

SLS – A Reminder of the Detrimental Effects of SLS-Containing Emollients on the Skin Barrier

By Julie Van Onselen – Dermatology Lecturer Practitioner and Dermatology Clinical Nurse Specialist

'Don't use soap! 'Don't have bubble baths!' 'Don't use foaming wash products!' This is general patient advice for any patient with dry skin or an inflammatory skin condition. But why is this advice so important for skin care?

Soap and bubble bath contain surfactants, labelled on the product as sodium lauryl sulfate (SLS) or sodium laureth sulphate (SLES). SLS is contained in many personal care and cleaning products. Its purpose is to combine product qualities to make a formulation; for example, water and oil in a cleansing product will only mix when bonded, and the action of molecules blending causes foaming which dissolves dirt and grease for skin cleansing. In general, any skin care product that foams or bubbles is likely to contain SLS, and this includes some leave-on emollients, such as aqueous cream.

"Up to 56% of patients prescribed an SLS-containing cream developed an immediate cutaneous reaction within 20 minutes of application, with symptoms of burning, stinging, itching and inflammation, which did not occur with other non-SLS emollients prescribed."

People with dry and inflammatory skin conditions should avoid products that contain SLS. This evidence was first documented in 2003, in an audit at Sheffield Children's Hospital, where out of 100 children with atopic eczema, 71 were prescribed



aqueous cream containing SLS, and up to 56% developed an immediate cutaneous reaction within 20 minutes of application, with symptoms of burning, stinging, itching and inflammation, which did not occur with other non-SLS emollients prescribed.¹ The conclusion from this study was that aqueous cream with SLS should not be used as a leave-on emollient for children with eczema, and this was endorsed by the MHRA.² However, aqueous cream continued to be prescribed in large amounts and from 2004 to 2008, emollient prescribing increased by 38% with aqueous cream the most prescribed treatment. In 2023-24, aqueous cream was still being prescribed by ICBs in NHS England and accounted for £528,240 of prescribing budget, which shows that prescribing of aqueous cream is widespread.³

In 2010, a study looked at the physical effects of SLS on the skin barrier of healthy volunteers, with no history of eczema. This study compared the forearms of volunteers, where aqueous cream (containing 1% SLS) was applied to one forearm, and no products to the corresponding forearm. This study proved the detrimental effect of SLS on a healthy skin barrier, as skin where aqueous cream containing SLS had been applied showed a decrease in stratum corneum thickness and increases in trans-epidermal water loss (TEWL).⁴ This study was repeated in 2011 in people with atopic eczema, and application of aqueous cream (containing 1% SLS), showed elevation of TEWL and a decrease in stratum corneum integrity.⁵ A further study investigated change in corneocytes maturity and protease activity in healthy volunteers, which gave evidence that aqueous cream containing SLS was associated with inflammatory activity.⁶

MENTHODERM®

MENTHOL IN AQUEOUS CREAM

Helps to cool and soothe dry, over-heated, itchy skin



The **only 0.5% - 5% range** of Menthol in Aqueous Cream to be **SLS Free**



0.5%

1%

2%

5%

Available in four SLS free strengths 0.5%, 1%, 2% and 5%. Comes in 100g tubes, 500g pumps and pots*

*Not all strengths are available in all pack sizes

Order your free samples online
Menthoderm.co.uk



MEN/253/0724 Date of preparation: July 2024



Another trusted product from

The role of the epidermal skin barrier in atopic eczema has been widely researched. Atopic eczema is an immunological disease which arises as a result of gene-environment interaction.⁷ There is an elevation of stratum corneum proteases due to FLG-mutation, which increase TEWL and elevates skin pH, resulting in skin barrier disruption and breakdown, allowing allergy penetration and resulting in dry and inflammatory skin.⁷

It is worth noting that today, many aqueous cream emollients are SLS-free. First-line therapy for atopic eczema and dry skin conditions is the intensive use of emollients, which includes replacing all soaps and avoiding harsh surfactant-based wash products.

"Menthol is a helpful ingredient for pruritus when added to a non-SLS containing emollient."

The evidence is clear on the detrimental effects of SLS: any emollient containing SLS used as a leave-on emollient and for washing will exacerbate skin barrier damage and not restore the skin barrier. A key action of all emollients is skin barrier restoration. This advice is contained within dermatology professional guidance, including NICE, BAD, BDNG and PCDS. A current concern

in emollient prescribing and formulary guidance is that it is often price rather than formulation driven. Today, there are many generic and low-priced aqueous cream emollients, alongside higher quality emollients, as well as aqueous cream with added menthol – many of which are SLS-free. It is important that healthcare professionals are aware that SLS is harmful for people with inflammatory skin conditions and older people without eczema, but with dry skin and vulnerable skin barriers. Menthol is a helpful ingredient for pruritus when added to a non-SLS containing emollient. In conclusion, all emollients containing SLS should not be prescribed or advised for any dermatology patient in any healthcare setting.

References

1. Cork M, Timmins J, Holden C. An audit of the adverse drug reactions in children with atopic eczema. *The Pharmaceutical Journal*. 2003; 271: 747-745.
2. MRHA. Aqueous cream may cause skin irritation. 2014. Available at: <https://www.gov.uk/drug-safety-update/aqueous-cream-may-cause-skin-irritation> [accessed 9 July 2024]
3. Open Prescribing. Aqueous cream BP prescribing data, NHS England. April 23-24. Available at: <https://openprescribing.net> [accessed 9 July 2024]
4. Tsang M, Guy RH. Effect of aqueous cream BP on human stratum corneum in vivo. *Br J Dermatol*. 2010; 163: 954-8.
5. Cork M, Danby S. Aqueous cream damages the skin barrier. *Br J Dermatol*. 2011; 164:1179-1180
6. Mohammed D, Matts PJ, Hadgraft J, Lane ME. Influence of aqueous cream BP on corneocyte size, maturity, skin protease activity, protein content and transepidermal water loss. *Br J Dermatol*. 2011; 164: 1304-10.5.
7. Danby S and Cork M. A new understanding of atopic dermatitis: the role of epidermal barrier dysfunction and sub clinical inflammation. *J Clin Dermatol*. 2010; 1: 33-46.