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Case Report

Furfuryl palmitate emollient in pediatric atopic dermatitis: real-world case report

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ABSTRACT

Atopic dermatitis (AD) is a chronic inflammatory disease that can be characterized by impaired barrier dysfunction, immune dysregulation, and oxidative stress. While long-term corticosteroid therapy is effective for the treatment of AD, safety concerns often limit use and contribute to poor adherence, especially in children, thus compelling the need for safer, non-steroid options. Furfuryl palmitate, a strong antioxidant with skin barrier-protective properties, has been shown to reduce oxidative damage and inflammation in AD. This case report focuses on two children, aged 4 and 9 years, with moderate AD [eczema area and severity index (EASI) scores 18-19.5] treated with Relizema® cream, which contains furfuryl palmitate. They received it either as ongoing treatment after stopping corticosteroids or along with calcineurin inhibitors. Between 3 and 6 months of treatment, both children demonstrated significant clinical improvement, including improvement in erythema, pruritus, and lichenification, and there were no adverse effects or disease flares. Improvements were also noted in sleep quality, emotional well-being, and caregiver stress. The dual mechanism of hydration and modulation of oxidative stress with furfuryl palmitate is an effective strategy for long-term management of AD to maintain long-term remission, while increasing adherence. This case report supports furfuryl palmitate in the cream form as an effective, well-tolerated, non-steroid option for pediatric patients with AD, and furfuryl palmitate cream is another valuable resource for long-term proactive management of AD that aims to restore the barrier function of the skin and prevent relapses of AD.

Keywords: Atopic dermatitis, Furfuryl palmitate, Relizema, pediatric, Steroid-sparing, Oxidative stress

INTRODUCTION

Atopic dermatitis (AD), commonly referred to as eczema, is a chronic skin condition characterized by inflammation, redness, and itching.[1] This condition long-term condition, marked by intense itching, typically begins in infancy and manifests as dry skin, eczema-like rashes, and thickened areas resulting from scratching. AD is often linked to other IgE-mediated conditions such as asthma, allergic rhinitis, and food allergies. It carries a considerable burden on affected individuals, and its prevalence appears to have risen in recent decades.[2] AD affects approximately 2.6% of the global population (≈204 million individuals), with prevalence around 4.0% in children (≈103 million) and 2.0% in adults (≈101 million), exhibiting higher rates in females than males.[3] According to a systematic review, in India, the prevalence of AD amongst children up to 16 years of age has been reported to range between 3.1% and 7.21%. Studies that included both pediatric and adult populations have shown a broader prevalence range, from 0.98% to 9.2%.[4]

AD involves skin barrier dysfunction driven by genetic and environmental factors, and oxidative stress-related factors, with moisturizers playing a key role in barrier repair.[5-7] Traditional treatment approaches for AD have

relied heavily on topical corticosteroids and, in more severe cases, systemic immunosuppressants or calcineurin inhibitors. While effective, long-term use of steroids is often associated with concerns about skin atrophy, tachyphylaxis, and systemic absorption, especially in younger children.[8] Parents of children with AD often experience steroid phobia, which is fear or anxiety about using topical corticosteroids, which can lead to poor adherence and subsequent treatment failure.[9] As a result, they agree to use alternative medications as long as these do not contain steroids.[10] Topical non-steroidal therapy can be an effective option in such cases.

Emollient-based moisturizers are standard for skin barrier repair, but emerging evidence suggests that adding topical antioxidants may enhance protection against oxidative stress. Studies show that barrier-enhancing moisturizers with antioxidants can be as effective as corticosteroids in improving skin permeability.[11] Recent innovations in AD therapy have introduced non-steroidal options such as topical PDE4 inhibitors and JAK inhibitors.[12] Studies have highlighted furfuryl palmitate as a safe and effective option for mild-to-moderate AD and related dermatoses, with potential use as a steroid-sparing or replacement therapy.[11,13] Furfuryl palmitate acts primarily as a potent antioxidant, neutralizing singlet oxygen to reduce oxidative stress and support skin health, particularly in conditions like AD.[11]

The following case report describes two pediatric patients with moderate AD who demonstrated clinical improvement using Relizema cream (furfuryl palmitate), either as adjunctive or maintenance therapy, reinforcing the growing role of non-steroidal agents in the evolving treatment landscape.

CASE REPORT

Case 1: 4-year-old female

A 4-year-old girl with Fitzpatrick skin type 5 presented with AD first noted at 18 months of age with itching and rashes on the face and legs. Her condition was diagnosed by a dermatologist and remained continuous but clinically stable, with three reported flares over the past year, typically worsening during the winter months. Known triggers included dust exposure, and while there were no food-related exacerbations. The current examination revealed involvement of the cubital and popliteal fossae, face, and trunk, with signs of oozing, crusting, lichenification, and post-inflammatory changes. Pruritus was severe at night, causing sleep disturbances. Her EASI score was 19.5.

Laboratory investigations revealed elevated total immunoglobulin E (IgE) (2500 IU/mL) and a positive Phadiatop level (76.2), suggestive of allergic sensitization. There was no family history of atopy or autoimmune disease. The patient had previously used crisaborole ointment with satisfactory results and mometasone ointment for 6 weeks continuously, followed by a step-down to weekend use (for 6 weeks). She had no history of systemic steroids or immunosuppressants. For the past three months, the patient has been maintained on Relizema cream applied all over the body, along with levocetirizine syrup (3.5 mL twice daily). The regimen was well-tolerated with no reported irritation or difficulty in application. Notably, no flares occurred after discontinuation of topical steroids, and the patient showed improved sleep, reduced caregiver stress, and stabilization of skin lesions. Relizema was instrumental in maintaining remission, and proactive twice-weekly steroid therapy was planned to minimize relapses.

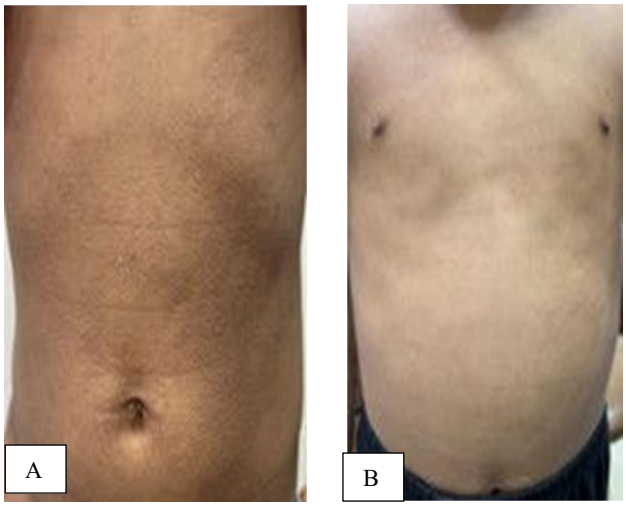

Figure 1 (A and B): Before and after use of furfuryl palmitate emollient (case 1).

Case 2: 9-year-old male

A 9-year-old boy with Fitzpatrick skin type 5 presented with AD. Symptoms began at the age of 2 with pruritic, eczematous rashes on the extremities and gradually progressed to include the face, neck, cubital, popliteal regions. Sweating was identified as the primary trigger, and seasonal flares were more frequent during the summer. The patient experienced three notable flares in the preceding 12 months. He reported persistent pruritus and sleep disturbances, and his lesions were characterized by oozing, crusting, and post-inflammatory pigmentation without secondary infection. His EASI score was documented at 18.0.

Although specific IgE and Phadiatop tests were not performed, his eosinophil count was mildly elevated (200). There was no personal or family history of food allergies, autoimmune disorders, or atopy. He had previously received systemic corticosteroids before the current dermatologist took over care. The current regimen included Relizema cream, used for both moisturization and barrier repair, applied to all affected areas. Tacrolimus 0.1% ointment was used as maintenance therapy, while mometasone was reserved for flares. Levocetirizine was given once daily at night, with good effectiveness. He also

received oral cyclosporine five months ago. The patient's adherence was satisfactory, with no local side effects reported. Since initiating Relizema cream six months ago, the child has demonstrated improved disease control, fewer missed school days, and better quality of life. Emotional well-being also improved, with reduced irritability and embarrassment.

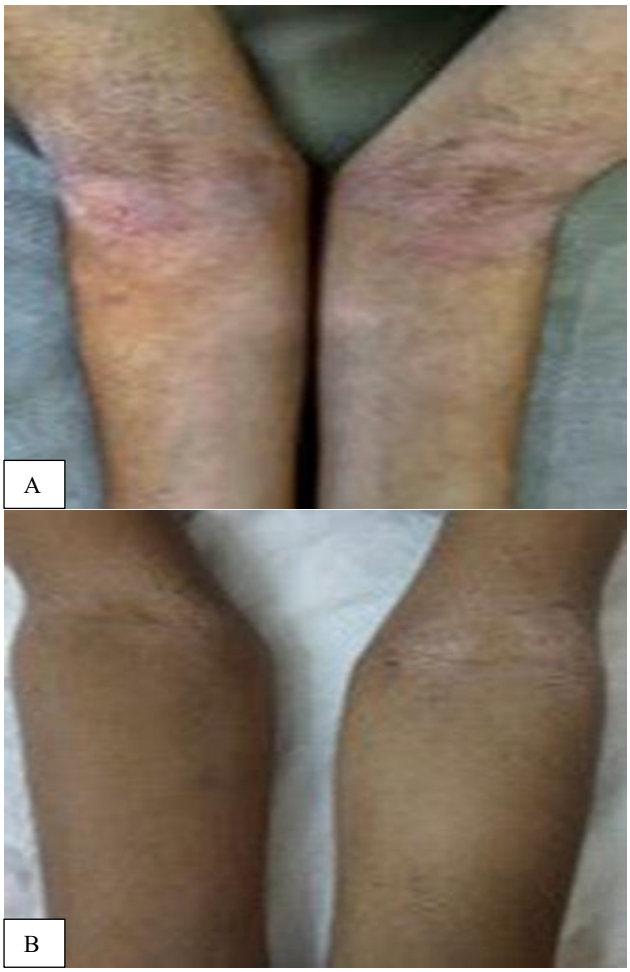

Figure 2 (A and B): Before and after use of furfuryl palmitate emollient (case 2).

DISCUSSION

The two pediatric cases presented in this case report highlight the evolving paradigm of AD management, where emphasis has shifted from reactive corticosteroid use to sustained barrier maintenance with non-steroidal alternatives. Both patients exhibited moderate disease severity (EASI 18-19.5), which is clinically significant as children in this range often require prolonged topical corticosteroid use or, in severe cases, systemic therapy. This makes steroid-sparing options highly desirable for safety and quality-of-life considerations.

Role of barrier dysfunction and oxidative stress in AD pathogenesis

AD pathophysiology is increasingly understood as a multifactorial disorder, with skin barrier impairment and immune dysregulation being central elements. Filaggrin mutations, lipid imbalance, and increased transepidermal water loss (TEWL) compromise skin integrity, making patients more susceptible to allergens, irritants, and infections.[5] Additionally, oxidative stress has emerged as a critical driver of inflammation and tissue damage in AD.[11] Reactive oxygen species (ROS) amplify inflammatory cascades, disrupt barrier proteins, and perpetuate the chronicity of disease.[14] Conventional emollients provide hydration but do not directly target oxidative stress, leaving this pathological pathway unaddressed.

Steroid phobia

Steroid phobia, characterized by negative perceptions and concerns about the safety of TCS, remains a significant barrier to effective management of AD. These concerns may range from mild hesitation to severe, irrational fear regarding TCS use in both pediatric and adult populations, and are sometimes shared by healthcare professionals, including nurses, pharmacists, and physicians. Such apprehensions can lead to poor treatment adherence, ultimately compromising disease control and patient outcomes.[15] To address this issue, non-steroidal topical therapies present a valuable alternative. Among these, furfuryl palmitate has gained attention for its antioxidant and anti-inflammatory properties.

Mechanistic advantage of furfuryl palmitate

Furfuryl palmitate is a lipophilic antioxidant that neutralizes free radicals, thereby reducing oxidative burden in keratinocytes and restoring barrier homeostasis.[11,12] By integrating both hydration and antioxidant mechanisms, Relizema offers dual benefits:

Barrier restoration: Through occlusive and humectant effects, reducing TEWL.

Oxidative stress modulation: Potentially attenuating the inflammatory loop by neutralizing ROS.

This dual approach may explain the observed improvements in both cases, particularly the absence of flares after steroid withdrawal in case 1, suggesting a stabilizing effect on disease activity.

Clinical implications of real-world use

Both patients tolerated Relizema without local irritation, allergic reactions, or compliance issues. Ease of application and favorable sensory attributes likely contributed to adherence, an often-overlooked determinant of treatment success in pediatric AD. Importantly, adjunctive use in combination with calcineurin inhibitors (Case 2) and as maintenance therapy after corticosteroids

(Case 1) mirrors real-world clinical practice, where multi-modal strategies are employed to optimize outcomes.

Alignment with proactive therapy model

Modern guidelines advocate proactive maintenance therapy, involving intermittent anti-inflammatory agents or barrier-focused interventions during remission phases to prevent relapse.[16,17] These cases illustrate how furfuryl palmitate-based emollients can seamlessly integrate into this approach. Unlike corticosteroids, which are limited by safety concerns, Relizema can be safely used long-term, offering continuous barrier support and relapse prevention.

Quality-of-life and psychosocial outcomes

Beyond clinical parameters, both cases demonstrated improvements in sleep quality, caregiver stress, and emotional well-being. These factors are particularly relevant in pediatric AD, where disease burden extends beyond physical symptoms, affecting schooling, social interactions, and family dynamics. By stabilizing disease activity and reducing flare frequency, Relizema indirectly supports psychosocial health, an often underreported but critical outcome.

Clinical evidence

Several clinical trials have evaluated the efficacy and safety of furfuryl palmitate–based formulations in inflammatory skin conditions, particularly AD. In a double-blind, randomized, placebo-controlled study, Patrizi et al assessed 60 pediatric patients with mild to moderate AD and pityriasis alba, comparing sorbityl furfural palmitate cream to placebo. After 30 days of twice-daily application, the treatment group showed a significant reduction in itching and clinical severity ($p=0.01$) with no severe adverse events.[18] Nemelka et al conducted a unilateral trial on 60 pediatric patients, using a formulation containing superoxide dismutase, 18 beta-glycyrrhetinic acid, vitamin E, alpha bisabolol, and furfuryl palmitate, showing notable improvement in inflammation over 2 weeks without adverse effects.[19] Similarly, Bocchietto et al performed another unilateral trial with 108 participants (64 adults and 44 children) using the same antioxidant complex, reporting decreased erythema and itching after twice-daily application for 2 weeks, again with no adverse reactions.[11] In a double-blind, randomized, placebo-controlled study, Pigatto et al evaluated 40 adults with AD treated with Furpalmate cream versus vehicle, observing significant symptom improvement over 21 days without severe adverse events.[11]

Lauriola et al conducted an investigator-blind, randomized, controlled trial comparing Furpalmate to a topical corticosteroid in 40 adult patients with hand AD. Both groups showed significant clinical improvement over 14 days, with no significant difference between them, suggesting comparable efficacy.[11] A post-marketing study involving 40 users of Relizema™ cream (containing furfuryl palmitate and tocopherol) reported rapid improvement in itching and flushing, most within one day to a week, and all users noted moisturizing and protective effects.[20] Collectively, these studies highlight furfuryl palmitate's therapeutic potential as a non-steroidal, antioxidant-based treatment for AD and related dermatoses, with good safety and efficacy profiles, especially in mild to moderate disease.

Positioning within emerging therapies

While newer pharmacologic agents like topical PDE4 inhibitors and JAK inhibitors offer targeted immune modulation, their use is restricted by cost, accessibility, and safety considerations in children.[8] Furfuryl palmitate-based emollients, by contrast, provide a cost-effective, safe, and easily accessible adjunct, aligning well with global trends toward personalized, barrier-centric AD management.

Given the chronic and relapsing nature of AD, especially in children, steroid-sparing options like Relizema cream offer a safer long-term solution and are increasingly favored in clinical practice. The antioxidant-enriched composition provided relief from eczema. Because of its steroid-free formulation, the Relizema cream can be used as part of a long-term maintenance regimen to prolong remission, avoid recurrence, and maintain good skin condition. While these case studies are limited by sample size and observational design, they add to a growing body of anecdotal and emerging clinical evidence supporting the utility of furfuryl palmitate-based treatments in pediatric AD.

Limitations

Despite encouraging findings, these observations are limited by the inherent constraints of case report: absence of a control group, small sample size, and subjective outcome reporting. Objective assessments such as validated quality-of-life scores and longitudinal follow-up would strengthen evidence. Future randomized controlled trials are warranted to compare furfuryl palmitate-based emollients against standard moisturizers and assess their role in reducing corticosteroid dependency and flare frequency.

CONCLUSION

Relizema, a furfuryl palmitate-based emollient, provided effective and well-tolerated barrier repair in pediatric AD, reducing reliance on corticosteroids and improving overall disease control. Its antioxidant property confers an added therapeutic dimension beyond hydration, positioning it as a valuable component of proactive, long-term management strategies. These findings support further exploration of antioxidant-enriched emollients as safe, steroid-sparing options in pediatric AD care.

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