

Reduction of “Ashiness” in Skin of Color with a Lipid-rich Moisturizing Body Wash

LI FENG, PhD; STACY HAWKINS, PhD

Unilever Research & Development, Trumbull, Connecticut

ABSTRACT

Objectives: In people with darkly pigmented skin, classified as Fitzpatrick type IV, V, or VI skin, xerosis or dry skin can be associated with a whitish coloring and a reduction in skin shininess known as “ashiness.” The authors investigated whether mild and moisturizing cleansers can repair dry skin in people with type IV, V, or VI skin by improving barrier function and reducing ashiness. **Design:** This study has a balanced, randomized, double-blind monadic design comprising two cells of approximately 30 participants per cell. Participants were randomly assigned to either receive the marketed directly esterified fatty isethionate-based moisturizing body wash or the marketed syndet bar for general bathing purposes for three weeks. **Setting:** A clinical testing facility in Dallas, Texas. **Participants:** Healthy women with visible signs of ashy skin on their lower legs, forearms, and elbows. **Measurements:** Skin assessments were performed at six defined sites and included expert visual grading of dryness, dermatologist grading of ashiness, instrumental measurements, and a self-assessment questionnaire. **Results:** Twenty-seven participants received body wash and 28 participants received the syndet bar. Use of body wash was associated with significant improvement in transepidermal water loss and expert- and self-assessed dryness. Participants reported reduced ashiness at all sites after use of body wash. Similar results were seen with use of the syndet bar. **Conclusion:** In study participants with type IV, V, or VI skin, regular use of the body wash or syndet bar repaired the condition of the skin, improving barrier function and reducing visual dryness. Support of the epidermal barrier by mild and moisturizing cleansers was associated with reduced ashiness. (*J Clin Aesthet Dermatol.* 2011;4(3):41–44.)

People with darkly pigmented skin, or “skin of color,” are becoming a larger proportion of dermatology practices as the population with African or Asian ancestry grows in the United States. Ultraviolet (UV) sensitivity is a scale to classify skin pigmentation, regardless of ethnicity. The most broadly used system is the Fitzpatrick scale, which considers the pigmentation of skin, epidermal appendages, and sensitivity to sun exposure in determination of UV phototypes, ranging from type I (fair white) to type VI (deeply pigmented black). Studies that compare skin types have been inconclusive, potentially due to small study populations, geographic environmental differences, and the anatomic sites of analysis. A few trends have emerged, however, that

suggest some physiological differences associated with skin pigmentation.¹ For example, while all skin phototypes have similar numbers of melanocytes, type IV to V skin tends to have physiological differences in the barrier function of the stratum corneum (SC), the outermost layer of the epidermis. Notably, there is stronger cohesion of the SC and more rapid recovery from barrier damage in type IV to V than type I to II skin.² The SC of darkly pigmented skin tends to have higher transepidermal water loss (TEWL), lower water content, and lower pH.^{1,2}

Xerosis, or dry skin, can be associated with environmental stresses to the SC, including seasonal changes or soap-induced dryness. In darkly pigmented skin, xerosis can lead to a whitish coloring and a reduction in skin shininess known

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ADDRESS CORRESPONDENCE TO: Stacy Hawkins, PhD, Unilever Research & Development, 50 Commerce Drive, Trumbull, Connecticut 06611; E-mail: Stacy.Hawkins@unilever.com

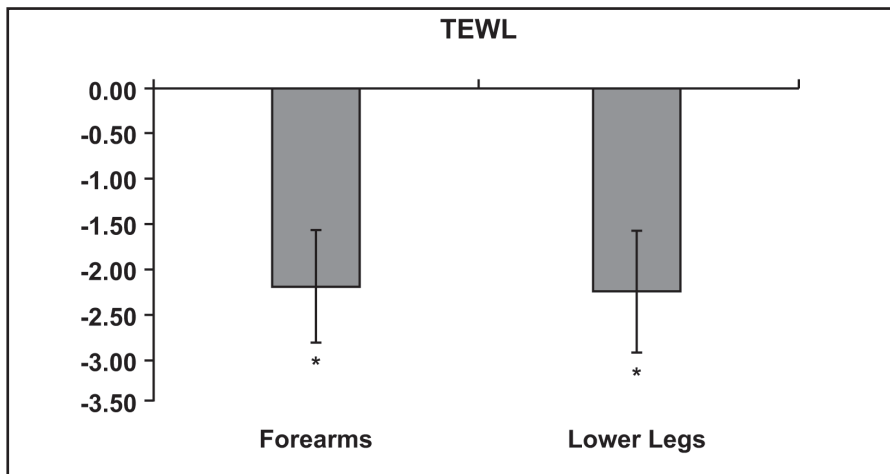


Figure 1. Improvements in TEWL with moisturizing DEFI-based body wash use

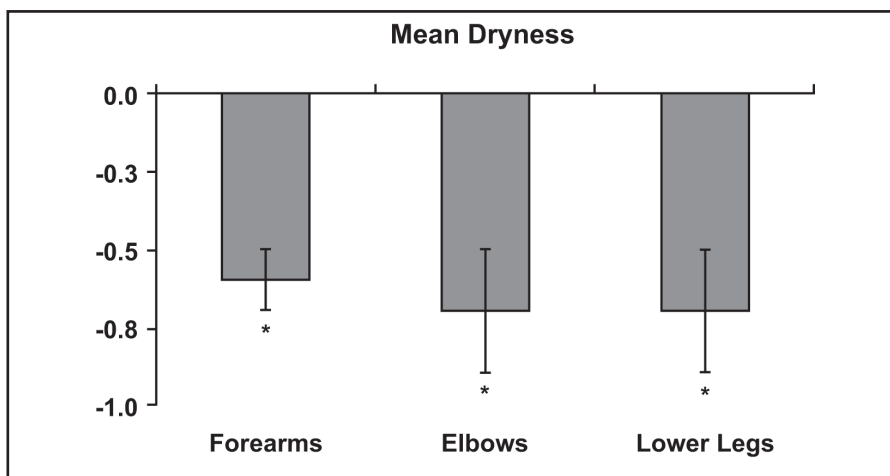


Figure 2. Expert grading of visual dryness with DEFI-based moisturizing body wash use

as “ashiness” or “ashy” skin.³ Ashy skin is different from ashy dermatosis, which is characterized by erythema.³ Analysis by dry dermoscopy, ultraviolet light-enhanced visualization (ULEV) assessment, and cyanoacrylate skin surface stripping (CSSS) xerosis grading documented xerosis in ashy skin, but there was no evidence of inflammation.³ Although not a clinical condition, ashy skin can be distressing and many turn to their dermatologists for guidance on maintaining healthy skin.

Soap-based cleansers are alkaline and can cause extensive dryness and damage to the composition of the SC by the stripping of healthy components or by the intercalation of surfactants into the lipid bilayers.⁴⁻⁷ Mild surfactants, such as sodium cocoyl isethionate or sodium alkyl isethionate, reduce cleanser-based damage to the SC by cleansing at neutral pH and because of a lower charge density. Some moisturizing formulations of mild cleansers re-introduce fatty acids into the lipid bilayer to ameliorate dry lipid bilayers; fatty acids may also act as a “sacrificial lipid” to prevent stripping of the SC during cleansing.⁸ Ananthapadmanabhan et al have previously shown the

benefits of the combination of mild and moisturizing ingredients in reducing dryness in subjects with type I or II skin, leading to visibly improved skin.⁹ In this study, the authors investigated whether mild and moisturizing cleansers under real-life conditions can improve dry skin and ashiness in people with type IV, V, or VI skin.

METHODS

Study design and participant selection. This study has a balanced, randomized, double-blind monadic design comprising two cells of approximately 30 subjects per cell. Healthy women with visible signs of ashy skin on their lower legs, forearms, and elbows were eligible.

Inclusion/exclusion criteria. Inclusion criteria specified enrollment of African-American and Indian (Asian) descent with Fitzpatrick skin type IV, V, or VI between the ages of 18 and 65 years and with slight-to-moderate dryness (1.0–4.0 on predetermined scale of qualification) on left and right elbows, forearms, and lower outer legs.

Participants were excluded from the study if they had a prior history of allergies or sensitivities to soaps, personal wash products, or fragrances. Exclusion criteria also prevented enrollment of participants with conditions or factors that the investigator believed may affect the

response of the skin or the interpretation of test results. The study was approved by an independent ethical review board, and informed consent forms were obtained from all participants.

Product application protocols. Participants were randomly assigned to receive either the marketed directly esterified fatty isethionate (DEFI)-based moisturizing body wash or the marketed syndet bar. Participants agreed to only use test products for general bathing throughout the duration of the study. Participants bathed once per day or more if additional showers or baths were required because of exercise. No other skin care products (e.g., creams, moisturizers) were permitted during the study.

Clinical assessments. After Visit 1 (T=-1 week), a one-week conditioning phase occurred prior to test product application, during which participants used the conditioning phase product (Ivory[®] Soap Classic/non-fragranced) and discontinued use of all moisturizing products. During Visit 2 (baseline; T=0 week), patient skin was assessed, and the participants received the self-perception questionnaire and the test product. During

Visit 3 (T=3 weeks), all assessments were repeated and a self-perception questionnaire was completed.

Skin assessments were performed at six defined sites, one each on the lower legs, the elbows, and the forearms. Skin assessments included expert visual grading of dryness, dermatologist grading of ashiness, photography, and instrumental measurements (Corneometer, Skicon, and TEWL; performed at lower leg and forearm sites).

Statistical analysis. For visual assessments, a nonparametric Wilcoxon signed-rank test was used. For instrumental measures, an average across replicate measurements was performed and a paired-test compared post-treatment measurements with measurements at baseline. Assessments on left and right limbs were averaged.

RESULTS

Study population. Fifty-five participants were enrolled in this study; 27 received the DEFI-based moisturizing body wash, and 28 received the syndet bar. The mean age was 39.5 (range, 26–60) and 41.9 (range, 18–59) for participants receiving DEFI-based moisturizing body wash and syndet bar, respectively. The proportion of participants with Fitzpatrick skin types IV, V, and VI were 41, 33, and 26 percent in the DEFI-based moisturizing body wash group and 28.5, 43, and 28.5 percent in the syndet bar group, respectively.

Improvements in TEWL. Baseline TEWL measurements were compared with measurements on the forearms and lower legs after the three-week cleansing regimen. Significant improvements in mean change from baseline TEWL were observed with the DEFI-based moisturizing body wash on both limbs (Figure 1). The mean change from baseline TEWL was -2.2 and -2.3 on the dorsal forearms and lower legs, respectively. Improvement in TEWL with use of the DEFI-based moisturizing body wash is consistent with previous studies.⁹ Syndet bar use was also associated with significantly improved mean change from baseline TEWL at both sites (data not shown).

Expert grading of visual dryness. Clinical assessment of visual changes in dryness from baseline was performed on the elbows, forearms, and lower legs. Grading of dryness by trained technicians was performed on qualified scales for arms and legs. The mean change from baseline after three weeks of cleansing with DEFI-based moisturizing body wash was significantly improved at all sites; -0.7 at the elbow, -0.6 at the forearm, and -0.7 at the lower leg, respectively (Figure

TABLE 1. Improvements in self-assessed skin condition with use of DEFI-based moisturizing body wash

IMPROVEMENTS IN SKIN CONDITION		
	Mean Change	Significance
REDUCTION IN ASHINESS		
Forearms	-1.2±0.4	P=0.003
Elbows	-0.9±0.4	P=0.027
Lower leg	-1.2±0.5	P=0.023
INCREASE IN SOFTNESS		
Forearms	1.2±0.3	P=0.001
Elbows	1.2±0.4	P=0.003
Lower leg	0.6±0.3	P=0.040
INCREASE IN SMOOTHNESS		
Forearms	0.9±0.3	P=0.013
Elbows	0.7±0.3	P=0.032
Lower leg	0.5±0.4	—

2). Improvement in skin dryness with use of the DEFI-based moisturizing body wash is consistent with previous studies.⁹ Similar results were seen with the syndet bar at the elbow and forearm sites (data not shown).

Improvements in self-assessed skin condition. Before and after the three-week cleansing regimen, all participants completed a self-perception questionnaire to record self-assessments of ashiness, dryness, and skin texture on the elbows, forearms, and legs. Comparison of baseline and post-regimen assessments revealed significant mean improvement in ashiness and skin softness at all sites with use of DEFI-based moisturizing body wash (Table 1). Smoothness at the elbows and forearms also significantly improved with use of DEFI-based moisturizing wash. Self assessments of smoothness and softness after the three-week regimen with syndet bar found significant improvement on forearms, elbows, and the lower legs (data not shown).

CONCLUSION

Improvements in skin condition with real-world use of the DEFI-based moisturizing body wash and syndet bar by participants with type IV, V, or VI skin were similar to those seen in a study primarily composed of participants with type I or II skin.⁹ These mild and moisturizing cleansers introduce fatty acids into dry lipid bilayers,

improving skin texture and condition.¹⁰ In this study, benefits were seen with the exclusive use of both the DEFI-based moisturizing body wash and the syndet bar for the care of dry and ashy skin in participants with type IV, V, or VI skin. The reduction in TEWL over the three-week cleansing regimen indicates increased barrier function, which was further supported by the clinical- and self-assessment of dryness.

The mechanism of ashiness is not well understood, and consequently the best practices for managing the condition have not been determined. Seasonal changes in temperature and humidity can be a trigger for ashiness.³ Ashy skin may also be associated with inefficient corneodesmolysis and desquamation, as the expression of some serine proteases and cathepsins are expressed at lower levels in darkly pigmented skin.¹¹ Because of underlying dryness, many people with ashy skin tend to use moisturizing lotions to rehydrate skin and reduce ashiness.

The clinical and self-assessments of ashiness reported here indicate that mild and moisturizing cleansers can be valuable tools in the reduction of ashiness, even in the absence of moisturizing lotion use. Although self-assessments indicated an improvement in ashiness at all sites, the clinical assessment reported a significant reduction in ashiness at the elbows, but not the forearms and lower legs. A possible explanation for these different reports may be that the clinical examination was primarily visual, while the participants may have included tactile assessment. As reported previously,⁹ regular use of the DEFI-based moisturizing body wash and syndet bar repaired the condition of the skin, improving barrier function and reducing visual dryness. In participants with type IV, V, or VI skin, this support of the epidermal barrier by mild and moisturizing cleansing products was associated with reduced ashiness. Further studies in the physiology of type IV, V, or VI skin and the underlying causes of ashiness may inform the development of cleansing formulations to maintain the barrier health of darkly pigmented skin.

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