A Multi-Functional Anti-Aging Moisturizer Positively Influences the Facial Skin Microbial Diversity on Female Subjects

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Introduction of research

A delicate balance exists among the skin microbiome and the health of the skin. Imbalanced and reduced diversity is associated with skin disorders such as psoriasis, dandruff, dry skin, and skin aging.[1,2] Studies have shown a shift in microbial diversity and balance in facial microbiota in aging skin.[1] Intrinsic and extrinsic factors cause detrimental effects on the dermal-epidermal junction (DEJ), such as weakening the structural integrity and impairing crosstalk between the epidermis and dermis, ultimately leading to subpar skin barrier functioning.[5] Intrinsic and extrinsic factors particularly negatively influence the skin microbiota diversity and balance. [3,4] Skincare products that claim to rebalance and diversify the skin's microbiome to a healthy state, especially in aging skin, will offer patients further benefits for long-term skin health.

The maintenance of the balance of the skin microbiome together with the DEJ is an essential component for skin health. Thus, a novel multi-functional anti-aging moisturizer (MFM) was formulated at skin neutral pH (4.5 – 5.5) with prebiotic and postbiotic technology. Additionally, the MFM was formulated to treat global facial skin aging by targeting the DEJ [6] and the skin microbiome to achieve long-term skin health. In a standalone clinical efficacy and tolerability study, forty-two female subjects between 35 to 65 years old with moderate photodamage demonstrated improvement in skin firmness and global facial fine lines and wrinkles after 12-weeks of twice daily application. Transepidermal water loss (TEWL) and triplicate skin pH measurements performed on subjects' left cheek at baseline and week 12 revealed a statistically significant improvement in TEWL, while the pH remained within skin neutral pH of 4.5 – 5.5. This study demonstrated tolerability with an improvement in overall skin health.[6]

Objective and Methods

The present clinical case study set out to evaluate the effect of a skincare regimen treatment including a gentle cleansing lotion, the MFM, and a basic sunscreen on aged facial skin microbiome composition in healthy female subjects with twice daily use for 28 days. The intent was to determine if there was a relationship between the facial microbiome and the MFM in shifting the skin microbiome to a healthy, balanced, and diversified state.

The study protocol was in accordance with the EU Scientific Committee on Consumer Safety (SCCS) guidance and met all international standards. Twenty-five female subjects between 35 to 65 years old with Fitzpatrick skin types I – VI, moderate crow's feet wrinkles and global face photodamage using a 10-point modified Griffith's scale were enrolled into a single center, open label clinical study. The study took place in Valencia, Spain during the summer months from July to August 2021. Subjects' right and left cheek and forehead were swabbed for microbial skin samples. The extracted microbial DNA was used as a

template for PCR amplification of seven hypervariable regions of the 16S bacterial gene (V2-4-8 and V-36.7-9). [7] Microbial diversity analysis and clinical photography were performed at baseline and day 28. Self-assessment questionnaires were performed at day 28. Statistical analysis of bacterial species was performed utilizing classical univariate analysis via t-tests and ANOVA and ranked by their false-discovery rate adjusted p values. Statistical significance was achieved at $p < 0.05$. Additionally, the Shannon index was investigated by clustering the data into three age groups – premenopausal, menopausal, and postmenopausal.

Results:

The skincare regimen, including a gentle cleansing lotion, an MFM, and a basic sunscreen, improved microbial facial skin diversity and shifted the microbiota composition after 28 days of twice daily use when compared to baseline. The skincare regimen was well tolerated by subjects, where no adverse events or cutaneous reactions were reported throughout the duration of the study. The self-assessment questionnaire revealed an overall acceptance of 88% after 28 days with twice daily use of the MFM. An improvement in overall skin health was demonstrated after 28 days. This data was further supported by visual improvements in overall skin health demonstrated by clinical photography.

Conclusion

After 28-days, the skincare regimen treatment shifted the distribution of the facial skin microbiome, positively influencing the skin microbiome to promote long term skin health and protect skin from further aging. These results suggest that the inclusion of prebiotics and postbiotics into a multi-functional anti-aging facial moisturizer can optimally improve the diversity and balance of the facial skin microbiome, while simultaneously providing anti-aging benefits. A simple, yet highly efficacious skincare regimen incorporated into a consumer's daily routine provides the opportunity to balance and diversify the facial skin microbiome to achieve overall long-term skin health when used twice daily for 28 days.

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About the speaker

Sofia Iglesia, MS is Scientist in the Research and Clinical Development Department at Revision Skincare. She is responsible in leading and supporting new product development projects, research new technologies, and assist in clinical study design. She has experience at Emilia Resources LLC, where she was responsible in the formulation of cosmetic and OTC skincare products and ensuring successful scale-up in manufacturing. Additionally, Sofia has clinical research experience performed at the Department of General Internal Medicine and the Department of Dermatology and Cutaneous Surgery, at the University of Miami Miller School of Medicine. Sofia earned a Master of Science in Skin Biology and Dermatological Sciences in May 2020 at the University of Miami Miller School of Medicine and holds a Bachelor of Science in Biology from Florida International University.