

Scientists from all over the world have noted a constant increase in the number of people suffering from atopic dermatitis (AD) in various age groups and a noticeable aggravation of the clinical manifestations of dermatitis in the last decade [1, 2]. At present, the prevalence of AD among children in economically developed countries ranges from 9 to 30%, while in the general structure of allergic pathology among young children, AD accounts for 93%. Atopic dermatitis is one of the most common skin diseases, the onset of which occurs precisely in childhood and is characterized by a chronic recurrent course with an increase in severity, can be accompanied by frequent complications and the development of polyvalent sensitization

with the formation of various concomitant pathologies of many internal organs and systems in patients [3– 6]. It is also an important medical and social problem, characterized by a high prevalence and a steady increase in the incidence. It is the early onset, continuously recurrent course, the increase in the number of severe forms of this pathology that significantly reduces the quality of life (QOL) of patients [7, 8]. The rate of disability with blood pressure is 8%. Among the pathogenetic factors of allergic diseases, including AD, the following are distinguished: atopic diathesis, imbalance of intracellular regulatory mechanisms, changes in the coding of histocompatibility genes (HLA-system), non-immune mechanisms of allergic reactions (violation of membrane reception), activation of mechanisms for the release of mediators of lipid allergy (prostanoids, eicosanoids, hydroperoxyacids), impaired hemostasis, neurovegetative and peripheral circulation (instability of the vascular wall, impaired reception of endothelial cells), psychosomatic and psychophysiological abnormalities [9-11]. At the same time, Russian and European scientists have established that the main mechanism in the pathogenesis of AD is dysfunction of the immune system [12]. Changes in the immune system are recorded in children with various characteristics of the body: acute and chronic pathology, dietary habits, environmental triggers, and other

conditions [13–16]. In AD, a genetically determined hyperreactivity of the immune system in the humoral sector has been proven, which is combined with an imbalance of T- and B-lymphocytes, T-lymphocyte subpopulations, the formation of insufficient activity of T-suppressors, an imbalance in relation to Th1 / Th2 lymphocytes, which leads to increased production cytokines that support allergic inflammation, decrease in phagocytic processes. In school-age children with AD, a significant increase in IL-4 in saliva was revealed, depending on the severity of the disease. The role of such cytokines in the blood serum of patients with AD as IL-4, IL-5, IL-13, γ -IFN, TNF- α has been proven. In other allergic diseases, for example, in patients with bronchial asthma, allergic rhinitis, an increase in the salivary and serum levels of cytokines IL-4, TNF- α , IL-13 with a low level of γ -IFN was found [17, 18]. Thus, further study of the characteristics of immunopathogenesis in AD is an important aspect of clinical medicine for the timely correction of detected disorders, which will lead to an improvement in the condition of patients and an increase in their quality of life. Improving the quality of life in many diseases is an important component of therapy for these conditions [19-21].

Aim: Analysis of the characteristics of local and general immunity in children with atopic dermatitis.

Materials and methods of research:

We observed 58 children aged 3 to 5 years with a confirmed diagnosis of atopic dermatitis. The average age was 4.1 ± 0.6 . To include children in the study group, we excluded such comorbidities as endocrine pathology; heart defects, decompensated chronic diseases, congenital immunodeficiency states, oncological diseases. Also, the criterion for excluding children from the study was the intake of any immunocorrective agents during the last year. For an objective examination of the clinical state, all patients underwent a general blood test and IgE was determined by the enzyme immunoassay (reference values of the norm for children 3–5 years old

corresponded to 0–60 U / ml). To study local immunity, saliva was collected and the content of sIgA and lysozyme was determined. For the quantitative determination of lysozyme in saliva, the Assay Max Human Lysozyme ELISA method was used (normal values for children 3–5 years old are 0.1–0.87 ng / ml). The sIgA study was carried out by a quantitative enzyme-linked immunosorbent assay - Immunodiagnostik sIgA ELISA Kit (reference values of the norm for children 3–5 years old, 18–237 μ g / ml). A controlled clinical study was carried out in the conditions of children's polyclinics in the city of Voronezh. The examination of children was carried out in the clinical laboratories of the city of Voronezh with the informed consent of the parents. The study included collection of anamnesis and general physical examination, consultation with an otolaryngologist. The retrospective study included taking into account the number and duration of episodes of acute respiratory infections (ARI), taking into account the frequency of complications and the use of antibiotics for their correction. Statistical analysis of the data obtained was carried out using the application package "STATISTICA" - v 6.0 (Stat Soft Inc.), as well as the Microsoft Excel 2007 analysis package. The results obtained were presented as $M \pm SD$, where M is the arithmetic mean, SD is the standard deviation.

Results:

The study included 58 children. The average age was 4.1 ± 0.6 years. The number of boys - 27, girls - 31. All children suffered from ARI more than 9 times a year, mainly in the cold season (from October to May). Those children belonged to the group of frequently ill children (CHBD). All cases of ARI were complicated and required antibiotic therapy. Complications of ARI were mainly represented by sinusitis (13 children), bronchitis (19 children), laryngotracheitis (21 people), of which 15 patients had combined complications. From the anamnesis of life it was revealed: 9 patients had a decrease in appetite, 13 children showed selectivity in food in the form of refusal from

meat and dairy products. From the analysis of children's complaints, it is noteworthy that 47 patients (more than 50%) were worried about nasal congestion, 29 children (25%) had a cough in the morning. Consultation with an otolaryngologist showed that 49 children (85%) had a hypertrophic reaction from the Valdeer-Pirogov lymphatic ring. In 7 children (12%), hypertrophy of the palatine tonsils of the II-III degree was revealed. A sharp tuberosity of the tonsil surface was noted in 12 patients (21%), moderately pronounced was recorded in 19 children (33%). In 51 patients (88%) there was difficulty in nasal breathing, and in 9 children there was a discharge from the nasal passages of a mucous nature, in 50% of the observed swelling of the nasal mucosa was revealed. All children showed a multiple increase in peripheral regional lymph nodes of a densely elastic consistency up to 2 cm in size. As a result of the examination, most children (89%) with blood pressure showed a decrease in IgA in blood and saliva, which indicates a decrease in local immunity and, as a consequence, a tendency to develop inflammatory diseases. The sIgA indices in saliva in children were reduced to an average value of $12.2 \pm 1.4 \mu\text{g} / \text{ml}$ (10.4–14.6 $\mu\text{g} / \text{ml}$). At the same time, the normal content of B-lymphocytes was revealed in the blood of these children. Consequently, the change in local immunity factors is the main factor in the development of frequent ARIs in children with AD. This confirms the literature data that children with AD belong to the group of frequently ill children 2 times ($p < 0.01$) more often than their peers who do not have signs of AD. The study of hemogram and immunogram parameters in children with AD revealed a significant decrease in the number of total lymphocytes, the level of T-lymphocytes, T-helpers, T-cytotoxic and O-lymphocytes, and a decrease in the reserve capacity of neutrophils. Thus, we can state a clear immunosuppressive state of the immune system: suppression of all cellular reactions, a decrease in the reserve capacity of neutrophils.

Conclusion:

Children with atopic dermatitis have an immunosuppressive state of the immune system: suppression of all cellular reactions, a decrease in the reserve capacity of neutrophils and a decrease in the activity of local immunity. This explains the more frequent and more severe development of ARI in such children than in the general population, which requires timely correction of the detected disorders and will lead to an improvement in the condition of patients and an increase in their quality of life.

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