

Pediatric Atopic Dermatitis Patient Cases Integrating Ceramides-Containing Cleansers and Moisturizers into Prescription Treatment and Maintenance Approaches

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ABSTRACT

Introduction: Atopic dermatitis (AD) is a common, chronic recurrent disorder typically starting in infancy and early childhood and associated with pruritus and genetic predisposition. Daily use of moisturizers that contain lipids such as ceramides (CER) reduces the rate of AD flares and the need for topical steroid treatment.

A pediatric AD case series is presented to educate healthcare providers treating children with AD to tailor AD prescription therapy, skincare, and maintenance treatment to improve patient outcomes.

Methods: The advisors discussed 15 pediatric AD patient cases and agreed to select six patients covering various presentations of pediatric AD, patient ages, and skin types.

Results: The advisors discussed why they selected the case, previous treatment, type of prevention and education provided, skincare as mono or adjunctive treatment, prescription and nonprescription therapy and maintenance treatment, and clinical pearls. Two patient cases discuss infants with early onset AD who benefitted from frequent and ongoing ceramide-containing skincare. The other four patient cases present children aged 2 to 9 years who benefitted from skincare as an adjunct to topical corticosteroid therapy.

Conclusion: Sharing best practices in AD therapy and maintenance treatment for pediatric AD patients may support healthcare providers treating newborns, infants, and children to improve clinical outcomes. Consistent skincare use with ceramide-containing cleansers and moisturizers as mono or adjunctive to prescription treatment promoted a healthy skin barrier.

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INTRODUCTION

Atopic dermatitis (AD) is a common, chronic-recurrent disorder associated with pruritus and genetic predisposition diagnosed at a mean age of 1.6 years.^{1,2} The first AD flares frequently occur in infancy and may recur or persist during childhood and adulthood.¹⁻³ Persistent severe AD is somewhat more associated with the female sex and onset after two years of age.³ Guidelines and algorithms for treating AD in pediatric and adult patients have recommended skincare using cleansers and moisturizers as monotherapy in mild to moderate flares or as an adjunct to prescription and nonprescription AD treatment and maintenance.⁴⁻⁶

Ongoing, daily use of moisturizers that contain lipids such as ceramides (CER) reduces the rate of AD flares and the need for topical steroid treatment.^{7,8}

A pediatric AD case series is presented to educate healthcare providers treating newborns, infants, and children with AD to tailor AD prescription and nonprescription therapy, skincare, and maintenance treatment to improve patient outcomes.

MATERIALS AND METHODS

A panel (advisors) of 8 pediatric dermatologists, dermatologists, and pediatricians who treat pediatric AD patients reported on clinical cases from their practice. Evidence from the literature and the panels' expert opinions, experiences, and key insights reflect the advisors' use of CER-containing skincare

as monotherapy or as an adjunct to prescription treatment for pediatric patients with AD. In addition, a review of findings reflects real-world clinical use of CER-containing skincare and how patients can benefit from its treatment, ie, "what experienced specialists are doing for their pediatric AD patients"










During the February 11, 2023, meeting, each advisor presented pediatric AD patient cases from their practice. A CER-containing skincare regime was used as adjunctive treatment or monotherapy for pediatric AD patients. The advisors gathered patient case information on gender, age, Fitzpatrick skin phototype,⁹ AD history, presentation, a treatment plan summary, results, and key learning points. The self-recorded skin type used a Fitzpatrick score from phototype I up to Type VI (Type I [scores 0–6] always burns, never tans, Type II [scores 7–13] usually burns, tans minimally, Type III [scores 14–20] sometimes mild burn, tans uniformly [golden honey or olive], Type IV [scores 21–27] burns slightly, always tans well, Type V [scores 28–34] very rarely burns, tans very easy [dark brown], and Type VI [scores 35–36] never burns [richly pigmented]).⁹

Of the 15 cases presented during the meeting, the advisors agreed to select six patient cases covering various ages and skin types, including pediatric patients with richly pigmented skin, and give a logical flow from infants to children.

Pediatric Atopic Dermatitis Patient Case Series

The advisors discussed why they selected the case, previous treatment, type of prevention and education provided, skincare as mono or adjunctive treatment, prescription and nonprescription therapy

TABLE 1.**Case 1: A 4-Month-Old Boy With Fitzpatrick Phototype III and Onset of AD at 1-Month of Age**

Before	Week 4 visit	Week 12 visit
 <p>Erythema covers his back.</p>	 <p>Erythema is reduced but still present on the left side.</p>	 <p>AD on his back has cleared.</p>
 <p>Erythema and xerosis cover his torso, forehead, arms, and legs.</p>	 <p>Torso, forehead, arms, and legs have improved markedly.</p>	 <p>Torso, forehead, arms, and legs have cleared.</p>
 <p>Erythema covers his torso, forehead, arms, and legs.</p>	 <p>Torso, forehead, arms, and legs have improved markedly.</p>	 <p>Torso, forehead, arms, and legs have cleared.</p>

Case and photographs are courtesy of Dr. Dones

and maintenance treatment, and clinical pearls. The advisors felt the case studies presented during the meeting and the six selected cases presented in the paper were a comprehensive collection of typical presentations covering the necessary teaching points.

Patient 1: This 4-month-old boy with Fitzpatrick phototype III has had eczema since he was one month old (Table 1). He had neonatal acne, seborrhea, and bronchiolitis at three months old. AD was present all over his face, trunk, and extremities from one month of age. The infant's condition caused maternal anxiety. Previously, no skincare or medical treatment was used. At week 2, CER-containing baby wash, shampoo, and 1% hydrocortisone cream were started. At week 4, a CER-containing moisturizing cream was added to the regime, and at week 12, crisaborole twice daily was added. Over the 12-week observation period, the infants' skin condition had markedly improved.

The main lessons learned: A newborn with persistent erythema and xerosis may develop AD flares early on.³ Therefore, it is crucial to start educating parents about the importance of maintaining a healthy skin barrier as early as the prenatal or first newborn visit.⁴⁻⁸

Patient 2: This 2-month-old boy with Fitzpatrick phototype IV presented with deep dark red oozing lesions covering his face and abdomen, which started immediately after birth (Table 3). A baby petrolatum-containing ointment was recommended but not consistently used. The lesions were previously

treated with mupirocin ointment and oral cephalexin for presumed secondary bacterial infection. His skin condition first improved and then deteriorated, and cultures at one time grew methicillin-resistant *Staphylococcus aureus* (MRSA). The parents consulted a dermatologist who addressed the presumed infection and recommended continuing mupirocin. A different culture was done five days before the visit to our clinic, which showed *Enterococcus faecalis* and *Escherichia coli*. The parents were educated about their infant's skin condition and the situations and products that may trigger skin breakouts. The role of CER-containing skincare in AD treatment and maintenance was discussed with the parents. Treatment started with a CER-containing baby moisturizing wash, twice daily liberal use of CER-containing healing ointment, and once daily application of a fluocinolone-containing oil, a very low potency topical steroid. The evolution of the infant's skin condition was closely followed by phone. After using the CER-containing healing ointment and once daily application of a fluocinolone-containing oil for five days, his facial and abdominal skin condition improved markedly. At the week 6 visit, the healing ointment was replaced with a CER-containing baby lotion three times daily, which, together with the CER-containing baby moisturizing wash, is continued ongoing.

The main lessons learned: Educating parents about maintaining a healthy skin barrier as early as the prenatal or first newborn visit is important. Secondary infection may result from impaired skin barrier function and dysbiosis related to AD.^{10,11} Consistent use of CER-containing skincare from birth can markedly improve AD in infants.^{7,8}

TABLE 2.**Case 2: This 2-Month-Boy With Fitzpatrick Phototype IV has had Severe Facial and Abdominal AD Since Birth**

Before	Week 4 visit	Week 12 visit
 <p>Deep dark red oozing lesions covering the forehead, eyelids, and the lower part of the face.</p>	 <p>The forehead and eyelids have almost cleared, and the lower face has improved, with erythema present on the upper lip.</p>	 <p>Skin condition markedly improved. Xerosis requires ongoing skin care.</p>
 <p>Erythema and oozing lesions covering the abdomen.</p>	 <p>The abdomen has almost cleared. The skin around the navel is clear.</p>	 <p>Skin is clear. The remaining xerosis requires ongoing skincare with CER-containing baby wash once daily and CER-containing baby lotion three times daily.</p>

Case and photographs are courtesy of Dr. Keller

Patient 3: This otherwise healthy 9-year-old girl with Fitzpatrick phototype VI has had long-standing AD since she was one year old (Table 3). She had a history of seasonal allergies. She was previously treated with hydrocortisone cream 1% and skincare comprising cocoa butter and coconut oil. The patient reports being embarrassed by the dark patches on her skin and does not want to wear shorts. She received mometasone 0.1% ointment twice daily until clear, followed by crisaborole application once daily. In addition, CER-containing hydrating cleanser and moisturizer were applied twice daily. At the 8-week follow-up, her skin condition had markedly improved, with the skin of her neck cleared.

The main lessons learned: Clinically, AD may present differently in richly pigmented skin. Nuanced expression of erythema and post-inflammatory pigment alterations may be observed in richly pigmented patients with AD.^{12,13} Black patients may show more frequent follicular accentuation, lichenoid morphologies, and papulonodular presentations.^{12,13} Educating the patient and parents about maintaining a healthy skin barrier and reducing inflammation to prevent sequelae is essential. In richly pigmented skin, hyper or hypopigmentation occurs more frequently than in AD patients with white skin.^{12,13}

TABLE 3.**Case 3: 9-Year-Old Girl With Fitzpatrick Phototype VI Has Had AD Since One Year of Age****Before**

Follicular accentuation, lichenoid, and papulonodular presentation.
AD-related hyperpigmentation on the legs results from chronic AD-related inflammation.

Week 8 visit

The neck had cleared, and the hyperpigmentation on the legs has markedly reduced.

Case and photographs are courtesy of Dr. Gonzalez

Prompt and rigorous AD therapy is required to prevent sequelae such as hyper or hypopigmentation. In addition, early and ongoing skincare using a CER-containing hydrating cleanser once daily and a CER-containing moisturizer twice daily promotes maintaining a healthy skin barrier.

Patient 4: This otherwise healthy 8-year-old boy with Fitzpatrick phototype II had seasonal allergies and recurrent AD since early childhood (Table 4). As an

infant, he had frequent flares, which now rarely occur. Currently, he has no treatment for his AD. He presents at the clinic with white, slightly rough patches on bilateral cheeks present for two months, which worsened over the summer months. He spent his summer in a swimming camp. The patient and parents were educated about AD and the situations and products that may trigger flares, such as excessive sun exposure and swimming in pools. The benefits CER-containing skincare may offer for AD treatment and maintenance were discussed with the patient and his parents.

TABLE 4.

Case 4: 8-Year-Old Boy With Fitzpatrick Phototype II

Before



Erythema, xerosis, and discoloration are mainly on the cheeks and right temple.

Week 12 visit



The skin is clear.

Case and photographs are courtesy of Dr. Gonzalez

His face was treated with CER-containing hydrating cleanser once daily, CER-containing cream twice daily, and pimecrolimus 1% cream nightly. In the morning, he was advised to use a CER-containing hydrating mineral sunscreen on the face. Once the AD had cleared, he continued with the CER-containing skincare regime and the CER-containing hydrating mineral sunscreen in the morning.

The main lessons learned: AD may flare after a long period without flares when triggers such as excessive sun exposure, chemicals used in a swimming pool, or xerosis lead to flaring.

It is important to start educating patients and parents about AD and maintaining a healthy skin barrier using frequent and ongoing CER-containing skincare and sun protection with a CER-containing hydrating mineral sunscreen.

Patient 5: This 6-year-old boy with Fitzpatrick phototype I with a family history of asthma and AD presented with recurrent pruritic flares on his arms and body, interfering with his sleep (Table 5).

TABLE 5.

Case 5: 6-Year-Old Boy With Fitzpatrick Phototype I

Before



Pruritic plaques on right wrist and arm and left elbow and inner arm

Week 8 visit



His skin has cleared.

Case and photographs are courtesy of Dr. Lal

He was using triamcinolone cream as needed and crisaborole ointment, which a previous dermatology provider recommended. He used regular bar soap for cleansing and did not use a moisturizer regularly. He presented at the clinic with pruritic plaques on his face and body that interfered with sleep. We prescribed mometasone 0.1% ointment to be used twice daily on the plaques that, when the skin condition is improved, should be tapered twice or three times per week. The patient and his parents received education about his condition and the benefits of a consistent CER-containing skincare routine. We provided a CER-

containing hydrating cleanser to the face and body daily and a CER-containing healing ointment to use once or twice daily. After using the regime for eight weeks, he reported a significant reduction in pruritus, and his skin was clear of visible disease.

The main lessons learned: The lack of a consistent skincare routine for xerotic and atopic skin may trigger flares. CER-containing hydrating cleanser and healing ointment were applied once or twice daily

TABLE 6.**Case 6: 6-Year-Old Girl With Fitzpatrick Phototype I****Before**

Pruritic rashes and scratch marks on her body, arms, and legs.

Week 8 visit

Case and photographs are courtesy of Dr. Lal

and ongoing, clearing and maintaining the resolution of the pruritic plaques that interfered with sleeping. Adding medical-grade skincare can supplement appropriate topical steroids to reduce visible atopic disease and improve symptoms.

Patient 6: This 2-year-old girl with Fitzpatrick phototype I presented with recurrent rashes and scratching in her sleep since infancy (Table 6). She appeared to have a lanolin allergy, which allergy testing did not confirm. She previously used topical mupirocin and nystatin with no improvement. She visited a dermatology provider and received hydrocortisone 2.5% cream, which did not help. She had difficulty sleeping because she was scratching her skin in her sleep. Upon a visit to our clinic, we changed her treatment to alclometasone 0.05% ointment for the face, mometasone 0.1% ointment for the body, and oral hydroxyzine 10 mg. CER-containing hydrating cleanser and CER-containing healing ointment were applied once or twice daily. The parents were also advised to switch detergent to a hypoallergenic product.

After eight weeks of treatment, the patient had a better sleep pattern with less waking up during the middle of the night. The regime had significantly cleared her skin of visible disease.

The main lessons learned: Lanolin-containing products may aggravate AD flares, and switching to lanolin-free skincare products can provide significant improvement with appropriate topical steroids.

DISCUSSION

AD is clinically diagnosed based on history, morphology, distribution of skin lesions, and associated clinical signs and symptoms.^{1-3,14,16} Other factors predicting severity include early-onset (<2 years of age), comorbid atopy, and family history of AD.^{14,16} The diagnosis should be reevaluated, particularly in patients not responding to appropriate treatment, to verify the accuracy of this diagnosis.^{14,16}

Understanding the specific properties of newborn and infant skin and discussing and recommending skincare products and routines to parents may help promote a healthy skin barrier, delaying flares.¹⁶ Daily and ongoing skincare using a gentle cleanser and moisturization is the foundation of AD management, as evidence-based international guidelines recommend.⁴⁻⁶ Moisturizer application initiated in early infancy may delay or prevent AD flares, especially in high-risk populations, and when used continuously.¹⁴⁻¹⁶

Educating parents about the difference between healthy newborn skin and infants predisposed to AD who may have xerosis after birth is instrumental in promoting skin health.¹⁶ When seeing newborns and infants with healthy skin in their clinic, advisors may or may not discuss skincare, and it's rare for parents to bring it up on their own. Advisors recommend building the discussion into the first newborn visit to ensure it happens.

The case series discussed using CER-containing skincare as mono or adjunct to topical treatment in AD. A cohort study on a CER-containing cleanser and moisturizer as monotherapy demonstrated successful outcomes in adults and children with mild-to-moderate AD.¹⁷ A subgroup analysis of a CER-containing moisturizer study on efficacy and safety for children with mild-to-moderate AD showed that 34 (58%) had cleared after three weeks of mono-treatment.¹⁸ Parents of young children are often “stuck on” using specific products and sensitive, culturally influenced bathing and skincare practices.¹⁶ Advisors have found it helpful to defer the discussion about switching products until a rapport has been established with the parent. The advisors observed that parents might be used to the small quantities indicated for topical steroids, thus under-moisturizing their infants. Together with the type of skincare, the advisors provided education on the amount of moisturizer and when to apply it. Advisors strongly agreed on the importance of handouts to educate patients and parents, which should be customizable. When escalating patients to systemic medications for AD, advisors emphasized the importance of maintaining the skincare regimen.

Limitations

The presented cases illustrate the real-world experience of the advisors with their patients rather than reflect a controlled clinical trial data environment, nor do they mirror statistical outcomes. The use of the CER-containing cleanser and moisturizer is at the discretion of the treating healthcare professional.

The studies on CER-containing skincare for adults with AD were not included in the discussion.

CONCLUSION

The presented pediatric AD case series aims to educate healthcare providers treating newborns, infants, and children to tailor AD prescription, nonprescription therapy, skincare, and maintenance treatment to improve patient outcomes.

The six presented cases used skincare products containing lipids such as CERs to promote a healthy skin barrier, delaying flares, and improving outcomes. Sharing best practices in pediatric AD therapy, maintenance treatment, and implementation of consistent skincare use with CER-containing cleansers and moisturizers are important tools for healthcare providers to optimize care for pediatric patients with AD.

DISCLOSURES

The authors received an educational grant and skincare products used for the patient cases from CeraVe US. Parents/caregivers consented to use their child’s case report and photographs. The authors contributed to the cases and permitted to use the photographs.

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