Significantly Enhanced Improvement in Dryness, Roughness, Fine Lines and Radiance Following Daily Use of a Novel Multi-Weight Hyaluronic Acid Plus Antioxidant Complex-Based Lotion Compared to a Single-Weight HA Plus Ceramide-Based Lotion

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Abstract

Introduction: Hyaluronic acid (HA) has become a commonly used ingredient in many topical moisturizing products due to its strong humectant properties and essential role in skin hydration; however, limitations of delivery of HA to only the surface of skin has hindered leveraging the full capacity of HA biology necessary for skin rejuvenation. Here we describe the head-to-head clinical comparison of a novel multi-weight HA plus antioxidant complex-based lotion with SPF 30 and a single-weight HA plus ceramide-based lotion with SPF 30 for clinical efficacy on dryness, roughness, fine facial lines, and radiance following daily use.

Methods: A double-blind comparative study was conducted on 70 female subjects (n=35, multi-weight HA plus antioxidant complex-based lotion with SPF 30; n=35, single-weight HA plus ceramide-based lotion with SPF 30) ages 25 to 65 years with mild to moderate facial dryness and visible fine lines and wrinkles, including subjects with Fitzpatrick Skin Types I-VI, with 20% having Fitzpatrick Skin Types V-VI. Clinical grading of the face including dryness, roughness, and fine lines were assessed at baseline, 30 minutes, 2 weeks, 4 weeks, and 8 weeks after once daily application in the morning. Visible, cross-polarized (X-Pol), parallel-polarized (P-Pol) and UV fluorescence clinical images were acquired for each time point. X-Pol and P-Pol images were used to quantify skin radiance.

Results: Daily use of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 demonstrated significant improvements in all clinical grading assessments of dryness, roughness, and fine lines as early as Week 2 compared to baseline. Improvements in visible dryness (Week 2), roughness (Week 2), and fine lines (Week 8) were greater for the multi-weight HA plus antioxidant complex-based lotion with SPF 30 compared to the single-weight HA plus ceramide-based lotion with SPF 30, with overall statistical significance across all three parameters assessed favoring the multi-weight HA plus antioxidant complex-based lotion with SPF 30. For radiance, daily use of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 demonstrated significant increase in radiance at Week 4 compared with baseline, while the single-weight HA plus ceramide-based lotion did not show any improvement in skin radiance compared with baseline.

Conclusion: The marked improvements in dryness, roughness, fine lines, and radiance following daily utilization of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 may be attributed to the inherent properties of HA. These improvements may be further attributed to the ability of multi-weight HAs to moisturize the skin surface and penetrate the upper surface layers of the skin, combined with the added benefits of key antioxidants, including glycine saponin and glycyrrhetinic acid, which have been previously shown to induce endogenous HA synthesis and inhibit endogenous hyaluronidase activity *in vitro*, respectively.

Materials and Methods

Hyaluronic Acid-based Facial Lotions:

1. Multi-weight HA plus Antioxidant Complex-based Lotion with SPF 30 (Eucerin Face Immersive Hydration Daily Lotion SPF 30)
2. Single-weight HA plus Ceramide-based Lotion with SPF 30 (CeraVe AM Facial Moisturizing Lotion SPF 30)

Study Design: Multi-Weight HA Plus Antioxidant Complex-based Lotion with SPF 30 and Single-Weight HA Plus Ceramide-based Lotion with SPF 30

A double-blind comparative study was conducted on 70 female subjects (n=35, multi-weight HA plus antioxidant complex-based lotion with SPF 30; n=35, single-weight HA plus ceramide-based lotion with SPF 30) ages 25 to 65 years with mild to moderate facial dryness and visible fine lines and wrinkles, including subjects with Fitzpatrick Skin Types I-VI, with 20% having Fitzpatrick Skin Types V-VI. Clinical grading of the face including dryness, roughness, and fine lines were assessed at baseline, 30 minutes, 2 weeks, 4 weeks, and 8 weeks after once daily application in the morning. Visible, cross-polarized (X-Pol), parallel-polarized (P-Pol) and UV fluorescence clinical images were acquired for each time point. X-Pol and P-Pol images were used to quantify skin radiance. Briefly, facial images were computer analyzed in terms of their image histogram parameters. A partial least squares regression model was then employed to quantify perceived radiance as a balance of skin surface and subsurface reflection components.

Results

FIGURE 1. Clinical Grading of Dryness, Roughness, and Fine Lines (Week 2)

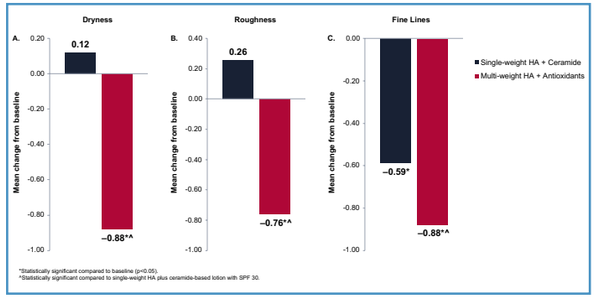

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FIGURE 2. Clinical Grading of Dryness, Roughness, and Fine Lines (Week 4)

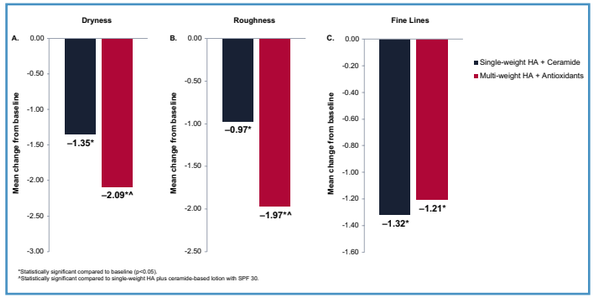

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FIGURE 3. Clinical Grading of Dryness, Roughness, and Fine Lines (Week 8)

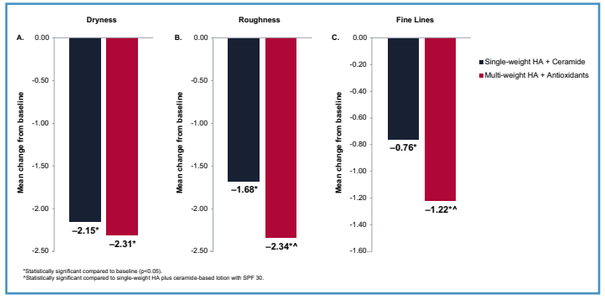

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FIGURE 4. Clinical Evaluation and Assessment of Skin Radiance

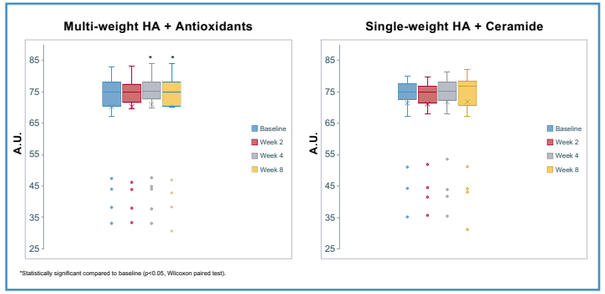

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FIGURE 5. Multi-weight HA plus Antioxidant Complex-Based Lotion with SPF 30 (Week 4)

Study Design. A double-blind comparative study was conducted on 70 female subjects (n=35, multi-weight HA plus antioxidant complex-based lotion with SPF 30; n=35, single-weight HA plus ceramide-based lotion with SPF 30) ages 25 to 65 years with mild to moderate facial dryness and visible fine lines and wrinkles, including subjects with Fitzpatrick Skin Types I-VI, with 20% having Fitzpatrick Skin Types V-VI. Visible, cross-polarized (X-Pol), parallel-polarized (P-Pol) and UV fluorescence clinical images were acquired for each time point. X-Pol and P-Pol images were used to quantify skin radiance.

Summary and Conclusions

- Many studies have shown that utilization of topically applied HA reduces some signs of skin aging; however, in most studies, moisturization is designated only to the surface of the epidermis due to the limited permeability of high molecular weight (HMW) HA. In order to deliver HA to the lower regions of the epidermis, where HA can both increase moisturization and turgor, the size of HA must be either reduced to low molecular weight (LMW) or attached to a permeable carrier
- Studies have shown that HMW HA hydrates the skin by creating a protective film on the surface that helps retain water, while LMW HA penetrates into the epidermal layer to moisturize the stratum corneum, creating a consistent epidermal texture
- This study describes the head-to-head clinical evaluation of two HA day lotions, one a multi-weight HA plus antioxidant-based lotion and the other a single-weight HA plus ceramide-based lotion, applied daily for 8 weeks, with clinical grading of dryness, roughness, fine lines, and radiance at baseline, Week 2, Week 4 and Week 8
- Daily use of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 demonstrated significant improvements in all clinical grading assessments of dryness, roughness, and fine lines as early as Week 2 compared to baseline. Improvements in visible dryness (Week 2), roughness (Week 2), and fine lines (Week 8) were greater for the multi-weight HA plus antioxidant complex-based lotion with SPF 30 compared to the single-weight HA plus ceramide-based lotion with SPF 30, with overall statistical significance across all three parameters assessed favoring the multi-weight HA plus antioxidant complex-based lotion with SPF 30
- For radiance, daily use of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 demonstrated significant increase in radiance at Week 4 compared with baseline, while the single-weight HA plus ceramide-based lotion did not show any improvement in skin radiance compared with baseline
- The marked improvements in dryness, roughness, fine lines, and radiance following daily utilization of the multi-weight HA plus antioxidant complex-based lotion with SPF 30 may be attributed to the inherent properties of HA. These improvements may be further attributed to the ability of multi-weight HAs to moisturize the skin surface and penetrate the upper surface layers of the skin, combined with the added benefits of key antioxidants, including glycine saponin and glycyrrhetinic acid

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