

# Activated Glaucanite in the Treatment of Endogenous Intoxication in Patients with Atopic Dermatitis

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**Abstract:** Improving approaches to the diagnosis and treatment of diseases associated with endogenous intoxication syndrome is one of the socially significant problems of practical dermatology. It is of particular importance for atopic dermatitis.

Endogenous intoxication was characterized by an increase in the concentration of sorption capacity of erythrocytes (SSE) by 1.5 and of medium molecule peptides (MMP) by 2.1 times compared to the healthy control group against the background of hyperproduction of total IgE, antimicrobial peptides LL-37 by 2.9 times ( $P < 0.05$ )

The use of activated glaucanite (fatifiltrum) in complex therapy in patients with atopic dermatitis contributes to a more pronounced reduction in the degree of endogenous intoxication of the body, the SCORAD index by 4.04 times, than standard therapy. The data obtained indicate the detoxifying ability of activated glaucanite "fatifiltrum", which can be recommended for widespread use in dermatological practice.

**Keywords:** atopic dermatitis, endogenous intoxication, bacterial sensitization, total IgE, antimicrobial peptides LL-37, staphylococcus spp., activated glaucanite, fatifiltrum

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## 1. Introduction

Improving approaches to the diagnosis and treatment of diseases associated with endogenous intoxication syndrome is one of the socially significant problems of practical dermatology. [1,2,5,6,16,18] Since endogenous intoxication of the body plays a certain role in the occurrence of various pathological conditions. [4,7,9] Almost all severe skin diseases are accompanied by endogenous intoxication, and in many cases it determines the outcome of the disease. Among them, special attention is paid to atopic dermatitis. [3,7,8-11]

The morphofunctional state of the gastrointestinal tract and hepatobiliary system plays an important role in the genesis of AD. [15-209] It is known that in early childhood, disturbances in the parietal digestive system are of great importance, causing the formation of food and bacterial allergies, imperfect enzyme systems, dysbacteriosis, leading to liver diseases and metabolic disorders [21,22].

In the development of endogenous intoxication, a special place is occupied by mystic bacterial infection caused by opportunistic microorganisms of the genus *Candida* spp, *staphylococcus* spp. etc. At the same time, some members of the skin normobiota, for example, dandruff yeast fungi (*Malassezia* spp.), *Staphylococcus epidermidis* (*st.epidermidis*) and can be sources of allergens and the cause of exacerbation and/or complications of the disease.

Treatment with modern enterosorbents is of particular importance in the treatment of acute as well as chronic diseases accompanied by a syndrome of endogenous intoxication, the critical link of which is dysfunction of the microbiocenosis and intestinal barrier. The need to use enterosorbents remains more than relevant due to their effectiveness, safety and wide availability. [12,14,19]

In order to find new methods of endogenous intoxication, Uzbek scientists have developed a biological active additive based on mineral raw materials - glauconite "Fatifiltrum" according to an applied project together with the Russian National Research and Medical Center for Medical Sciences and Tashkent Pharmaceutical Institute of the Ministry of Health of the Republic of Uzbekistan.

Fatifiltrum - activated glauconite (mineral, hydrous aluminosilicate of iron, silica and potassium oxide of variable composition, belongs to the group of hydromica) - 300, 600 mg. Detoxifying agents, including antidotes, adsorbents, dietary supplements containing iron; Dietary supplements containing silicon. It has a general strengthening, immunocorrective, enterosorbing and detoxification effect. The uniqueness of glauconite lies in the fact that it can be used as a highly effective immunosorbent, characterized by binding and extraction of antibodies or antigens from the blood.

**The Purpose of the Research** was to develop a new method for treating endogenous intoxication in patients with atopic dermatitis based on activated glauconite.

## 2. Material and Research Methods

56 patients with atopic dermatitis (AD) aged from 14 to 41 years were observed. Among them, there were 25 males and 31 females. The control group consisted of 35 practically healthy individuals. All patients underwent clinical (SCORAD index determination), immunological, microbiological, and statistical studies. Clinical studies of the SCORAD index were determined using software diagnostics (Scoring of Atopic Dermatitis, 1993), which is calculated using the formula:

$SCORAD = A/5 + 7B/2 + C$ , where A is the prevalence of rashes, B is the intensity of inflammation of the pathological process (erythema, edema, crusts, excoriation, lichenification, dry skin), C is the severity of subjective symptoms (itching and sleep disturbance). As well as the clinical course, taking into account the duration of the disease, hereditary factors and seasonality of the disease. (DGU 17865; DGU 17814)

The level of total IgE and antimicrobial peptide LL-37 in blood serum was determined by enzyme-linked immunosorbent assay (ELISA) using commercial ELISA test systems "Vector-Best" (Novosibirsk). The degree of endogenous intoxication was assessed by studying the sorption capacity of erythrocytes (SCE) and the level of medium molecule peptides (MMP). The determination of the sorption capacity of erythrocytes was carried out using the method of Togaibaev A.A. and co-authors [18] and the level of peptides of medium molecules using the method of Gabrielyan N.I. and co-authors [5]. The research results were statistically processed using standard methods of variation statistics using Student's t-test using the Excel-Office-2010 application program on a Pentium IV computer.

## 3. Research Results

The results of microbiological studies of skin lesions in patients with AD revealed an increased contamination of opportunistic microflora of the Micrococcaceae family - staphylococcus spp. Among the staphylococcal flora, the highest contamination was *St. aureus*, *St. Epidermidis*, which was statistically significantly different from the indicators of control healthy individuals ( $P < 0.05$ ). The results of the study showed that in patients with atopic dermatitis in the blood serum there was a significant increase in the sorption capacity of erythrocytes compared to the control group and on average it was  $40.2 \pm 0.2\%$  versus  $26.46 \pm 0.61\%$  in the norm. ( $p < 0.001$ ). The level of medium molecule peptides also significantly increased by 2.1 times ( $0.416 \pm 0.005$  EU,  $p < 0.001$ ) compared to the control group ( $0.213 \pm 0.003$  EU). (Table 1)

The results obtained indicate that patients with atopic dermatitis experience endogenous intoxication of the body, characterized by an increase in the concentration of SSE and medium molecule peptides.

ELISA studies of antimicrobial peptides (AMPs) LL-37 in blood serum showed an increase in concentration in patients with blood pressure by 4.5 times compared with the indicators of the healthy control group and averaged  $8.1 \pm 0.2$  pg/ml ( $P < 0.05$ ). The average level of total IgE was  $160.4 \pm 18.3$  IU/ml, which was 2.5 times higher than in healthy individuals. ( $P < 0.05$ ).

Analysis of the results obtained indicates that patients with AD experience endogenous intoxication due to bacterial sensitization.

In further studies, we studied the effect of activated glauconite "Fatifiltrum" on the state of the degree of endogenous intoxication in patients with atopic dermatitis.

For this purpose, the patients were divided into two groups: the first group (traditional therapy) included 23 patients who made up the comparison group and received lactofiltrum (1 tablet 3 times a day) against the background of complex therapy and external treatment with topical anti-inflammatory drugs; The second group

(complex therapy) included 56 patients who made up the main group, who were prescribed the drug fatifiltrum as part of therapy. Fatifiltrum 0.3 g was prescribed for those over 12 years of age, 1 capsule 3 times, and for adults, 2 capsules 3 times a day before meals for 10 days.

The results of the study showed (Table 1) that after traditional therapy in patients with atopic dermatitis in the blood, SCE indicators decreased compared to the data before treatment and were significant (  $P < 0.05$ ), on average it was  $33.7 \pm 0.27\%$  versus  $39.31 \pm 0.47\%$  before treatment, however, it remained higher than the data from the healthy control group ( $29.08 \pm 0.88\%$ ). A study of the effect of traditional therapy using lactofiltrum on the content of medium molecule peptides in the blood serum indicates that in patients with atopic dermatitis, after treatment, the level of MMP decreased by 1.3 times ( $p > 0.05$ ), and did not reach the control level.

Table 1. Comparative analysis of the effect of therapy on indicators of endogenous intoxication in patients with atopic dermatitis ( $M \pm m$ )

Treatment method	Количество обследованных лиц	Research	SCE (%)	MMP (EE)
Traditional (lactofiltrum)	23	before treatment	$39,31 \pm 0,47$	$0,363 \pm 0,004$
		after treatment	$33,7 \pm 0,27$	$0,28 \pm 0,005$
innovative (fatifiltrum)	56	before treatment	$40,2 \pm 0,2$	$0,416 \pm 0,005$
		after treatment	$28,8 \pm 0,3^*$	$0,201 \pm 0,003^*$
control group	36		$29,08 \pm 0,88$	$0,218 \pm 0,005$

Note: p – reliability of data after treatment in relation to indicators before treatment \* –  $p < 0.01$ ;

In the group of patients with AD who received activated glauconite, the SSE indicators and the level of SMP in the blood are statistically significantly reduced compared to the data before treatment ( $p < 0.05$ ) and on average they were  $28.8 \pm 0.2\%$  and  $0.201 \pm 0.003$  EE, respectively at  $40.2 \pm 0.2\%$  and  $0.416 \pm 0.005$  EU, respectively, before treatment.

Thus, the use of the drug fatifiltrum in the complex therapy of patients with atopic dermatitis helps to significantly reduce the degree of endogenous intoxication of the body than traditional therapy.

Distinctive features were noted in the performance of antimicrobial peptides LL-37 during therapy in patients with AD. Thus, in the group of patients receiving traditional therapy, the level of AMP LL-37 decreased by 2.9 times and averaged  $3.06 \pm 0.04$  pg/ml (versus  $8.6 \pm 0.8$  pg/ml before treatment), whereas in patients with AD who received activated glauconite, the level of AMPs decreased by 3.9 times and averaged  $2.04 \pm 0.17$  pg/ml ( $P < 0.05$ ).

The SCORAD index in the group of patients with blood pressure who received an innovative method of treatment decreased by 4.04 times and averaged  $17.5 \pm 0.6$  (before treatment  $70.7 \pm 1.9$ ), while in the group of patients with blood pressure who received traditional therapy with lactofiltrum, the index decreased by 3.02 times and averaged  $24.6 \pm 0.5$  (before treatment  $74.4 \pm 1.2$ ), respectively. ( $P < 0.05$ )

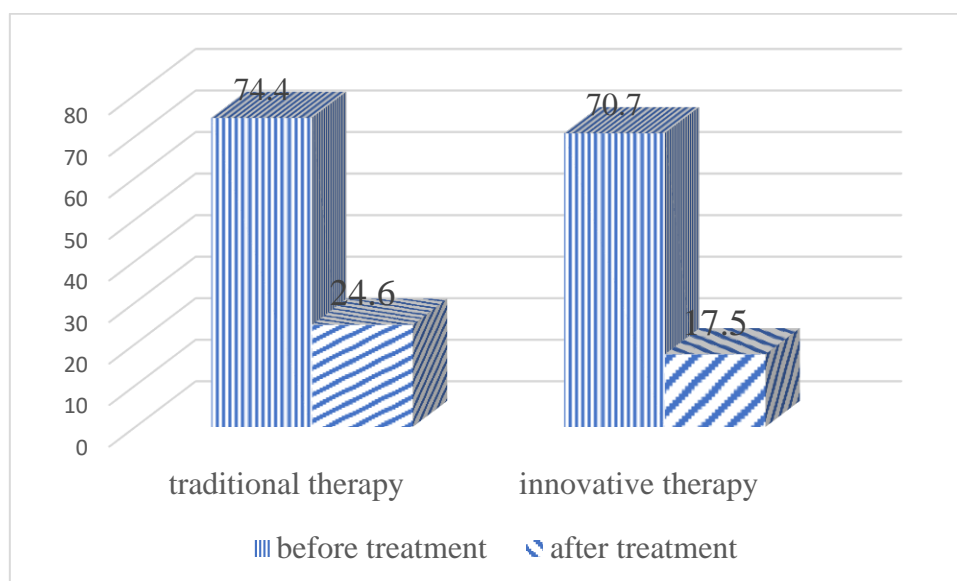


Fig.1. Comparative characteristics of the SCORAD index against the background of therapy (abs)

Thus, our data indicate that endogenous intoxication of the body is detected in patients with atopic dermatitis. The use of the drug activated glauconite (fatifiltrum) in the complex therapy of patients with atopic dermatitis helps to significantly reduce the degree of endogenous intoxication of the body, which can be recommended in practical dermatology.

#### 4. Conclusion

The use of activated glauconite (fatifiltrum) in complex therapy in patients with atopic dermatitis contributes to a more significant reduction in the degree of endogenous intoxication of the body, the SCORAD index by 4.04 times, than standard therapy. The data obtained indicate the detoxifying ability of activated glauconite “fatifiltrum”, which can be recommended for widespread use in dermatological practice.

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