The effect of a humectant emollient cream containing 5% urea compared to a non-humectant emollient on the skin barrier in older people with dry skin

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ABSTRACT

The worldwide prevalence of seniors increases with advancing age, affecting up to 75% of older people. The development of senile conditions, such as atop dermatitis (AD), eczematous eruptions andsenile skin is associated with a skin barrier defect (Figure 1). This defect is characterized by reduced natural moisturizing factor (NMF, comprising sodium pyrrolidone carboxylic acid (PCA), urea and lactic acid etc) and abnormal levels of intercellular lipids (cholesterol, ceramides and free fatty acids) in the stratum corneum (SC). As we age the integrity of the skin barrier declines, and recovery following disruption slows, increasing the skins susceptibility to negative environmental factors.

Emollients are widely used to treat senile, however, there is limited mechanistic evidence of their effects on the skin barrier.

INTRODUCTION

METHODS

21 volunteers over the age of 60 with self-reported dry skin were included (mean age 64 years, range 60-80 years). Each volunteer applied two 2g applications of treatment cream for 28 consecutive days. Each volunteer recorded skin water loss (TEWL) using an Aquameter at baseline and after 8 applications. Skin surface pH and SC hydration were measured using a Skin-ometer (Thermo Electron Corp., Madison, USA). Skin surface pH and SC hydration were measured using a Skin-ometer (Thermo Electron Corp., Madison, USA). Skin surface pH before and 12-20 hours after treatment. *Results of a t-test shown.

RESULTS

1. Treatment with the humectant emollient for 28 days preserves normal skin barrier function in older people with dry skin

2. Treatment with the humectant emollient improved SC integrity compared to untreated skin and skin treated with the non-humectant emollient

3. Reduced SC integrity following treatment with the non-humectant emollient is associated with elevated skin-surface pH and degradable protease activity

4. The humectant emollient significantly hydrated the skin for more than 12 hours after cessation of treatment

5. Treatment with the humectant emollient increases the level of water binding molecules and water in the stratum corneum

6. Treatment with the humectant emollient stimulates endogenous NMF synthesis

CONCLUSIONS

- The humectant emollient significantly hydrated the skin of older people with dry skin to a greater extent and for a longer period of time compared to the non-humectant emollient.
- The humectant emollient significantly elevated SC NMF levels exogenously and endogenously, putatively via increased filaggrin expression.
- Treatment with the humectant emollient for 28 days preserved skin barrier function and improved SC integrity in older people, indicative of skin barrier repair properties.
- This highlights the significant difference in effects of emollients on the skin barrier, and their potential to treat dry skin conditions.

REFERENCES