

Thesis Title The Efficacy of 2% Copper Peptide Serum for Eyebrow Hypotrichosis: A Randomized, Double-blind, Vehicle-controlled, Split-face Comparative Study

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ABSTRACT

Background: Eyebrows are essential for protecting the eyes and play a vital role in facial aesthetics, expression, and personal identity. Eyebrow hypotrichosis, characterized by sparse or thinning eyebrow hair, may result from aging, genetic predisposition, over-plucking, or medical conditions, and can negatively affect self-confidence and social interactions. Current options, including cosmetic procedures such as microblading and topical medications, have limitations, highlighting the need for more effective and non-invasive approaches. Copper peptides, particularly glycyl-L-histidyl-L-lysine copper complex (GHK-Cu), have demonstrated wound-healing, anti-inflammatory, and hair growth-promoting properties. However, the efficacy of topical copper peptide (GHK-Cu) formulations for eyebrow hypotrichosis has not been well established.

Objective: This study aims to evaluate the efficacy of 2% copper peptide (GHK-Cu) serum in increasing eyebrow hair density in individuals with eyebrow hypotrichosis.

Materials and Methods: A randomized, double-blind, placebo-controlled, split-face clinical trial was conducted with 18 participants aged 18–40 years. Each participant applied 2% copper peptide (GHK-Cu) serum to one eyebrow and a placebo serum to the other twice daily for 12 weeks. The application side was randomized, and neither the participants nor the investigators were aware of the allocation. Primary outcomes included eyebrow hair count and hair diameter measured using the Visioscan® VC 20plus. Secondary outcomes included eyebrow density assessed by global photographic evaluation by three independent medical doctors using standardized photographs

captured with the VISIA® Skin Analysis System, participant satisfaction, and adverse effects monitored through questionnaires.

Results: The GHK-Cu serum-treated side demonstrated a statistically significant increase in eyebrow hair count and diameter compared with the placebo side, particularly at week 12. Hair count significantly increased on the treated side at week 12 compared with baseline ($p = 0.005$), week 4 ($p = 0.003$), and week 8 ($p = 0.030$), while no significant changes were observed on the placebo side. Hair diameter also showed a significant increase at week 12 compared with baseline ($p = 0.040$). Global photographic assessment scores were significantly higher on the GHK-Cu-treated side at weeks 4, 8, and 12 ($p < 0.05$). Patient satisfaction scores were consistently higher on the treated side, with a significant difference observed at week 12. No serious adverse effects were reported.

Conclusion: Topical 2% copper peptide (GHK-Cu) serum demonstrated significant efficacy in improving eyebrow hair count, diameter, and overall density compared with placebo. The treatment was well tolerated and associated with high participant satisfaction, suggesting that 2% GHK-Cu serum may serve as a safe and effective non-invasive option for enhancing eyebrow hair growth in individuals with eyebrow hypotrichosis.

Keywords: Eyebrow Hypotrichosis, Copper Peptide (GHK-Cu), Eyebrow Hair Growth, Split-face Study, Randomized Controlled Trial, Topical Serum