Efficacy and safety of a sonic skin care brush on Keratosis Pilaris

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Introduction

Keratosis pilaris is a skin condition characterized by tiny, flesh-colored to slightly red bumps commonly occurring on the back of the arms, legs, buttocks, etc. Each tiny bump is a plug of dead skin cells that forms at the site of a hair follicle. The lesions are small, rough, white or red follicular papules or pustules. Keratosis pilaris is estimated to affect 40% of the population at some point in time. The severity varies from individual to individual most predominantly in adolescents but often intermittently persisting in adults. Severity is often seasonal, most predominately occurring in the winter months.

Keratosis pilaris is a benign condition that does not require treatment unless symptoms are severe or lesions become infected. Otherwise, treatment is provided when the condition becomes uncomfortable or affects body image. For some, application of an intensive moisturizer may provide relief. Often, use of mechanical exfoliants or washcloths during bathing or showering followed by an alpha-hydroxy acid or urea moisturizer is required. In extreme cases topical steroids or anti-inflammatory agents are used. Mechanical and chemical exfoliation help control and reduce excessive accumulation of skin cells that clog pores and accumulate at the base of hair follicles. While this protocol is often effective, over-aggressive scrubbing can lead to irritation and infection. Therefore, the type of cleanser and method of cleansing becomes a delicate balance of exfoliation to clear plugged pores while simultaneously maintaining and protecting the skin barrier.

A sonic skin care brush was developed to provide a consistent, effective, gentle method of cleansing. Several studies have reported the sonic brush safe and effective for twice daily cleansing the skin of healthy individuals, and favorably used on the compromised skin of subjects with rosacea, acne, and seborrheic dermatitis. Additionally, the sonic brush is often used to prepare the skin prior to in-office procedures. In the current study, the sonic skin care brush was incorporated into the skin care regimen of subjects with keratosis pilaris to provide a gentle and consistent method of cleansing and to clear accumulated skin cells and plugs. Subjects were additionally provided a skin polish with jojoba beads and a mild 5% lactic acid lotion to aid in exfoliation and hydration.

Objective

To evaluate the changes in keratosis pilaris symptoms on the back of the arms after using the sonic skin care brush, body polish, and 5% lactic acid lotion (pH 4.2) for 12 weeks.

Methods & Materials

The 12 week, 4-visit home use study was conducted to evaluate efficacy and safety of combining a sonic skin care brush having a brush head designed for body cleansing with a body polish and a 5% lactic acid lotion on subjects with keratosis pilaris. The study included 13 subjects (aged 15-60) with mild to moderate keratosis pilaris. All the participants were given a sonic skin care kit (sonic brush, body polish, and lactic acid lotion). They were instructed to cleanse the back of each arm with the sonic brush and body polish for 30 seconds each time they took a bath or shower (at least once per day) for a period of 12 weeks. They were also instructed to apply the lactic acid lotion to the cleansed sites. At each study visit (baseline, 4 week, 8 week, and 12 week), Transepidermal Water Loss (TEWL), Skin Moisture/Hydration, and Erythema were measured on the test sites; photographs were taken; and a questionnaire was filled by study subjects to assess safety and efficacy of the sonic skin care brush protocol.

The TEWL, Hydration, Erythema, and questionnaire data are summarized below.

**Erythema**
The average Erythema measurements reduced after 8 week and 12 week on the right arm (p<0.01 and 0.02, respectively). There was a statistically significant difference (reduction in redness) between baseline and 8 week and 4 week and 8 week for both the right arm (F(3, 24) = 6.355, p<0.0005) and the left arm (F(3, 27) = 11.776, p<0.0005). There was a statistically significant difference (reduction in redness) between 4 week and 12 week on the right arm (p=0.03) and a statistically significant difference (reduction in redness) between baseline and 8 week and 4 week and 8 week on the left arm (p<0.01 and 0.02, respectively). The difference in the right arm average erythema measurements and left arm average erythema measurements at baseline, 4 week, 8 week, and 12 week were non-significant (paired t-test p=0.56, 0.82, 0.44, 0.91, respectively).

Repeated measures ANOVA showed that the mean erythema readings were statistically significantly different for both the right arm (F(3, 24) = 6.355, p<0.0005) and the left arm (F(3, 27) = 11.776, p<0.0005). There was a statistically significant difference (reduction in redness) between 4 week and 12 week on the right arm (p=0.03) and a statistically significant difference (reduction in redness) between baseline and 8 week and 4 week and 8 week on the left arm (p<0.01 and 0.02, respectively).

**Hydration**
Hydration measurements (combined for both left and right arms) showed an overall increase in skin hydration, compared to baseline.

**Subject Perception**
After 12 weeks of use, 100% of subjects perceived the back of their arms looked healthier and felt softer/smoothier. Overall, subjects perceived an improvement in their overall keratosis pilaris skin condition/overall skin condition, skin texture, redness, and dryness (100%, 100%, 92%, and 91%, respectively).

This data correlated with the photographs, which showed improvement in the signs associated with keratosis pilaris over the 12-week period (Figure 4).

Conclusions

In this pilot study, the sonic skin care brush with a brush head designed for body cleansing, body polish, and 5% lactic acid lotion provided a gentle and consistent method of cleansing and protecting areas with KP; resulting in smoother, softer skin with fewer plugged pores.

References

Agache P., Humbert P.; Measuring the Skin; Springer-Verlag, Berlin, Germany 2004; Chapter 55 Transepidermal Water Loss, Gabard B, Treffel P.