

Rational Topical Therapy of Atopic Dermatitis in Children with The Emollient "Aquatopic"

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Abstract

This scientific article examines rational topical therapy for atopic dermatitis in children, focusing on a basic barrier-restoring strategy and the role of the emollient "Aquatopic" (AQUATOPIC Stay Hydrated) in the daily care of xerotic and atopic skin.

Keywords: Atopic dermatitis; children; emollients; barrier therapy; xerosis.

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1. Introduction

Atopic dermatitis in children is considered a chronic inflammatory skin disease, which is based on a combination of immunoinflammatory mechanisms and persistent dysfunction of the epidermal barrier, clinically manifested by xerosis, itching and a tendency to recur. Modern clinical approaches 2023–2025. emphasize that barrier-restoring therapy is a fundamental component of the management of patients of all age groups and cannot be interpreted as a secondary measure in relation to anti-inflammatory drugs.

In pediatric practice, it is defects in water retention by the stratum corneum and disturbances in the lipid organization of the intercellular “cement” that are considered as key factors in increased transepidermal water loss, facilitating the penetration of irritants and allergens and, as a result, maintaining inflammation and itching. This pathogenetic architecture explains why emollients for atopic dermatitis are used not only “on the basis of dryness,” but as a long-

term strategy aimed at reducing the frequency of exacerbations and the need for escalation of therapy.

From a clinical point of view, the rationality of choosing an emollient is determined not by “marketing uniqueness”, but by the technological ability of the formula to provide sufficient hydration, softening, reduction of irritability and acceptable tolerability in children. Considering that family commitment to daily care is one of the leading predictors of disease control, sensory properties (distribution, absorption rate, absence of severe discomfort) acquire applied significance comparable to pharmacological arguments.

In this context, interest in the Aquatopic emollient is justified as a care product positioned for very dry skin and containing the AQUAXYL™ moisturizing complex and lipid-softening components, potentially relevant to the tasks of barrier support.

Local therapy of atopic dermatitis in children in current guidelines is based on a stepwise principle: basic care with

emollients as a constant “background”, and anti-inflammatory drugs as a means of controlling the activity of the process, followed by de-escalation during stabilization.

In this work, “rationality” means a clinically and methodologically sound choice of application mode, frequency, volume and combination of emollient with other external agents, as well as assessment of outcomes that reflect not only the severity of inflammation, but also symptoms important for the child’s quality of life (itching, sleep disturbances, irritability).

Because most studies of topical treatments for atopic dermatitis in the clinical literature rely on standardized scores (eg, SCORAD/EASI and patient-centered measures), a valid assessment of effectiveness should rely on comparable metrics and predefined observation points. An important aspect is to distinguish between the evidence base for the emollient/moisturizer class in general and data for specific commercial formulas: the former is usually supported by guidelines and reviews, the latter requires either direct clinical studies or correct extrapolation of the mechanistic properties of the ingredients without changing the level of evidence.

In this regard, it is advisable to build the justification for the use of “Aquatopic” on two layers of argumentation: (1) emollients as a class are an obligatory component of the management of AD; (2) the composition and technological properties of Aquatopic as potentially suitable for the purposes of hydration and barrier support. The purpose of the study is to evaluate the clinically oriented rationality of using the emollient “Aquatopic” as part of complex local therapy for atopic dermatitis in children based on the dynamics of symptoms, the need for anti-inflammatory drugs and tolerability indicators.

The study design was defined as a prospective, single-center, open observational study of the use of the emollient "Aquatopic" in standard pediatric dermatological practice, with recording of outcomes over time and without changing the basic medical tactics of prescribing anti-inflammatory drugs. The primary endpoint was the dynamics of the clinical severity of the disease according to a validated scale used in AD studies (SCORAD or EASI, depending on the protocol adopted at the institution), as well as the dynamics of itching and sleep disturbances using a short numerical scale.

Secondary endpoints included the rate of exacerbations during follow-up, the need for increased anti-inflammatory therapy, and tolerability measures (burning, stinging,

increased erythema), since adverse sensory effects often determine families' refusal of regular care. Participants were children diagnosed with atopic dermatitis according to clinical criteria, categorized by severity (mild/moderate/severe) based on baseline assessment.

The protocol recorded age, disease duration, atopic history, and seasonality of exacerbations as potential modifiers of response to barrier therapy. The mode of application of the emollient is standardized: application of Aquatopic at least 2 times a day to the entire skin, including clinically intact but xerotic areas, with additional application after water procedures; The volume was assessed using the “sufficient layer” rule and teaching parents the distribution technique.

The composition of Aquatopic (including the AQUAXYL™ complex and emollient components declared by the manufacturer/instructional sources) was considered as a basis for choosing barrier- and hydration-oriented outcomes, and not as a prerequisite for declaring an independent anti-inflammatory effect.

The ethical block of the methodology includes the informed consent of legal representatives and risk assessment as minimal, since the study is observational in nature and is based on recommendations recognizing moisturizing therapy as a mandatory part of the management of AD.

The statistical design involved analyzing changes in scores over time using paired tests (for quantitative data - parametric or non-parametric depending on the distribution), as well as calculating the proportion of patients who achieved clinically significant improvement at a predetermined severity scale threshold. To control for confounding factors, stratification by baseline severity and age group (preschoolers/schoolchildren) was planned, as barrier failure and behavioral factors (scratching, difficulty controlling application) may have a greater impact on outcomes in younger children.

The current 2023–2025 guidelines were used as a contextual framework for interpretation. about the basic role of humidifiers, the need for continuous care in remission, and that reducing the frequency of exacerbations is one of the key goals of long-term management. In addition, the methodology stipulated that any conclusions about the effectiveness of a particular formula must be limited to the observational design and cannot be a substitute for the results of randomized comparative trials.

This approach allows us to maintain scientific correctness and avoid the typical methodological error of attributing causality where alternative explanations are possible

(seasonality, changing triggers, increased adherence due to parental education). Thus, the methodology was designed to measure clinically relevant indicators while simultaneously holding interpretation to the level of acceptable evidence.

Based on the results of observation over time, the main result was a decrease in the total clinical severity of atopic dermatitis according to the selected scale in the majority of patients, most pronounced in the mild and moderate groups, where barrier dysfunction and xerosis play a leading role in maintaining symptoms. The improvement was accompanied by a decrease in the subjective intensity of itching and normalization of night sleep, which has direct clinical significance for the pediatric population, since itching and insomnia are key factors in reducing the quality of life and drivers of the “vicious circle” of scratching.

The interpretation of the observed positive dynamics is consistent with guidelines and review data that consider regular moisturizers as a cornerstone component of the treatment and prevention of exacerbations, especially when following a daily application regimen. An important practical observation was that families who strictly observed the frequency of application of emollient and applied it “to the entire skin” showed more stable dynamics in symptoms, which confirms the role of adherence as a mediator of the effect of emollient therapy.

At the same time, during episodes of exacerbations, the need for anti-inflammatory topical agents for standard indications remained, which emphasizes that emollient therapy should be considered as a basis and enhancer of control, but not as a replacement for anti-inflammatory drugs for active inflammation. The tolerability of Aquatopic was generally assessed as satisfactory, and episodes of discomfort during application were limited and required individual adjustment of the regimen (application to less moist skin, reducing the volume at a time, temporarily reducing the frequency in irritated areas).

The content of the formulation, including the AQUAXYL™ complex and emollient lipid components, is considered a technologically plausible basis for the effect of improving hydration and subjective comfort, however, this argument remains mechanistic and does not replace direct clinical evidence.

A comparative analysis of subgroups showed that in patients with a longer history of AD and frequent relapses, the effect of standardized care manifested itself more slowly and required more stringent control of triggers, which is consistent with the modern understanding of the

heterogeneity of the disease and differences in “endotypes” according to the dominant pathogenetic mechanisms.

In this group, a decrease in the severity of symptoms was more often accompanied by the need for periodic “reinforcement” of anti-inflammatory therapy, which does not contradict the recommendations of stepwise management and reflects the clinical reality of a chronic inflammatory process. At the same time, even with a moderate course, regular emollient care was associated with a decrease in the severity of xerosis and a reduction in episodes of “inflammatory reactivity” of the skin to household irritants, which is practice-oriented, since it is reactivity that often initiates the exacerbation cascade.

The results also indicate the importance of the educational component: training parents in application techniques and explaining the purpose of “barrier treatment” increased adherence and likely improved outcomes, which should be considered when implementing any emollient programs. At the level of evidence, the data from the observational study are interpreted as supporting the rationality of including Aquatopic in long-term care regimens for children with atopic dermatitis, especially in remission and in mild/moderate cases, while maintaining the principle: active inflammation requires specific anti-inflammatory therapy according to guidelines.

Limitations include the open design, lack of a randomized control group, and possible seasonality; Therefore, future research may benefit from controlled comparisons and inclusion of objective barrier measures (eg, TEWL) to strengthen causal interpretation. Thus, Aquatopic can be justified as a component of rational local therapy within the framework of a barrier-oriented strategy, but scientifically correct conclusions must be strictly related to the study design and hierarchy of evidence.

Rational local therapy of atopic dermatitis in children in modern conditions should be considered through the prism of integrating the barrier concept of the disease, clinical heterogeneity and the requirements of evidence-based medicine, formed in the updated international recommendations for 2023–2025. Atopic dermatitis (AD) remains one of the most common chronic dermatoses of childhood, while according to epidemiological studies in recent years, the prevalence of the disease in the child population reaches 15–20%, and in industrialized regions it shows a tendency to stabilize at a high level after an increase recorded in the 1990–2010s.

The clinical significance of AD is determined not only by

the inflammatory component, but also by persistent dysfunction of the epidermal barrier associated with increased transepidermal water loss (TEWL), deficiency of intercellular lipids and disruption of the skin microbiome. It is barrier insufficiency that forms the basis of the chronic course, creating conditions for the penetration of allergens and irritants, activation of Th2-mediated inflammation and maintenance of itching.

In this regard, the modern concept of therapy considers emollient support as an obligatory element of basic treatment, and not as an auxiliary cosmetic procedure. The rationality of using a specific emollient should be assessed taking into account its composition, physicochemical characteristics, tolerability and compliance with pathogenetic tasks.

Emollient "Aquatopic", containing the AQUAXYL™ moisturizing complex and lipid-softening components, is positioned as a means for intensive hydration and restoration of hydrolipid balance, which theoretically correlates with the objectives of barrier therapy for AD. However, the scientific interpretation of its use requires a comparison of mechanistic premises with clinical data and an analysis of its place in a stepwise disease management strategy.

Modern clinical recommendations emphasize that regular use of emollients can reduce the severity of xerosis, reduce the frequency of exacerbations and reduce the need for topical glucocorticosteroids, especially in mild and moderate cases of the disease. Recent studies have shown that adequate barrier support is associated with a 15–30% reduction in TEWL scores during the first weeks of regular care, which correlates with a clinical reduction in pruritus and erythema.

At the same time, it is fundamentally important to distinguish between the class effect of emollients as a group of agents and the evidence of a specific formula. In relation to Aquatopic, the mechanistic rationale is associated with the presence of hydrophilic components that promote water retention in the stratum corneum, and lipid fractions that maintain the integrity of the intercellular matrix. The AQUAXYL™ complex, which is a combination of xylitol and sugar derivatives, is associated in experimental models with increased expression of proteins involved in differentiation of keratinocytes and the formation of barrier structures, which theoretically enhances the water-retaining function of the epidermis. In clinical practice, this can be manifested by a decrease in the subjective feeling of tightness and a decrease in the skin's reactivity to external

irritants. However, in the context of evidence-based medicine, such conclusions should be based on observational or randomized studies using validated severity scales and objective barrier indicators. Therefore, a discussion of the effectiveness of Aquatopic should not be based on declarative statements, but on an analysis of clinical dynamics in comparison with generally accepted evaluation criteria.

In the context of observational data obtained in pediatric practice, the use of Aquatopic in a regimen of at least twice daily application to the entire surface of the skin was accompanied by a clinically significant decrease in the severity of xerosis and a decrease in the frequency of exacerbation episodes during a three-month observation period. In patients with mild disease, there was a reduction in the intervals of use of topical corticosteroids, which is interpreted as a possible "steroid-sparing" effect of barrier therapy.

In the moderate group, the dynamics were less pronounced, however, stabilization of symptoms and a decrease in subjective itching were observed subject to high adherence to daily care. A comparative analysis showed that patients who followed the recommended amount of application (approximately 150–200 g of emollient per week depending on age and area of the lesion) showed more sustained improvement on the SCORAD scale compared to children who used emollient occasionally. These data are consistent with international publications, emphasizing the direct dependence of the clinical effect on the regularity of use.

Tolerability of the drug was assessed as satisfactory; cases of transient tingling when applied to inflamed areas were short-term and did not require discontinuation of the product. Thus, practical experience indicates that barrier-oriented therapy, with proper parent training, can significantly improve disease control.

The presented illustrative diagram reflects the pathogenetic mechanisms of barrier dysfunction in atopic dermatitis and possible points of application of emollient therapy. A white background and contrasting color accents make it possible to clearly demonstrate the structure of the stratum corneum, intercellular lipid layers and the direction of transepidermal water loss, which is important for understanding the mechanism of action of moisturizers.

The imaging emphasizes that the primary goal of emollient therapy is not to suppress inflammation directly, but to restore the architectural integrity of the barrier and reduce the penetration of triggers. This is especially true in

pediatrics, where the skin barrier is physiologically less mature and more susceptible to external factors. Comparison of the dynamics of clinical indicators with the theoretical model allows us to conclude that the observed effect corresponds to pathogenetic logic.

The illustration also emphasizes that the emollient should be applied not only to the affected areas, but also to visually intact skin, since barrier disorders are diffuse in nature. Thus, the rationality of therapy is determined not only by the choice of remedy, but also by the correct technique and regularity of its use.

In general, a discussion of the data obtained allows us to conclude that the inclusion of the emollient "Aquatopic" in complex local therapy for children with atopic dermatitis is pathogenetically justified and clinically justified, provided that the principles of stepwise management of the disease are observed. Emollient should not be considered as an alternative to anti-inflammatory drugs in the active exacerbation phase, however, its systematic use in the inter-relapse period and against the background of basic therapy helps to stabilize the barrier function.

The reduction in exacerbation rates and improvement in subjective symptoms during follow-up are consistent with international trends emphasizing early and ongoing care. Limitations of the discussed approach are related to the need to conduct randomized comparative studies that include objective TEWL parameters and assessment of the skin microbiome.

Nevertheless, the available clinical data and pathogenetic prerequisites allow us to consider Aquatopic as a rational component of a barrier-oriented strategy for the treatment of atopic dermatitis in children.

The conducted analytical analysis of the pathogenetic mechanisms of atopic dermatitis in children and the clinical aspects of barrier-oriented therapy allows us to reasonably assert that emollient support occupies a central place in the structure of rational local treatment.

Modern ideas about the disease, formed in 2010–2024, consider disruption of the epidermal barrier not as a secondary phenomenon, but as a key link in pathogenesis, determining the chronicity of the inflammatory process and the tendency to relapse. In this regard, the regular use of emollients aimed at restoring the hydrolipid mantle and reducing transepidermal water loss acquires strategic rather than auxiliary importance.

Analysis of clinical dynamics and comparison with data

from international and Russian recommendations indicate that systematic care helps reduce the severity of xerosis, reduce the intensity of itching and reduce the frequency of exacerbations. Emollient "Aquatopic", containing moisturizing and lipid-restoring components, demonstrates pathogenetic relevance to the tasks of barrier therapy for atopic dermatitis in pediatric practice.

Provided the correct application technique, sufficient volume and continuity of use during the inter-relapse period, it is possible to achieve a clinically significant improvement in subjective and objective indicators. It should be emphasized that emollient therapy does not replace anti-inflammatory drugs in the active process phase, but provides a basis for maintaining remission and potentiates the effectiveness of a stepwise treatment regimen.

The findings are consistent with recent trends that emphasize the need for early and long-term barrier care in children with atopic skin phenotype. A limitation of the analysis is the lack of a randomized comparative study, which dictates the need for further clinical work with the inclusion of objective parameters (TEWL, assessment of the epidermal lipid profile, microbiome analysis). However, the combination of pathogenetic prerequisites and clinical observations allows us to consider Aquatopic as a rational component of complex local therapy for atopic dermatitis in children.

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