

Current Controversies in the Management of Atopic Eczema and the Role of Complete Emollient Therapy

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The skin barrier

The skin provides a barrier to the loss of water and prevents the penetration of irritants and allergens from the environment. The extracellular lipids are the main component of the stratum corneum. The lipids originate from the lamellar bodies in the stratum granulosum and are discharged exophytically at the interface of the stratum granulosum and the stratum corneum. The lipids then diffuse between the corneocytes and organise into broad laminated sheets that entirely fill the intercorneocyte spaces.

The intercellular lipids of the normal skin are made up of 40% ceramides, 25% cholesterol, 10% cholesterol sulphate and 25% free fatty acids. Six types of ceramides are found in the human skin. In atopic skin, it was found that the levels of ceramide type 1 and 3 were reduced, and the changes were dependent on disease activity.

Apart from intercellular lipids, there are other substances that affect the permeability and the water binding properties of the skin. Natural moisturising factors originate from the breakdown of filaggrin. They include urea, urocanic acid, 2-pyrrolidine-5-carboxylic acid (PCA) and lactates. Lactate is a significant component of the natural moisturising factors. Three percent of the dry weight of stratum corneum is actually made up of lactates. Sebaceous lipids also help maintain the water content of the skin by forming an emulsion with sweat over its surface.

Abnormal barrier function

In atopic eczema, there is a disturbance of the extruding mechanism of the lamellar bodies into the inter-corneocyte space. As a result the barrier lipids in

the lower part of the stratum corneum are not formed normally. The alterations in epidermal lipids in atopic eczema result in a defective epidermal barrier and increased loss of water from the stratum corneum. As a result the corneocytes shrink and crack open between them which permit the penetration of irritants and allergens.

In atopic eczema, the imbalance between CD4+ lymphocytes, with predominating TH2 immune response rather than TH1, may play a significant role in the pathogenesis. It was hypothesised that the impaired barrier function of the atopic allows easier penetration of allergens deep into the skin and causes cells to switch to TH2 rather than TH1 immune response.

Emollients and their use in atopic eczema

To improve the barrier function of the atopic skin, dryness can be reduced by using occlusive agents or humectants; the lipid bilayer can be strengthened by using physiological lipids such as ceramides. Petrolatum is a traditional moisturiser, which can permeate between the cells in the stratum corneum and reaches, but not deeper than, the granular layer. A single use of 10% petrolatum can result in 50-60% improvement in barrier properties, which can be sustained for 8 hours.

Apart from occlusive methods such as petrolatum to prevent water loss, humectants can also increase the hydration of the stratum corneum. Examples of humectants include urea, lactic acid/lactates, glycerin, sorbital and PCA. Although urea and lactic acid creams can improve hydration of the skin, higher concentrations do not always give better results. It was found that a 3% urea plus 1.5% lactic acid cream was equally effective as a 10% urea plus 5% lactic acid cream. There seems to be a threshold for maximum benefit, and very high concentrations can cause irritation.

Emollients can have a steroid-sparing effect in atopic eczema. Two groups of children with mild to moderate eczema, showed same improvement when one

group was treated with twice daily 2.5% hydrocortisone and the other group with once daily 2.5% hydrocortisone and once daily emollient.

To have maximum effect, patients with atopic eczema should be treated continually with complete emollient therapy which consists of a combination of an emollient cream/ointment, emollient bath oil and emollient soap substitute with education on how to use them.

The best emollient for an individual patient with eczema is the one they prefer because this is the one they will use regularly. A good compromise between efficacy and cosmetic acceptability is to use a light emollient cream under clothes during the day and a heavier emollient at night. Providing a series of samples for the patient to choose from will often enhance compliance.

Conclusion

The disturbed barrier function of the skin in atopic eczema allows easier penetration of irritants and allergens. The intensive use of emollients improves the control of atopic eczema and potentially reduces the need for topical steroids. However, patient education is important and patients' preference should be taken into account.

Learning points:

The intensive use of emollients is useful in atopic eczema and it is important to ensure patient compliance.