Clinical Images and Case Reports Journal

Case Report | Vol 3 Iss 5

Facial Mask Moisturization Study: Case Report

Isabel Diaz, BA[1], Wendy Chan[2], Melissa Gerwitz[3], Giorgiana Giancola[4] and Alison Adams-Woodford[5*]

[1]Dermal Clinical Research, Colgate-Palmolive Company, Piscataway, NJ, USA

[2]Clinical Research Manager, BASF Tarrytown Consumer Testing Center, Performance and Claims, Care Chemicals, USA

[3]Clinical Scientist, BASF Tarrytown Consumer Testing Center, Performance and Claims, Care Chemicals, USA

[4]Scientific Affairs, Colgate-Palmolive Company, Piscataway, NJ, USA

[5]R&D and Communications, Physicians Care Alliance (PCA) Skin, Scottsdale, AZ, USA

[*]**Corresponding author:** Alison Adams-Woodford, R&D and Communications, Physicians Care Alliance (PCA) Skin, Scottsdale, AZ, USA, E-mail: aadams@pcaskin.com

Received: May 14, 2021; **Accepted:** May 20, 2021; **Published:** June 05, 2021

Abstract

In an attempt to overcome the physiological and visible signs of facial aging, scientists and formulators diligently work to elucidate strategies for its intervention. It has been demonstrated that the natural slowing in the production of endogenous glycosaminoglycans, hyaluronic acid (HA) in particular, leads to an acceleration in cutaneous aging [1]. Additionally, the normal stratum corneum or barrier function that is key to proper moisture retention tends to worsen with age in some ethnic groups [2-6]. Hyaluronic acid is one of the naturally occurring glycosaminoglycans in human skin that shows an impressive ability to bind to and hold 1000 times its weight in moisture within the skin [7]. It is therefore a logical strategy to develop products to deliver essential hyaluronic acid into the skin to mitigate the negative effects of a loss of HA in dry and aging skin. The PCA SKIN Hyaluronic Acid Overnight Mask, a combination of HA of varying molecular weights, was tested for efficacy in-vivo for both immediate and eight hours moisture increase in human skin.

Keywords: Hyaluronic acid; Aging skin; Moisture mapping; Moisturization; Corneometer; Facial mask

Introduction

A clinical study was conducted to test the efficacy of a newly developed facial mask in delivering HA into the skin to immediately increase and also maintain moisture levels over an eight-hour period. Two groups were recruited; one for split face, the other full face application. A diverse range of skin types and Fitzpatrick types were included in the study. Moisturization efficacy was evaluated using facial mapping and bioinstrumentation at multiple points as well as through participant self-perception questionnaires at the completion of the study.

Case Presentation

To evaluate the efficacy of the PCA SKIN® Hyaluronic Acid Overnight Mask, a topically applied hyaluronic acid facial mask, two groups of participants were recruited. Group one, considered the mapping group, was composed of female subjects ages 18 to 65 with an n=6. Group two, considered the non-mapping group, consisted of female subjects between 18 and 65 years old with an n=26. All participants were subject to standard inclusion and exclusion criteria.

The moisture measurements were acquired through the use of the Corneometer® (Courage Khazaka CM825) device. The Corneometer® measures the capacitance of the skin over a 10-20 μm thickness of the stratum corneum which then correlates to the water content. The spring in the probe head ensures constant pressure on the skin to enable consistent measurements. The value recorded is expressed in arbitrary Corneometer® Units which represents the change in skin capacitance.

The mapping group underwent an assessment of a full-face application of the test product. Readings were taken on 60 evenly spaced points over both sides of the face with the Corneometer® device.

The non-mapping group test was randomized and blinded. This group was split-face, with the test product being applied to the right or left half of the face (randomly assigned) and the other side of the face was left untreated. A total of five (5) Corneometer® measurements were taken on both the left and right sides of the face, the same location on the participant's cheek being measured at each timepoint with an average calculated for each side.

For both the mapping and non-mapping groups, Corneometer® readings were taken as a metric of inclusion in the study. All participants were required to have Corneometer® values under fifty (50) on both sides of the face at baseline for inclusion in the study. At baseline, the Corneometer® readings were taken and the test product was applied: full face and split face, respectively. Subsequent Corneometer® readings were taken at the eight-hour time point as an evaluation of test product efficacy.

The self-perception questionnaire was also completed by each participant at completion of the study, after the eight-hour readings. This questionnaire measured perceived product performance and the outcomes the participants identified in their own skin after use. The aggregate responses were assessed to determine statistical significance.

Discussion

Used on the mapping group, Moisture Mapping technology utilizes the Corneometer® value range of 0-90 to illustrate the moisture content in the skin. This technology identifies low moisture areas in the 1-49 range demonstrated with orange and red coloration, while the areas of high moisture in the 50-90 Corneometer® value range are represented with light and dark blues, dark blue being the visual indication of highest moisture content. This unique testing procedure provides a dramatic visual indication of an increase in moisture (Figure 1). All participants in the mapping group showed a significant increase in moisture content as generated with the Moisture Mapping technology. This is evident by the eight-hour images that are predominantly blue in color falling in the 55-90 Corneometer® value range demonstrating a visible increase in facial moisture and long-lasting facial moisture after only one application.

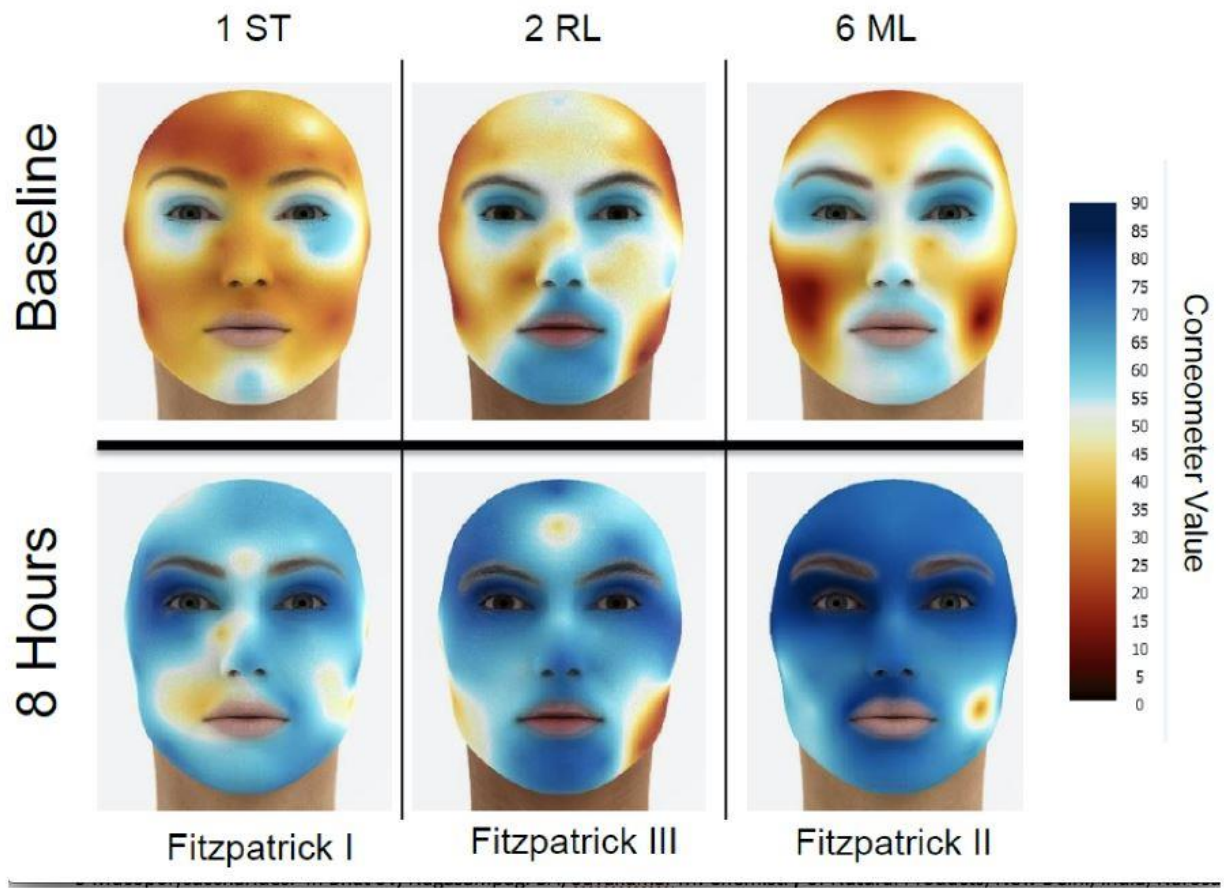

Figure 1: Facial moisture mapping illustrative images, mapping group.

The outcome of the non-mapping group test demonstrated a statistically significant increase in moisture content ($p<0.001$) of 75% in comparison to the baseline readings eight hours after test product application as well as a 32% increase ($p<0.05$) as compared to the untreated side eight hours after application (Figure 2). The percent change for facial skin moisture over an 8 hour period for the untreated side are slightly higher than expected however no anomalies were noted during the study. This demonstrable eight-hour, long-lasting moisturization was identified through Corneometer® readings as well as participant perception. The Corneometer® results were consistent with the moisture map results demonstrating 8-hour moisture retention after one application.

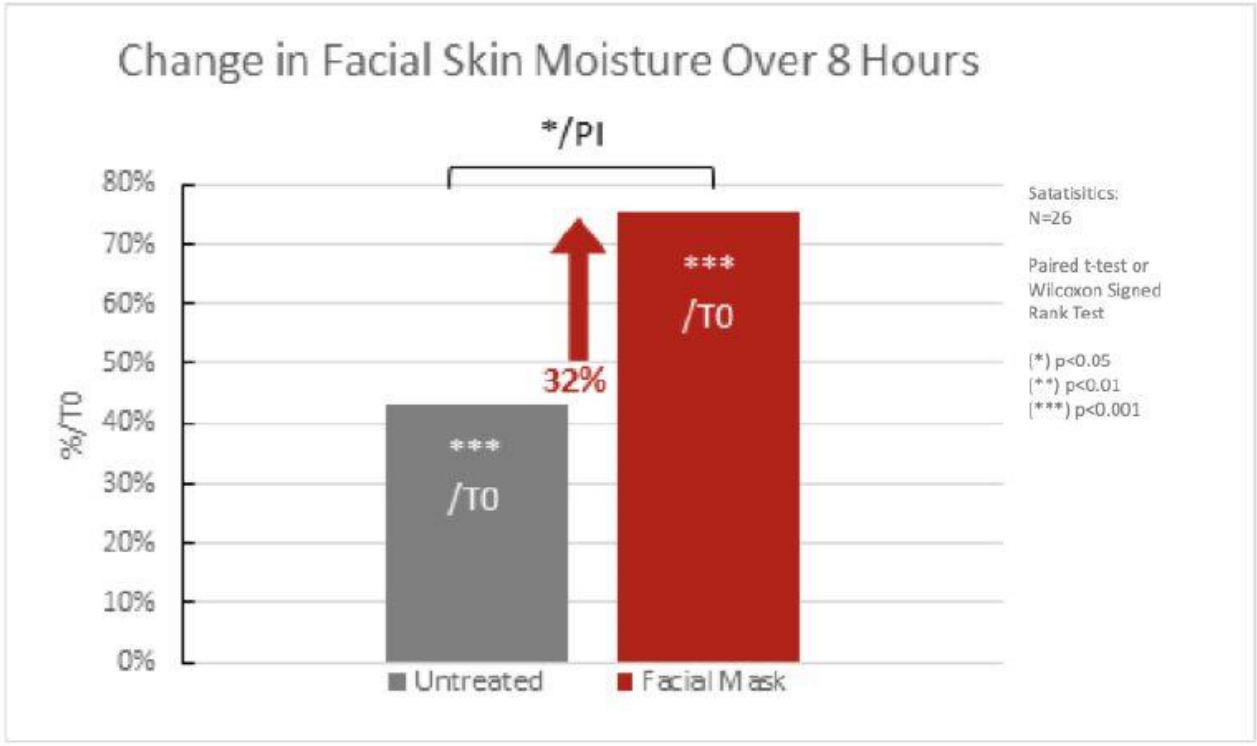

Figure 2: Change in skin moisture over time, non-mapping group.

All members of the mapping and non-mapping groups logged their participant perceptions of their skin after the use of the test product. The responses were catalogued in the self-perceived product efficacy questionnaire. The aggregated responses to the questions show significantly positive responses to the test product. The responses demonstrated that a highly significant majority ($p<0.01$) of the participants stated that the test product not only felt nourishing to their skin (94%) but also left it feeling smooth (88%). Additionally, a significant majority also felt that the test product left their skin looking radiant (72%).

In addition, during the course of the study, there was no evidence of product irritation visually observed by clinical staff or discomfort reported by participants, demonstrating product tolerability. One participant reported an adverse event (not product related).

Statistical Analysis

Statistical analysis was performed on the raw data for all subjects at all time points for each measurement. The following statistics were reviewed: average, standard deviation of the sample (SD) and standard error of the sample (SEM).

For the non-mapping group, all data has been analyzed to confirm the normality of the distribution using the Shapiro-Wilk Test. The following tests were also used to compare the change in parameters:

- For those comparisons where the normality of both data sets was validated, a paired test was used.
- If there was no validation of the normality, then the Wilcoxon Signed Rank Test was used.

No statistical analysis was performed on mapping group data.

Conclusion

This study demonstrated that eight hours after application of the test product, PCA SKIN® Hyaluronic Acid Overnight Mask, a significant increase in facial skin moisturization was observed as compared to both baseline and untreated skin. The application of the HA facial mask also showed visible differences as compared to baseline in facial moisture maps generated at eight hours after application. In addition, subjects perceived the facial mask as being nourishing to their skin while also providing a smooth feel and radiant appearance. These results demonstrate the eight-hour facial moisturization efficacy of the HA facial mask.

Author's Acknowledgements

1. Joanna Wu, PhD, Early Research, Colgate-Palmolive, Piscataway, NJ, USA
2. Amber Leigh Hubschmitt, Consumer Scientist, BASF Tarrytown Consumer Testing Center, Performance and Claims, Care Chemicals, USA

Funding: This research was funded by the BASF corporation.

Disclosure

Diaz I and Giancola G are employed by the Colgate-Palmolive Company.

Chan W and Gerwitz M are employed by the BASF Corporation.

Woodford AA is employed by PCA SKIN®.

REFERENCES

1. Ghersetich I, Lotti T. Hyaluronic acid in cutaneous intrinsic aging. Int J Dermatol. 1994; 33: 119-122.
2. Verdier-Sevrain S, Bonte F. Skin hydration: A review on its molecular mechanisms. J Cosmet Dermatol. 2007; 6: 75-82.
3. Firooz A. Variation of biophysical parameters of the skin with age, gender, and body region. Scientific World J. 2012; 2012: 386-936.
4. Shlivko IL. Complex assessment of age-specific morpho functional features of skin of different anatomic localizations. Skin Res Technol. 2013; 19: 85-92.
5. Lanctin M. Changes on body skin as a function of age. J Am Acad Dermatol. 2009; 60: 1.
6. Mehta HH, Nikam VV, Jaiswal CR, et al. A cross-sectional study of variations in the biophysical parameters of skin among healthy volunteers. Indian J Dermatol Venereol Leprol. 2018; 84: 521.
7. Baumann L. Skin ageing and its treatment. J Pathol. 2007; 211: 241-251.