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Assessment of the Dermatological Index of the Scale of Symptoms in Patients with Allergic Dermatoses with Opportunistic Infection based on the use of Natural Silicon Oxide

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ABSTRACT

The article presents the results of external treatment of allergic dermatoses using the moisturizing, toning, anti-inflammatory cream "Fatiderm". Clinical studies have shown that Fatiderm cream helps to reduce the severity of the dermatological scale of symptoms, eliminate subjective sensations, and improve the dynamics of the skin-pathological process.

KEY WORDS: allergodermatosis, external treatment, “fatiderm”crem

INTRODUCTION

In dermatological practice, allergic skin diseases with chronic, often recurrent and resistant forms of the clinical course are increasingly recorded. [1,2,8,10] The etiopathogenesis of these allergic skin diseases is based on the role of opportunistic infections caused by staphylococcus spp., Candida spp. and infections caused by Herpes simplex virus. [3,4,8,9,10,17,] According to studies, peptidoglycan of the cell wall of St. aureus, when colonized by this microorganism of the skin of patients with atopic dermatitis, induces the production of keratinocytes in the lesions of inflammatory mediators and cytokines, including GM-CSF. At the same time, dysfunction of the specific tollpod receptor, TLR2, can cause staphylococcal persistence in patients with allergic dermatoses as a result of impaired induction of antimicrobial peptides, as exemplified by beta defensin 2. [18]

According to Gintsburg A.L., Ilyina T.S. et al. (2003) in the metabolic processes of microorganisms and their ability to form biofilms, great importance is attached to microelements. [6] Iron is an important trace element that is part of respiratory enzymes and helps accelerate oxidative processes. Also, for the implementation of respiration processes and the activation of enzyme systems, microorganisms need copper, potassium and magnesium. According to N. Kaletin (2007), the concentration of magnesium ions in the cell affects the energy production processes that occur in the mitochondria of microorganisms. [7]

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The qualitative and quantitative composition of trace elements can be associated with metabolic processes occurring in microbial cells and affect the degree of virulence of these pathogens. [thirteen]

Studies have shown that chelating proteins play in the fight against infectious agents, one of which is calprotectin, which is contained in neutrophils. In inflammatory processes, there is a large release of neutrophils into the area of inflammation, which creates an anti-inflammatory effect. Also, it was found that calprotectin binds zinc, manganese and iron, calcium, thereby suppressing the spread of bacteria, also opportunistic fungi.

One of the ways to suppress the growth of opportunistic microorganisms is the activation of chelating proteins in neutrophils - calprotectin during illness, which will help to increase the function of the body's immune system in the fight against the pathogen.

At the present stage in dermatological practice, the search for new possibilities in the therapy of especially external action of allergic skin diseases is an urgent and demanded problem. Since in recent years, there has been a steady increase in allergic dermatoses among skin diseases, which, according to the latest data, make up 73.7%. Chronization, frequent relapse, and resistance to basic therapy poses a number of serious problems for clinicians and pharmacists in terms of developing new therapies.

It should be noted. that in the development of allergic diseases the decisive role belongs to the condition - the skin, i.e. epidermal barrier. In this case, irritants and allergens will primarily come into contact with human skin, through which, thanks to peptidoglycans of opportunistic microorganisms, they will contribute to the formation of inflammatory processes in the human body. [3]

Modern dermatology has in its arsenal a variety of drugs in nature and purpose for the treatment and prevention of allergic and pyoinflammatory diseases of the skin and mucous membranes. It should be said that the need for highly effective, affordable domestic medicines is not fully satisfied. The most commonly used anti-inflammatory drugs for the treatment of this pathology, namely topical corticosteroids and other synthetic chemotherapy drugs, not only cause drug resistance, but also are fraught with the development of complications, which contributes to the persistent course of dermatoses. [9,10,11]

External therapy in dermatological practice is the leading link in therapeutic measures. External agents are evaluated not only by their local actions on the pathological process, but also they have a reflex effect on the central and autonomic nervous system and metabolism, influencing through nerve receptors. The importance of using external agents for uncomplicated forms of skin diseases is attributed to the elimination of symptoms, in some cases they have a direct etiological

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effect, while not inferior in the effectiveness of systemic therapy.

Despite the large arsenal of external medicines used in dermatological practice, the problem of external therapy in the treatment of allergic skin diseases is still relevant. [16,17,18,20]

In the course of fundamental research, the geochemical characteristics of siliceous solutions were assessed and their anti-inflammatory and antibacterial were studied by experimental research, which contributed to the development of new medicinal products for dermatological practice. [2]

Within the framework of the applied grant PZ-20170922154 "Development of new drugs for external therapy for allergic dermatoses, prepared on the basis of natural raw materials of Uzbekistan" with the support of Fatilyuks LLC, a new domestic therapeutic and cosmetic drug for external action "Fatiderm" was developed, which has a moisturizing, tonic and regenerating action.

The aim of our research was to evaluate the therapeutic efficacy of Fatiderm moisturizing cream in patients with allergic dermatoses.

MATERIALSANDMETHODS

The study involved 39 patients with allergic dermatoses at the age from 9 to 48 years. Among them there were 24 males and 25 females. According to the nosological form, 19 were diagnosed with atopic dermatitis, 12 with allerodermatitis and 8 with pruritus. All patients underwent clinical (determination of the DISS index), microbiological and pathomorphological studies before and after treatment.

All patients underwent clinical and microbiological studies. Also, the patients were consulted by related specialists (endocrinologist, therapist, ophthalmologist, neuropathologist, gastroenterologist, allergist). The clinical study consisted in determining the dermatological index of the symptom scale (DISS), which was assessed according to the following parameters: erythema, edema, oozing, lichenification, papules, dryness (xerosis), desquamation, erosion, itching. The parameters were evaluated on a 3-point system, except for pruritus (4 points). At the same time, the indicators of the DISHS index were assessed according to the following criteria: with a decrease in the indicators of the DISHS index by 95%, it characterized clinical remission, 75-95% - a significant improvement, 50-75% - an improvement, 25-50% - a slight improvement.

Microbiological studies of the skin consisted of bacterial sowing of skin scales of lesions. For bacteriological studies, 5% blood agar, Endo, Levin's medium and saline mannitol agar were used. The culture was incubated in a thermostat at a temperature of 36.80C. Bacterial culture was performed on the skin of healthy control individuals (34) and in patients of the main group (39).

All patients, according to the standard and clinical protocol for the treatment of skin diseases, underwent basic therapy, consisting in the appointment of detoxification, hyposensitizing,

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antihistamine therapy, vitamin therapy and external therapy (the main group received Fatiderm cream (n = 22) and the control group (n = 17) - bepanten cream).

Fatiderm cream is an external preparation of domestic production of Fatilyuks LLC, which has a unique composition: lanolin, high-quality olive oil and activated siliceous solutions. Fatiderm cream was applied to the lesions twice a day for 10 days.

When prescribing a new cream, we used the following research criteria:

1. The patient's age is 12-65 years old.
2. Mild and moderate severity of the skin process.
3. Use by patients during the last 3 months of external therapy in the form of indifferent ointments and creams (without glucocorticosteroids)
4. Availability of voluntary informed consent of patients.

The exclusion criteria from the study were:

1. Taking systemic glucocorticosteroids for 16-30 days prior to enrollment in the study.
2. External use of steroid therapy in the last 1-2 months before the visit.
3. pregnant and lactating women.
4. Alcohol, drug or drug addiction
5. Failure to comply with the requirements of the staff and the researcher.

Statistical processing of the research results was carried out on the basis of the method of confidence intervals. To calculate the accuracy of estimating the interval of values of a random variable, the Student's and Laplace-Gauss distributions were used. In the case of a small number of patients (n = 6), the Student's distribution was used with the number of degrees of freedom v = 2 (n-1) = 10.

RESULTS AND DISCUSSION

The clinical assessment of external therapy was assessed by the state of the general status, skin-pathological process and data from microbiological and pathomorphological studies. The main criteria, as a consequence, the effectiveness of therapy were: the onset of complete or incomplete clinical remission of the skin pathological process, a decrease in the DISHS index, microbiological negativity in the lesion focus of the skin pathological process, the frequency of relapses.

Thus, the results of the study showed that in the I - group of patients who received external therapy with the use of Fatiderm cream, the dynamics of the resorption of the skin-pathological process was noted significantly compared with the indicators of the II - group. (Table 1).

All patients underwent clinical (DISS), microbiological and histological studies before and after pathogenetic external therapy. (Table 1)

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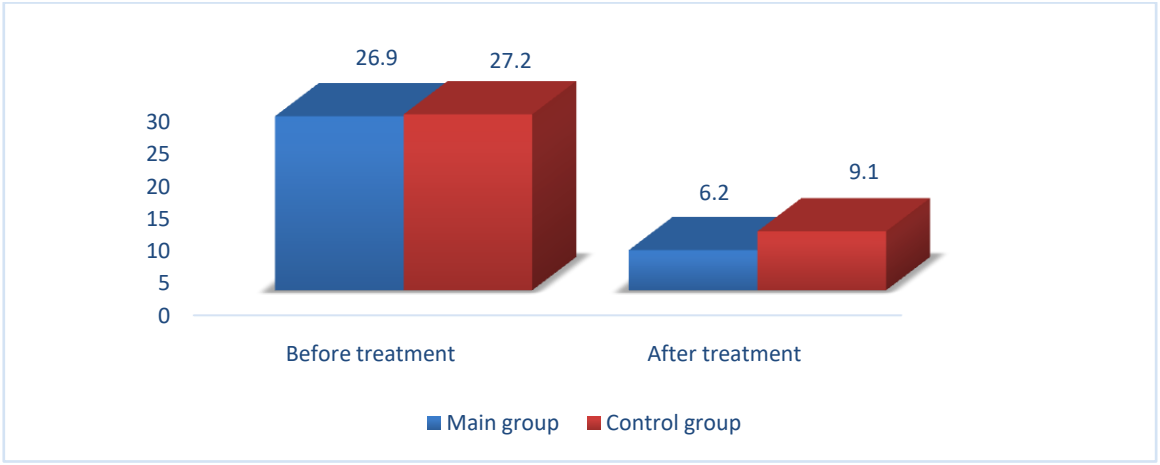
Fig. 1. Comparative characteristics of the DISS index against the background of external therapy (scores) (P <0.05)



The results of the study showed that the severity of DISS in patients of group I averaged 26.9 +0.1 points, while in patients of group II - an average of 27.1 + 0.1 points. Whereas in patients of group I, against the background of using fatiderma cream, the DISS index decreased by 4.3 times and averaged 6.2 + 0.1 points, while in group II, the DISS index decreased by 2.9 times and amounted to average 9.1 + 0.1 points. (P <0.05).

Table 1. Comparative assessment of DISS against the background of external therapy in patients with allergic dermatoses (scores)

DermatologicalSymptomScaleIndex									
Groups	**Erythema**	**Edema**	**Wetness**	**Lichenification**	**Papules**	**Dryness**	**Peeling**	**Erosion**	**Itching**
Before treatment with fatiderm n-22	3,2±0,1	2,5±0,1	1,7±0,3	2,8±0,2	3,2±0,16	3,5±0,1	2,6±0,1	3,6±0,1	3,8±0,07
After the treatment n = 22	1,04±0,07*	0,4±0,1*	0,8±0,1	0,6±0,1*	0,7±0,09*	0,7±0,1	0,7*±0,1	0,75±009	0,5±0,1*
Control group n = 17 Before treatment	3,1±0,2	3,1±0,2	1,9±0,2	3,4±0,14	3,05±0,3	3,6±0,1	3,0±0,2	2,3±0,1	3,7±0,1

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Control group n = 17 After treatment	0,8±0,1*	1,2±0,1*	1,0±0,1	1,2±0,09*	1,5±0,1*	0,8±0,1	0,7*±0,1	0,7±0,1	1,2±0,15*

Note: * - P <0.05 reliability in relation to before treatment.

As can be seen from the table, the dynamics of the skin-pathological process against the background of the use of Fatiderm cream noticeably changed for the positive side: among the clinical symptoms, a significant decrease in erythema by 67.5 times was noted, a decrease in edema - by 84% (P <0.05), peeling - by 73.5%, resorption of lichenification and papular elements by 78.6% (P <0.05). Against the background of resorption of the skin pathological process, a significant decrease in subjective sensations - itching by 86.8% was noted, which was 0.5 + 0.1. (P <0.05).

A comparative clinical analysis of external therapy in patients with eczema who received bepanten also showed identical positive efficacy of the drug. However, the intensity of subjective sensations decreased by 67.6% and amounted to 1.2 + 0.15 points (P <0.05).

The results of the study of DISS in patients with allergic dermatoses, who received Fatiderm cream in external therapy, showed positive dynamics of the clinical course of the skin-pathological process, which actually did not differ from the comparative control group.

Thus, the preliminary results of a clinical study show the presence of anti-inflammatory, antipruritic properties of Fatiderm cream.

The results of experimental studies of activated siliceous solutions showed that due to the rich composition of these solutions - minerals and trace elements, which are the constituent components of Fatiderm cream, we were interested in assessing antimicrobial properties. Thus, microbiological studies of the skin of lesions in patients with allergic dermatoses showed an increased growth of opportunistic microorganisms - staphylococcus spp. in an average amount from 1132 to 2803 CFU per 1 cm. Moreover, among the staphylococcal flora, St.aureus with genotypes of methicillene-resistant genotypes was most often sown - MRSA in 33.3% of cases, which characterized the persistent form of staphylococcal infection in patients with allergic dermatoses.

The use of Fatiderm cream helped to reduce the degree of colonization of staphylococci to an average of 87 - 112 CFU. Analysis of the results of microbiological studies indicates the overwhelming property of the growth of staphylococcal flora. It should be noted that during the use of Fatiderm cream, not a single patient had significant side effects that required discontinuation of the course of the drug or special treatment.

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Pathomorphological studies of the skin of biopsy specimens of lesions in patients with atopic dermatitis before treatment showed the phenomenon of hyperkeratosis, detachment of the stratum corneum, spongiosis, thickening of the granular layer, uneven acanthosis with elongated epidermal processes, intercellular edema of cells of the spinous layer and vacuolization of cells of the basal layer. In the papillary layer of the dermis, edema, vasodilation, around them lymphohistiocytic infiltration with the content of neutrophils, eosinophils and the penetration of infiltrate cells into the epidermis. Saturation of the stratum corneum with serous fluid, inter- and intracellular edema of the cells of the prickly layer with the formation of intraepidermal blisters.

Whereas in patients with atopic dermatitis after treatment in skin biopsy specimens in all preparations showed slight hyperkeratosis, in places smoothness of epidermal processes, granular layer without features. There was a decrease in the intercellular edema of the cells of the thorny layer of the epidermis. There is slight edema in the basal layer. In the upper and middle third of the dermis, the vessels are dilated, single lymphohistiocytic infiltrates with neutrophil content, collagen fibers without features are determined around them.

Thus, clinical and morphological studies have shown that Fatiderm cream has anti-inflammatory, regenerating, moisturizing properties, which can be recommended for widespread use as an external therapy in patients with allergic dermatoses.

CONCLUSION

1. The use of a domestic preparation for external use of the cream "Fatiderm" for allergic dermatoses is effective in view of its anti-inflammatory effect.
2. Cream "Fatiderm" has a bacteriostatic effect on conditionally pathogenic flora of the skin of lesions.
3. Due to its unique composition, Fatiderm cream is recommended for widespread use in the treatment of dry skin, allergic dermatoses.

REFERENCES

1. Arifov S.S., Abdurashidov A.A., Ganiyeva SH.T. Strategiyaterapiiatopicheskogodermatita. // Dermatovenerologiyaiesteticheskayameditsina. Nauchno-prakticheskiyzhurnal. -№3/2018 (39) – s.21.
2. BakiyevS.A,.Mavlyanova SH.Z., Ibragimov A.S., Mavlyanov P.N. Osobennostilechebnykhsvoystvkremniysoderzhashchikhmineral'nykhvodUzbekistana.// Geologiyaimineral'nyyeresursy.-Nauchno-prakticheskiyzhurnal №1-2019 g. – s. 43-45
3. Bukharin O.V. Persistentsiyabakterial'nykhpatogenovkakfiziologicheskiyfenomen. //

VestnikMosk.Un-ta. – ser.16. Biologiya – 2008. №1. –s. 6-13.

4. Dmitrenko O.A., Prokhorov A.YA, Fluyer F.S. i dr. Opredeleniyegenovpirogennykhtoksinovsuperantigenov u klinicheskikhizolyatovmetitsillinrezistentnykh Staphylococcus aureus. // Zhurnmikrobiol 2006; 2: 36—42.
5. Yershova A.K. O primeneniipreparatabetadin v khirurgicheskoypraktike. Rus med zhurn 2011; 16: 999—1001.
6. Gintsburg, T. S. Il'ina, YU. M. Romanova // Zhurnalmikrobiologii, epidemiologiiiimmunobiologii. – 2003. – № 5. – S. 86–93.
7. Kaletina N. Mikroelementy – biologicheskiyeregulyatory. / N.Kaletina, G.Kaletin// Nauka v Rossii. – 2007 -.-№1.-s.50-57
8. Kalyuzhnaya L.D. Preodoleniyebakterial'nogoigribkovogooslozheneniyapriatopicheskomdermatite.// Ukrainskiyzhurnaldermatologii, venerologii, kosmetologii. 2007.№7. s. 1-4.
9. Kudryavtseva A.V., Fluyer F.S., Maksimushkin A.YU. Vozmozhnostieradikatsiizolotistogostafilokokkaprioslozhnennomatopicheskomdermatite u detey// Rossiyskiyvestnikperinatologiiipediatrii 2012 №6 – s. 32 – 36
10. Kudryavtseva A.V., Fluyer F.S., Balabolkin I.I. i dr. Zavisimost' tyazhestitecheniyaatopicheskogodermatita u deteyottoksinprodutsiruyushchikhsvoystvshtammovzolotistogostafilokokka. Rospediatzhurn 2009; 3: 31—37.
11. Kungurov N.V., Keniksfest YU.V., Kokhan M.M. i dr. Kombinirovannayanaruzhnayaterapiyaoslozhnennykhdermatozov // Klinicheskayadermatologiyaivenerologiya. 2005.-№2.-s.33-37.
12. Korotkiy N.G., Tikhomirov A.A., Gamayunov B.N. Primeneniyeantibakterial'nykhiprotivogribkovykhsredstv v naruzhnoyterapiidetey s atopicheskimdermatitomrazlichnoystepenityazhesti, oslozhnonnymvtorichnoyinfektsiyey. Pediatfarmakol 2007; 2: 76—80.
13. KochnevaYe.V. Opredeleniyevliyaniyakolichestvennogosoderzhaniyamikroelementov v kletkakh staphylococcus aureus naikhsposobnost' k formirovaniyubioplenok. // Arkhivarius . – 2015 – s.127-130
14. MatushevskayaYe.V., Svirshevskaya V.S. Topicheskiyeglyukokortikosteroidy v dermatologii.// Metodicheskiyerekomendatsii . Moskva. 2008. 36 s.
15. Pliyev B.K. Khemotakticheskiaktivnyyebelkineytrofilov.// Biokhimiya, 2008, tom 73, vyp. 9, s.

1206 - 1223

16. Rakhmatov A.B., Mavlyanova SH.Z. Atopicheskiydermatit: diagnostikailecheniye. // Metodicheskiyerekomendatsiidlyavrachey. – Tashkent. -2006 – 16s.
17. Romanenko I.M., Kulaga V.V., Afonin S.L. Lecheniyekozhnykhivenericheskikhbolezney. // Rukovodstvodlyavrachey: v 2t. – M.:OOO «Meditsinskoyeinformatsionnoyeagenstvo». 2006 – T.1 – 904 s.
18. Sergeyev YU.V. Triderm: taktikaterapiivospalitel'nykhdermatozov, obuslovlennykhgribkovoyismeshannoyinfektsiyey/Pod re. YU.V.Sergeyeva./M.Meditsinadlyavsekh, 2005.-s.24.
19. SorokinaYe.V. Toll – podobnyyeretseptoryipervichnoyeraspoznavaniyepatogenapridermatozakhinfektsionnoyineinfektsionnoyetiologii. // Immunologiya, allergologiya, infektologiya. – 2012.- №2: 6-15. – s.6-15
20. Batchelor J.M., Grindlay D.J., Williams H.C. What's new in atopic eczema? An analysis of systematic reviews published in 2008 and 2009. ClinExpDermatol 2010; 35: 8: 823—827.