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Original Research

Features of the Immunological Nature in Children with Atopic Dermatitis

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ABSTRACT:
In recent years, the most important role in the regulation of immunopathological mechanisms, in particular allergic reactions, has been assigned to cytokines. The aim of the study is to assess the characteristics of the immunological nature in children suffering from atopic dermatitis. The majority of patients have a burdened heredity for allergies and an increased level of IgE. Apparently, the severity of AD is determined not by the level of Ig E in the blood serum, but by the influence of triggers on the development of allergic inflammation. The results obtained will allow one to better navigate the functional disorders of the immune system of children with AD and can be used for adequate therapy.
Key words: atopic dermatitis, children, allergy, cytokines, immunity, immunopathogenesis, interleukins

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INTRODUCTION

According to modern concepts, AD is a multifactorial disease, the development of which is closely related to genetic defects in the immune response and the negative effects of adverse environmental influences. It was found that the effect of these factors determines the rate of development of blood pressure, especially in young children. Atopic dermatitis is one of the important medical and social problems, as the prevalence of the disease is growing steadily. Existing epidemiological studies indicate a high prevalence of blood pressure in children, which ranges from 10 to 30% in different countries. According to various studies, AD that began in childhood continues to persist in adults in 40-60% of cases [1]. Atopic dermatitis is a multifactorial disease, which is based on a genetic predisposition and the negative impact of adverse environmental influences.

Objective of the study: to assess the features of the immunological nature in children suffering from atopic dermatitis.

MATERIALS AND METHODS

During the period 2019 - 2020, we observed 72 children with atopic dermatitis aged from 1 month to 18 years; 52 of them were examined during the period of exacerbation and 20 during the period of remission of the underlying disease. We examined 61 patients aged 3 months to 18 years (4.8 ± 3.65 years) with atopic dermatitis (main group) and 11 children (age 5.2 ± 1.9 years) without signs of atopy (comparison group). Undergoing treatment at the dermatology department of the clinic of the Tashkent Pediatric Medical Institute. Among the studied children there were 46 boys (63.8%) and 26 girls (36.2%).

We have studied the content of pro (TNF-α) and anti-inflammatory (IL-4, IL-6) cytokines in the blood serum of patients with atopic dermatitis. To determine the content of cytokines in blood serum, blood samples were taken from a finger or from a vein into dry plastic tubes. After treatment of the blood clot, the blood sample was centrifuged at 2500 g, and the serum was taken using a pipette, which was used for analysis (the serum was frozen once at a temperature of –18 ° C to –24 ° C and stored until analysis for no more than a month).

To assess the cytokine profile, the content of TNF-α, IL-4 and IL-6 (pg / ml) was determined in dynamics in the first three days of the exacerbation period and after 1 month from the start of the course of treatment. The level of cytokines was determined by the method of enzyme-linked immunosorbent assay. The studies were carried out during an exacerbation of the disease.

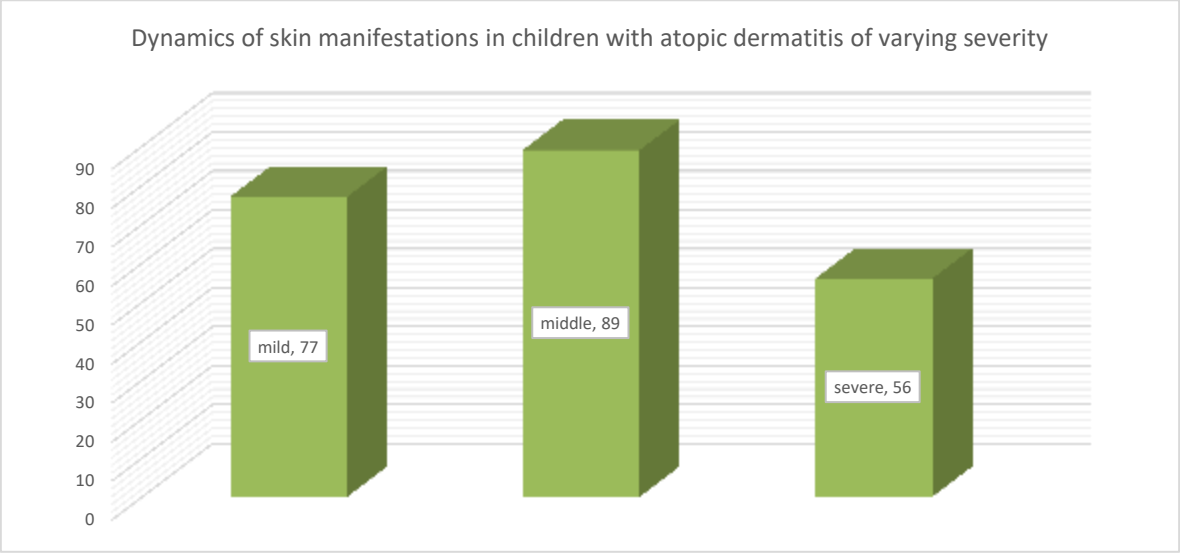
Descriptive statistics of qualitative features are presented in absolute and relative frequencies (in percent). The critical value of the significance level was considered p = 0.05. Research and interpretation of the results were carried out in accordance with the domestic industry standard, identification The study included 40 patients aged 1 to 18 years.

RESULTS

As a result of the study, it was revealed that in children with both atopic dermatitis and without signs of allergic inflammation, almost all interleukins studied by us can be present. However, their presence and individual level values have a different range (Table 1). Changes in the serum content of the proinflammatory cytokine TNF-α did not have such a definite and pronounced character, depending on the stage of the process. A significant increase in its level was observed in severe AD, both during exacerbation of the disease and during remission, as well as during remission in patients with moderate disease. With a mild course of AD, its level did not differ from the control values.

Indicators of Ig E level depending on the severity: in patients with mild AD Ig E 381.5 ± 140.5 IU / ml, with moderate severity 294.754 ± 69.86 IU / ml, in patients with severe AD, Ig level E 481.749 ± 138.76 IU / ml. Thus, the severity of allergic manifestations does not depend on the level of Ig E - with mild severity, the amount of Ig E is higher than with moderate severity. Apparently, the severity of AD is determined not by the level of Ig E in the blood serum, but by the influence of triggers on the development of allergic inflammation.

The level of cytokines in patients with varying severity during exacerbation in patients is presented in Chart 1.



In 38 patients, the cytokine profile of IL-4 and IL-6 was studied in the first three days from the moment of admission and 1 month after the start of treatment - on the 35-40th day, depending on the severity of AD. Clinically, patients varied in the severity of itching from mild in mild to painful with sleep disturbance in severe. As can be seen from diagram 1, the level of IL-4 in the blood serum with mild AD is slightly lower than with moderate and severe AD, but does not differ significantly. The level of IL-2 in severe AD is lower than in patients with mild to moderate severity, but also does not differ significantly. We assume that the lack of a statistically significant difference may be due to the small sample size. The level of IL-6 production did not depend on the severity of AD.

To assess the cytokine profile, we analyzed similar indicators of the levels of IL-4 and IL-6 in children without signs of allergy of the same age and sex. It is important to note that the level of IL-4 in patients with AD was higher than in the group without allergies, but significant differences ($p < 0.02$) were found only in patients with moderate severity of AD. The content of IL-6 was also higher in patients with AD, however, we did not find significant differences with the control group.

CONCLUSIONS

Thus, it was found that the levels of cytokines in the blood serum reflect the current state of the immune system of patients with AD. Summing up the study of the serum cytokine content in patients with AD of varying severity, we can conclude that there is a tendency to increased production of anti-inflammatory cytokines (IL-4 and IL-6) during exacerbation of the disease and an increase in the synthesis of pro-inflammatory cytokines (TNF -α) during remission. This may indicate the activation of the production of cytokines of both Th2 and Th17 types. In general, the polarization of Th2 and Th17 towards an increase in functional activity in the acute period corresponds to the classical concepts of the immunopathogenesis of atopic inflammation.

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