

## COMMENTARY

# Enhancing the skin barrier by emollients in neonates to prevent atopic dermatitis

**Ehrhardt Proksch**

Department of Dermatology, University of Kiel, Kiel, Germany

**Correspondence**

Ehrhardt Proksch, Department of Dermatology, University of Kiel, Kiel, Germany.

Email: [eproksch@dermatology.uni-kiel.de](mailto:eproksch@dermatology.uni-kiel.de)

The importance of the skin barrier for the pathogenesis of atopic dermatitis (AD) is now well accepted. A degraded skin barrier allows the immune system inappropriate access to environmental allergens, leading to sensitization and the initiation of atopic dermatitis.<sup>1,2</sup> Bland creams and ointments may heal or ameliorate atopic dermatitis and may help in preventing relapses of the disease. Therefore, the idea developed that enhancing the skin barrier in babies by emollients may prevent atopic sensitization. Simpson et al., and Horimukai et al., in 2014 in well-remarked studies showed that emollient use in neonates prevents the development of AD.<sup>3,4</sup> In most of several subsequent studies, these results were not confirmed. In line with these studies, Kottner et al., in this issue of the JEADV, did not find that regular emollient application during the first year of life prevents AD.<sup>5</sup> However, in some of the studies, a positive trend for preventing AD or improving the symptoms was shown. Also, Kottner et al. found that if AD developed it was more severe in the control group. Even more, a recent study from Ireland presented by Chaoimh et al.<sup>6</sup> found a statistically significant 33% reduction of AD in the intervention group, confirming the 32% and 50% reduction in the first studies published in 2014. Chaoimh et al. explained their success because of early intervention immediately after birth. They had shown that trans-epidermal water loss (TEWL) increased from birth to 2 months but stabilized thereafter, suggesting beginning of intervention as soon as possible after birth and a need for a shorter intervention period, only. In two of the failed studies, interventions began at a median age of 11 days or 2 weeks. In addition, in some of the failed studies petrolatum and paraffin-based emollient formulations were used, while Chaoimh and Hormukai used more refined emulsion-type

moisturizers consisting of cetearyl alcohols, fatty acids, and glycerin, and ceramide-3, claimed to specifically target at improving the skin barrier, or a hypoallergenic moisturizer milk for sensitive skin prone to dryness, respectively. Further basic and applied research may be necessary to create emollients which specifically improve the skin barrier in babies against epidermal ingress of allergens. Recently, the term emollient plus has been created, which refers to topical formulations with vehicle plus additional active, non-medicated substances. A previous study published in the JEADV with an emollient containing ceramide and filaggrin-associated amino acids showed a trend for preventing AD.<sup>7</sup> Until now, it is only known in part which ceramides, which filaggrin-associated amino acids or additional compounds in emollients are best for improving skin barrier. Some ingredients, for example some plant oils, may have an opposite effect, may irritate the skin, worsen the skin barrier and enhance allergen penetration. Also, it would be very important to know which allergens are the most dangerous for atopic sensitization and how to prevent penetration. In addition, it would be important to better classify the group of babies where intervention is advisable. Intervention does not seem to work in babies without a risk for AD. Chaoimh et al. were successful with term infants at high risk of AD, parental history of AD, asthma or allergic rhinitis; further subgroups may be possible. In summary, though several studies failed to show a significant effect, some of the studies using very early intervention in babies at high risk and with specialized emollients targeted at improving the skin barrier showed a significant or a trend in reduction in AD. Further improvements in emollients and very early intervention in neonates may successfully reduce AD.

Linked article: J. Kottner et al. *J Eur Acad Dermatol Venereol* 2023; 37:540–548. <https://doi.org/10.1111/jdv.18698>.

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial-NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2023 The Author. *Journal of the European Academy of Dermatology and Venereology* published by John Wiley & Sons Ltd on behalf of European Academy of Dermatology and Venereology.

## ACKNOWLEDGEMENT

Open Access funding enabled and organized by Projekt DEAL.

## CONFLICT OF INTEREST

No conflict of interest.

## DATA AVAILABILITY STATEMENT

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

## REFERENCES

1. Fölster-Holst R, Galecka J, Weißmantel S, Dickschat U, Rippke F, Bohnsack K, et al. Birch pollen influence the severity of atopic eczema – prospective clinical cohort pilot study and ex vivo penetration study. *Clin Cosmet Investig Dermatol*. 2015;8:539–48.
2. Werfel T, Heratizadeh A, Niebuhr M, Kapp A, Roesner LM, Karch A, et al. Exacerbation of atopic dermatitis on grass pollen exposure in an environmental challenge chamber. *J Allergy Clin Immunol*. 2015;136:96–103.
3. Simpson EL, Chalmers JR, Hanifin JM, Thomas KS, Cork MJ, McLean WH, et al. Emollient enhancement of the skin barrier from birth offers effective atopic dermatitis prevention. *J Allergy Clin*. 2014;134:818–23.
4. Horimukai K, Morita K, Narita M, Kondo M, Kitazawa H, Nozaki M, et al. Application of moisturizer to neonates prevents development of atopic dermatitis. *J Allergy Clin Immunol*. 2014;134:824–30.
5. Kottner J, Hillmann K, Fastner A, Conzade R, Heidingsfelder S, Neumann K, et al. Effectiveness of a standardized skin care regimen to prevent atopic dermatitis in infants at risk for atopy: a randomized, pragmatic, parallel-group study. *J Eur Acad Dermatol Venereol*. 2023;37:540–8. <https://doi.org/10.1111/jdv.18698>
6. Chaoimh CN, Lad D, Nico C, Puppels GJ, Wong XFCC, Common JE, et al. Early initiation of short-term emollient use for the prevention of atopic dermatitis in high-risk infants-the STOP-AD randomised controlled trial. *Allergy*. 2022. <https://doi.org/10.1111/all.15491>
7. McClanahan D, Wong A, Kezic S, Samrao A, Hajar T, Hill E, et al. A randomized controlled trial of an emollient with ceramide and filaggrin-associated amino acids for the primary prevention of atopic dermatitis in high-risk infants. *J Eur Acad Dermatol Venereol*. 2019;33:2087–94.

**How to cite this article:** Proksch E. Enhancing the skin barrier by emollients in neonates to prevent atopic dermatitis. *J Eur Acad Dermatol Venereol*. 2023;37:463–464. <https://doi.org/10.1111/jdv.18857>