American Journal of Interdisciplinary Research and Development
ISSN Online: 2771-8948
Website: www.ajird.journalspark.org
Volume 30, July - 2024

CLINICAL AND IMMUNOLOGICAL FEATURES OF ATOPIC DERMATITIS IN CHILDREN

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Abstract
Clinical and immunological features of atopic dermatitis (AtD) were studied in children. IgE-mediated AtD was diagnosed in 76.3% of patients, non-IgE-mediated AtD in 23.7%. A decrease in the relative number of CD3+CD8+ and immunoregulatory index in the peripheral blood was noted in patients with IgE-mediated and non-IgE-mediated AtD. A decrease in the number of CD25+ and an increase in CD16+CD56+ was detected in children with IgE-mediated AtD. In patients with non-IgE-mediated AD, an increase in CD25+ and a decrease in CD16+CD56+ were noted.

Keywords: "atopic march", atopic dermatitis, allergic rhinitis, sensitization, interferon gamma, interleukin-4.

Introduction

Atopic dermatitis (AD) is a chronic skin disease with a long course associated with disturbances in the structure of the innate skin barrier and the immune system.
Allergic diseases have become widespread at present.
According to WHO, they affect 25 to 35% of the world's population [1,3].
Atopic dermatitis (AD) in developed countries occurs in 10-30% of the child population [2,4].
In the structure of dermatoses in children, it makes up from 20 to 66% [3,5].
The main symptoms of the disease are increased dryness of the skin (xerosis), inflammation and itching.
AD most often appears before the age of 1-2 years and decreases in adolescents and adults.
The prevalence of atopic dermatitis among children is up to 20%, among adults - 2-8%.
This is one of the most common skin diseases.
"Atopic march" (AM) is a natural development of the atopic process, characterized by the progression of allergic diseases from atopic dermatitis (AD) to allergic rhinitis (AR) and bronchial asthma (BA).

Objective:

To study the features of the production of markers of allergic inflammation depending on the nature of the course of AD in children.
Patients and methods: the study included 94 children suffering from AD, an assessment of the severity of the disease was carried out, the serum level of total IgE, IL-4, INFγ and sIL-

2R was determined. Statistical processing of the results was performed using the STATISTICA 10.0 software package.

With a parametric distribution of a quantitative feature, the characteristic of the indicator is presented as an arithmetic mean with a standard deviation (M ± o); Student's t-test was used to determine the reliability of differences in values.

Comparison of values with a nonparametric distribution was performed using the Kruskall- Wallis criterion; the reliability of the difference in frequencies was determined using Fisher's exact test or Pearson's x 2, depending on the sample size.

Differences in indicators were considered reliable at a significance level of $p < 0.05$

Results

The present study included 3-year-old children with AD who visited an allergist-immunologist for the first time.

At the first visit, mild AD was diagnosed in 22.3% (21/94), moderate in 77.7% (73/94) of the children.

The average SCORAD index was 30.5 ± 8.77 points.

Clinical and laboratory examination showed that in 34.0% (32/94) of cases, AD was combined with AR, while the prevalence of AR in the groups with mild and moderate AD was comparable (19.0% (4/21) vs 38.4% (28/73), $p = 0.081$). The burden of family history of allergy pathology was comparable between the groups and amounted to 88.7% (55/62) in children with AD and 87.5% (28/32) in the group of patients with AD and AR ($p = 0.5522$), respectively.

In 50% (47/94), ARVI-induced episodes of broncho-obstruction were recorded in the anamnesis, including more often in children with concomitant AR (68.8% (22/32) vs 30.6% (19/62), $p = 0.0003$). When assessing the skin condition, it turned out that in children with dermatological manifestations, the SCORAD index was higher than in those with combined pathology (respectively, 32.3 ± 9.17 vs 22.2 ± 2.29, $p < 0.05$)

Among the patients included in the study, AR was diagnosed in 32/94 (34.0%) children as a comorbid pathology.

When analyzing the skin condition, it turned out that in patients with AD and AR, the SCORAD index was lower (32.3 ± 9.17 points vs 22.2 ± 2.29 points, $p < 0.05$).

Food sensitization in children of both groups was dominant and did not differ between the groups (90.6% (58/62) and 93.8% (30/32), $p = 0.4637$, respectively, for AD and comorbid pathology), however, in children with a combination of AR and AD, in almost all cases, food sensitization was combined with respiratory (90.6% (29/32)), while with monopathology, AD was found in only half of the cases (43.8% (28/62)) (Table 1).

Table 1 Features of sensitization in children with a combination of atopic dermatitis and allergic rhinitis

Group of allergens	AtD (n= 62)	AtD+AR (n= 32)	R
Food	46,9% (30/62)	3,1% (1/32)	p<0,0001
Inhalation	9,7% (6/62)	6,2% (2/32)	p>0,005
Food + inhalation	45,2% (28/62)	90,6% (29/32)	p<0,0001

Moreover, children with concomitant AR had higher levels of total blood sugar in the blood serum. IgE (Me 123 [Q1- Q3 67–156] МЕ/мл vs Me 53 [Q1- Q3 5–108] МЕ/мл, p < 0,001), IL- 4 (Me 12,0 [Q1- Q3 8,7–16,1] пг/мл vs Me 6,0 [Q1- Q3 2,2–12,1] пг/мл, p = 0,04) и sIL- 2R (Me 2,1 [Q1- Q3 0–20] МЕ/мл vs Me 0 [Q1- Q3 0–12,9] МЕ/мл, p = 0,34).

A history of broncho-obstructive episodes was associated with a higher likelihood of AM (OR 2.3 [95% CI 1,18–4,54].

Discussion

The addition of AR in children with AtD is considered as a progression of IgE-dependent pathology, despite the fact that patients with comorbid pathology had a lesser severity of skin symptoms in our study.

A higher level of IgE in the combined form of allergopathology is probably due to more intense production of IL-4.

In addition, a higher level of sIL-2R indicates the maintenance of the inflammatory process.

Conclusion

The combination of AtD with AR in 3-year-old children is characterized by a lesser severity of the skin syndrome compared to AtD monopathology, but a higher frequency of sensitization to inhaled allergens.

AM is associated with a more pronounced Th2 phenotype of the immune response, as well as higher production of markers of early activation of T-lymphocytes. In children with AD, a history of broncho-obstructive episodes increases the likelihood of developing AR by more than 2 times.

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