

Factors Affecting Development and Exacerbation of the Atopic Dermatitis in Children

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Abstract Study Purpose. To study the factors affecting to the development and exacerbation of the atopic dermatitis in children. Material and Methods. 100 children with the diagnosis of atopic dermatitis (AD) aged from 2 to 13 years were under observation. A study of the risk factors of the implementation of the allergy was conducted using a questionnaire designed in accordance with the goals and objectives of the study as well as scarifying skin tests with non-bacterial allergens to determine the hypersensitivity to suspected causative allergens. Results. During the study, in children an important exogenous trigger factors were identified (food, inhalation, drug allergens), including regional causing the debut and relapse of AD. Certain factors, including aggravating the effect of trigger factors: climatic, social, psycho-emotional, concomitant diseases were determined. Conclusion. Factors affecting to the development and exacerbation of AD are associated with age periods. By the way, food factors prevailed among children in the first three years of life. Among children aged 4-6 years prevailed social, epidermal, medicinal risk factors, while among children aged 7-13 years additional factors like a climatic, psychoemotionalis is included.

Keywords Atopic dermatitis, Risk factors, Children

1. Introduction

According to WHO, allergic pathology occupies one of the leading places in the structure of morbidity, and in the next 20-30 years it will come out on top. Dermatoses account for 56-66.4% of all forms of allergic diseases, among which atopic dermatitis predominates [1,2]. Atopic dermatitis (AD) is a chronic relapsing disease of inflammatory-allergic genesis, which is characterized by a complex of signs of atopy, as well as vegetative-vascular disorders, local systemic changes in immune reactivity and provoking environmental factors with itching, dryness and lichenification of the skin [3,4]. The basis for successful therapy and optimal prevention of atopic dermatitis is the identification of causative factors of the disease [6,8]. Risk factors for development, clinical course and pathogenesis of allergic diseases.

2. Purpose of the Study

To study the factors contributing to the development and exacerbation of atopic dermatitis in children.

3. Material and Research Methods

Under our supervision in the City Health Center No. 12 in Dushanbe in 2012-2015. there were 100 children aged 2 to 13 years with a diagnosis of Atopic Dermatitis. Of the total number of patients, 40.0% initially sought help from the Scientific and Clinical Center for Pediatrics and Pediatric Surgery of the Ministry of Health and Social Protection of the Republic of Tajikistan. Due to the fact that at the Department of Family Medicine No. 2 of the Avicenna TSMU Abuali ibn Sino conducts research work related to the subject of this pathology, further examination and treatment of patients were carried out jointly.

Examination of patients included a retrospective analysis of the history of the development of the child (form No. 112), laboratory examination (general blood count, urine, fecal coprology), skin scarification allergological tests, consultation of narrow specialists (pediatrician, dermatologist, allergist, immunologist).

The study of risk factors for the implementation of atopic dermatitis in children was carried out according to a questionnaire developed in accordance with the goals and objectives of this study. Among the children included in the survey, boys prevailed - 63.0%, girls were 37.0%. Allergological examination included the determination of hypersensitivity to suspected causal allergens using skin prick tests with non-bacterial allergens. Scarification allergy tests with household, epidermal, pollen, food allergens were placed on the skin of the back once at the end of treatment.

4. Results and Its Discussion

The main forms of AD were: exudative, which was observed in 58.0% of children, erythematous-squamous - in 22.0%, erythematous-squamous with lichenification - in 12.0%, lichenoid - in 5.0%, pruriginous - in 3.0% of patients. Depending on the severity of the process, the patients were mild - 55.0%, moderate - 37.0%, severe - 8.0%.

In the course of a study aimed at identifying risk factors for the development of AD in children, important exogenous trigger (food, inhalation, drug allergens) factors, including marginal ones, causing the onset and relapses of AD, were identified. Factors, including those aggravating the effect of trigger ones, were determined - social, psycho-emotional, concomitant diseases. The structure of these factors is shown in Table 1.

Table 1. Factors contributing to the development and exacerbation of AD in children

Factors	abs. n=100
Trigger (starting)	
food	47
Inhalation (pollen, dust, epidermal)	29
Medicinal	24
Aggravating trigger factors	
Psycho-emotional	16
Social	33
climatic	21
Concomitant pathology	thirty

In the etiopathophysiology of AD in children, an important role was played by psychoemotional factors that contributed to the exacerbation of the disease in older children (Table 2).

Table 2. Psychoemotional factors contributing to the development of AD

Factors	abs. (n=16)	%
Psychotraumatic situations	7	43.7
Incomplete family	5	31.2
Psycho-emotional stress	4	25.0

Psycho-emotional, psycho-social stresses, psycho-traumatic situations (stress, tensions at school, family, quarrels, scandals) were the dominant factors in the children of preschool and school age examined by us, which induced and maintained the pathological process in AD. In addition, it should be noted that children with AD are more prone to the development of anxiety and depression than others, so the identification of psycho-emotional factors is of particular importance in this group of patients.

Of great importance in the development and exacerbation of the disease were social factors, which are reflected in Table 3.

As can be seen from Table 3, among the social factors in the development of the disease, socio-biological ones were

of great importance, namely, an unhealthy lifestyle of the family, bad habits of family members, diseases of parents and close relatives, especially for atopy.

Table 3. Social factors contributing to the development of AD

Factors	abs. (n=33)	%
Socio-biological	14	42.4
Socio-economic	eleven	33.3
Socio-hygienic	5	15.2
Social	3	9.1

Of the socio-economic factors, a low level of material and living conditions of the family was noted. Parents could not provide a full course of treatment for sick children, and the disease progressed, turning into a widespread and chronic course.

On the part of unfavorable social and hygienic factors, there was poor care, unclean maintenance of both younger children - 58.0% (rare change of diapers, diapers, overheating, excessive sweating, which caused skin maceration), and older children - 20.0% (children were not accustomed to the basics of personal hygiene).

Among the social and household factors, it was noted that some families lived in damp rooms.

An important feature of the skin with AD is its hyperreactivity - increased sensitivity to fluctuations in temperature and humidity. In the course of the study, it was especially noteworthy that in 82.0% of patients the remission period was prolonged in the warm season. There was a clear improvement in well-being associated with a decrease in itching, clinical manifestations, especially in patients with severe (lichenoid, pruriginous forms of AD) disease. In this regard, we studied climatic factors that contribute to changes in the course of the disease (Table 4).

As a result of the study, it was found that the destroyed epidermal barrier of the skin of children with AD was extremely sensitive to climatic factors. So, in 82.0% in the hot summer season, the manifestations of the skin process subsided, which was expressed in the regression of exudative elements, infiltration, lichenification. Patients often had periods of remission with lengthening. All this was considered by us as a beneficial effect of elevated atmospheric temperature, solar ultraviolet radiation, which are features of the hot climate of the Republic of Tatarstan, which contributed to the improvement of skin microcirculation, physiologically enhanced sebum secretion, the skin was less exposed to aeroallergens.

Table 4. Climatic factors contributing to changes in the course of blood pressure in children

The course of blood pressure	spring-summer period		Autumn-winter period	
	abs.	%	abs.	%
Improvement	82	82.0	5	5.0
Deterioration	4	4.0	75	75.0
Without change	14	14.0	20	20.0

Table 5. Results of allergic tests in sick children with atopic dermatitis (n=38)

Allergens	Form of the disease			
	erythematous-squamous n=18 (45.0%)	erythematous squamous with lichenification n=12(30.0%)	lichenoid n=5 (12.5%)	pruriginous n=3 (7.5%)
food	12 (66.6%)	6 (50.0%)	4 (80.0%)	2 (66.6%)
Medicinal	3 (15.6%)	1 (8.5%)	1 (20.0%)	2 (66.6%)
household	2 (11.1%)	3 (25.0%)	2 (40.0%)	1 (33.3%)
pollen	4 (22.2%)	2 (16.6%)	3 (60.0%)	1 (33.3%)
epidermal	2 (11.1%)	1 (8.5%)	1 (20.0%)	1 (33.3%)

As can be seen from Table 5, the most frequent sensitization of patients with AD was noted to food allergens - more than 65.5%. Among food allergens, hypersensitivity was observed to cow's milk - 81% of patients, then chicken egg - 69%, citrus fruits - 66%, regardless of the form of the disease. Following food allergens in the development and exacerbation of AD in patients, the leading place was occupied by sensitization to household allergens: house dust, hypersensitivity to which manifested itself in 9 (23.7%) patients. Drug allergy (erythromycin, gentamicin, ceftriaxone, biseptol, acetylsalicylic acid) was detected in 7 (18.1%) patients. To pollen allergens (poplar, walnut, plane trees, pollen of cereal plants, corn, rye, sunflower) hypersensitivity was detected in 10 (26.5%) patients. Epidermal sensitization to wool (cats, dogs, sheep, cows) of animals was observed in 5 (13.0%) patients. The study showed that the majority (54.0%) of the examined had cross-allergy, 46.0% - monovalent allergy to food, household, medicinal, pollen and epidermal allergens. In 11 (28.9%) patients, combined allergy to two or more allergens of different origin prevailed, i.e. polyallergy. The importance of regional allergens (walnut, persimmon, melon, sheep meat, plane tree pollen) in the development of AD was revealed, sensitization to which 30.0% of patients had. In 11 (28.9%) patients, combined allergy to two or more allergens of different origin prevailed, i.e. polyallergy. The importance of regional allergens (walnut, persimmon, melon, sheep meat, plane tree pollen) in the development of AD was revealed, sensitization to which 30.0% of patients had.

It should be noted that the study drew attention to the high incidence of concomitant diseases (n=25), which aggravated the course of the underlying disease (Table 6).

As can be seen from Table 6, concomitant diseases of a non-allergic nature were found in 25.0% of patients. Of these, diseases of the digestive tract (gastritis, cholecystitis, pancreatitis) had 40.0% of patients, anemia was detected in 48%, acute respiratory viral infections (nasopharyngitis, bronchitis, pharyngitis) - in 40% of patients. Concomitant diseases of an allergic nature were diagnosed in 52.0% of patients in the form of bronchial asthma - 12%, hay fever -

16%, allergic conjunctivitis - 24%, urticaria - 20%, drug - 16% and food allergies - 52% of patients.

Table 6. Comorbidities in children with AD

Pathology	abs. n=25	%
Diseases of the broncho-pulmonary system (bronchitis, pneumonia)	10	40.0
Blood disorders (iron deficiency anemia)	12	48.0
Diseases of the endocrine system	10	40.0
Diseases of the nervous system	eleven	44.0
Chronic foci of infection	19	76.0
Allergic diseases (hay fever, conjunctivitis, urticaria)	13	52.0

5. Conclusions

Thus, the factors contributing to the development and exacerbation of AD in children are associated with age periods. So, food predominated in children of the first three years of life, in children of 4-6 years old, social, epidermal, medicinal reasons prevailed, and in children of 7-13 years old, additional factors were included - climatic, psycho-emotional.

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