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The effect of violations of the microelement status on the course of the disease in children with atopic dermatitis

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Abstract. Atopic dermatitis (AtD, atopic eczema, atopic eczema/dermatitis syndrome) is a chronic inflammatory skin disease that usually begins in early childhood, can continue or recur in adulthood.

The study of atopic dermatitis remains one of the most urgent problems of modern dermatology in connection with the widespread, severe course, frequent relapses, and the disease of people of the most childish age. According to statistics, in children, it occupies one of the first places for the reasons of patients ' referral to a dermatological clinic, it is responsible for 30-40% of all skin diseases and 30-40% of cases of hospitalization in a dermatological hospital. The disease occurs in people of both sexes and in different age groups. The incidence ranges from 6.0% to 15.0%.

Keywords. Atopic dermatitis, trace elements, the course of atopic dermatitis.

I. Introduction.

In recent years, due to the deterioration of the environmental and economic situation, the problem of deficiency states caused by a lack of essential trace elements (ME) has become particularly relevant. Studies in recent years indicate that the provision of children with micronutrients is lower than the physiological needs. In a significant part of children, multivitamin deficiency is combined with insufficient intake of a number of macro - and microelements and a decrease in their content in biological fluids[1,2].

Unbalanced nutrition leads to disorders and an increase in the frequency of violations of the micronutrient status of children. Of concern is the fact that every third child is already sensitized to certain antigens from the newborn period. Micronutrient deficiency is also an important risk factor for disease in children [3,4].

The mechanisms of the development of micronutrient deficiency in a child are different. Traditionally, they are associated with poor nutrition, and the role of ecopathological factors is practically not taken into account[5]. At the same time, in Uzbekistan, many regions have a pronounced imbalance of trace elements in the environment[6].

Essential trace elements play an important role in the functioning of the human body, directly or indirectly participating in all processes of life. Their imbalance can have an extremely negative impact on the viability of cells and the functional state of the body as a whole . This is especially true in situations involving allergic components[7,8].

In the modern world, medical technologies are beginning to spread to increase the functional capabilities of the body by optimizing mineral metabolism using preparations containing the necessary macro- and microelements, vitamins and other biologically active substances[9].

Having comparable effectiveness with traditional medicines, they have a number of

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advantages, including the absence of side effects, more adequate and targeted correction of metabolism, the immune system and their regulation. This opens up the possibility of purposeful influence on the functional state of the human body, but requires an understanding of the corresponding interdependencies.

The main purpose of the study was to examine the disorders of the microelement state of the body in patients with atopic dermatitis and their role in the course of the disease.

To achieve this goal, the aim was to evaluate the trace element balance (Zn, Fe, P, Cu, Se, Na, Ca, K, Mg) in the blood serum of patients with atopic dermatitis.

Materials and methods: The study involved 28 patients with various forms and severity aged from 2 months to 18 years. The analysis of the content of trace elements in the blood serum was performed in the laboratory of the "Regional Multidisciplinary Children's Hospital" (Samarkand) by atomic absorption spectrophotometry (AAS). Trace elements, selenium were determined by atomic absorption on the Japanese atomic absorption spectrophotometer "Hitachi" -208, macronutrients: zinc and magnesium by the kinetic method of copper, iron, potassium, calcium-by the colorometric method on the photometer "Hospitex, Master plus" (Finland).

Results and discussions: In order to establish the relationships, the correlations between the indicators of elemental status and severity were studied in 28 patients (Table 1). The results obtained on the content of zinc, potassium, calcium, selenium, iron, magnesium, copper, sodium and phosphorus in the blood of patients generally coincide with the literature data. In most patients (respectively 25, 7, 22, 21, 26, 19, 2, 5, 12) the level of zinc, potassium, calcium, selenium, iron, magnesium, copper, sodium and phosphorus in the blood was reduced and ranged from 5.8 to 10.0 mmol/l, (normal 11.0-22.0 mmol/l), on average 7.86 mmol / l; 3.0-3.3 mmol/l, (normal 3.5-5.5 mmol/l), on average 3.07 mmol/l; 1.99-2.16 mmol/l, (normal 2.2-2.7 mmol/l),average 2.08 mmol/l;7.4-10.0 mmol/L,(normal 10-30mmol/l), average 8.7 mmol/l;0.60-0.72 mmol/L(normal 0.78-1.10 mmol/l), average 0.66 mmol/L; 8.0-28.0 mmol/L, (normal 12.0-25 mmol/l.), on average 18 mmol/l;127-152 mmol/l, normal (135-155mmol/l), on average 139.5 mmol/l; 0.60-0.76 mmol/l, normal (0.68-1.81 mmol/l), on average 0.68 mmol/l. accordingly.

Tab. №1.

Trace elements (mmol / L)	Number of patients (norm)	Number of patients (decrease)	Degree of severity	
			Medium (mmol/L)	Heavy (mmol / L)
Zn(11-22)	3	25	6,4	5,2
K(3,5-5,5)	21	7	3,1	2,1
Ca(2,20-2,70)	6	22	1,9	1,7
Se(1,14-1,9)	7	21	1,06	0,8
Fe(10-30)	2	26	8,7	4,8
Mg(0,78-1,10)	9	19	0,66	0,20
Cu(12-25)	26	2	17,5	5,6
Na(135-155)	23	5	139,5	110
P(0,68-1,81)	16	12	0,68	0,25

The level of trace elements in the blood of patients with moderate to severe forms of the disease looked somewhat unusual. A

decrease in the level of trace elements: zinc, potassium, calcium, selenium, iron, magnesium, copper, sodium and phosphorus in the moderate form was observed in all patients, the blood content averaged 6.4 mmol/l; 3.1 mmol/l; 1.9 mmol/l; 1.06 mmol/l; 8.7 mmol/l; 0.66 mmol/l; 17.5 mmol/l; 139.5 mmol/l; 0.68 mmol/l, respectively, and the total deficiency of trace elements were observed in all 12 patients with severe form .

With a pronounced clinical manifestation of the disease, there was also a deficiency of all essential trace elements: zinc, potassium, calcium, selenium, iron, magnesium, copper, sodium and phosphorus.

Conclusions: The obtained results strongly indicate the relationship of the microelement status with the severity of the disease, the degree of clinical manifestation of atopic neurodermatitis. In addition, in atopic neurodermatitis, positive correlations were found between the content of selenium, zinc, and iron, and an increase in the level of Ig E, which are most pronounced in patients with severe disease. The revealed changes in the trace element status in atopic neurodermatitis indicate violations of the protective properties of the body, and the feasibility of a comprehensive study of the immune and trace element status to determine ways to correct immune disorders using trace elements.

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