Biphasic modulated pulsed microcurrent treatment of skin

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INTRODUCTION

Application of low level AC or DC current to the skin to assist drug delivery, reduce pain, affect muscle contraction, and accelerate bone and chronic wound healing[1,2] have been used medically since 1830 when Carlo Matteucci reported injured tissue generated an electric current.[3] In the early 1970s, skin aestheticians incorporated microcurrent treatment into their product offerings, claiming improvement in the appearance of the skin. To investigate possible cosmetic benefits from microcurrent therapy applied to the skin, a home use device delivering 40uA/cm2 in the form of a biphasic modulated pulsed waveform was created and used with an inert electrically conductive gel in an IRB approved 8-week clinical study. Forty female subjects, 25–40 years of age and Fitzpatrick I–IV, were enrolled and evaluated instrumentally as well as by clinical expert graders using a clinical scoring range of 1 (low) to 9 (high). Use of a conductive gel only was compared to application of the microcurrent device with conductive gel, and improvement was seen immediately in numerous skin attributes and progressed over time as observed after 8 weeks of treatment. Depending on the specific attribute, generally one or more full grade changes were seen for overall hyperpigmentation, skin tone evenness, fine lines, and pores. The biphasic modulated pulsed microcurrent treatment provides skin benefit by changing the resistivity of the skin due to structural changes, potentially enhancing the regeneration of collagen and resulting in improvement of overall skin quality.

OBJECTIVE

To assess the anti-aging efficacy of an electrical stimulation device with microcurrent attachment when used with conductive gel.

CLINICAL STUDY DESIGN

A clinical study with a split face design was conducted in which all subjects applied the conductive gel followed by device application on one randomized side of the face, and conductive gel only on the other side. Forty female subjects between ages 25 and 40 and Fitzpatrick I–IV were enrolled for the study. During the visit, subjects acclimated at least 15 minutes in an environmentally controlled room. On the baseline visit, subjects were trained on the usage for the device and administered it at home during the course of the study. Facial skin attributes of all subjects were evaluated at baseline (untreated), immediately post-application, and at weeks 1, 2, 4, and 8 for the following parameters: overall hyperpigmentation, skin tone evenness, radiance, texture, fine lines, and sagging. Instrumental evaluations were performed with Cutometer, Corneometer, and Chromameter for measurement of skin elasticity, skin texture, and improvement of skin tone and radiance respectively. No adverse effects or reactions of any kind were observed on any of the subjects. The study protocol was reviewed and approved by IRB prior to initiation.

RESULTS

Instrumental assessment of facial skin attributes

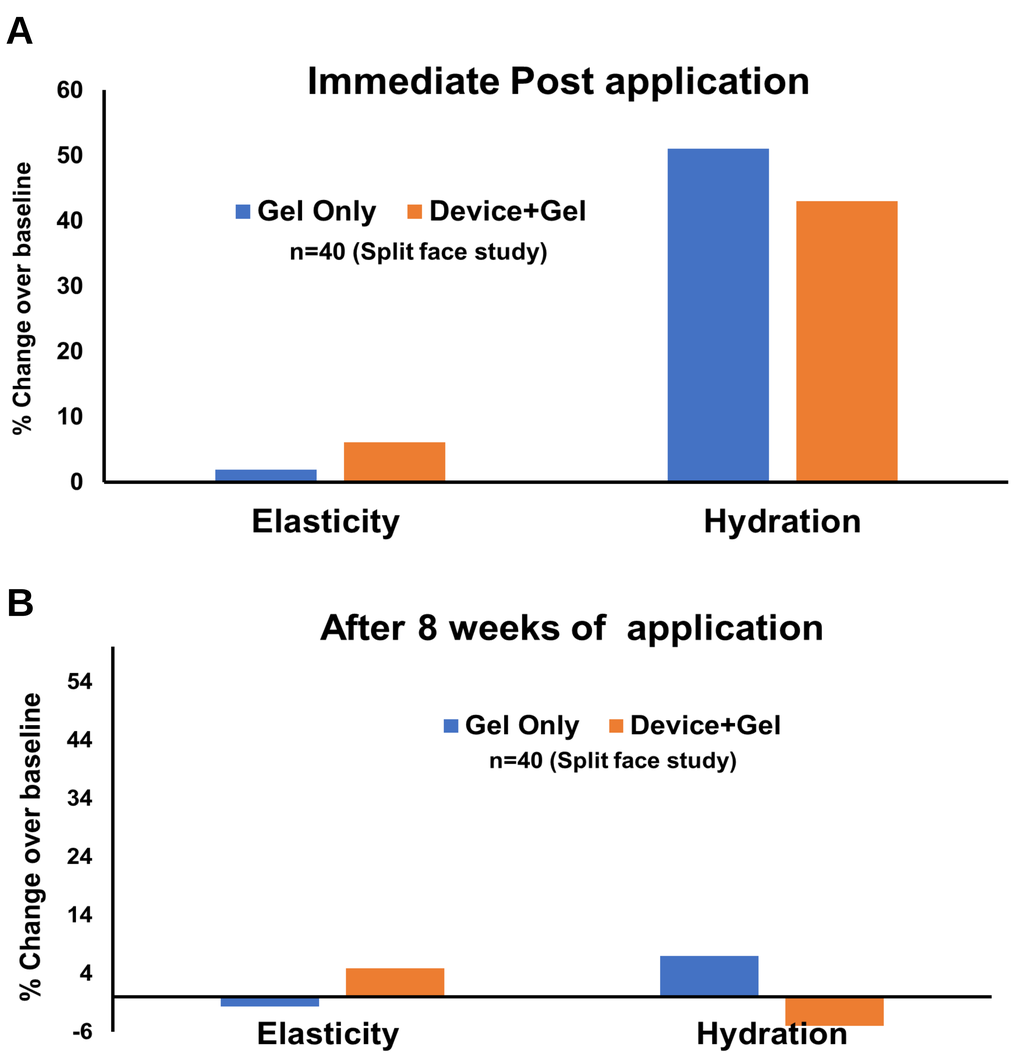

Figure 1. Instrumental assessment of elasticity and hydration

The application of conductive gel in combination with the microcurrent device treatment moderately improved skin elasticity both immediately post-application (A) and after 8 weeks of application (B) as measured by Cutometer. Evaluation of skin hydration with Corneometer immediately post application (A) and at 8 weeks post–treatment showed minimal reduction in skin hydration with device and gel combination when compared to gel only treatment.

Investigator assessment of skin attributes

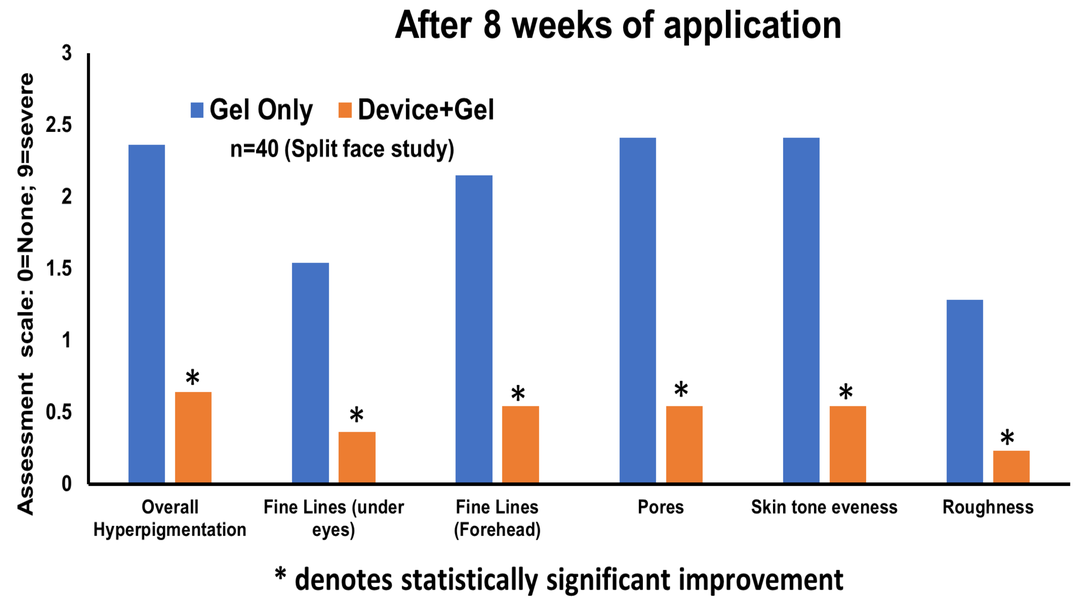

Figure 2. Application of conductive gel in combination with microcurrent treatment improved overall skin attributes after 8 weeks of application, including hyperpigmentation, under eye and forehead fine lines, pores, skin tone evenness, and texture. No tolerability issues were observed throughout the study.

CONCLUSIONS

- Clinical grading showed that application of conductive gel in combination with microcurrent device significantly improved several skin attributes, including overall hyperpigmentation, texture, fine lines, skin tone evenness, and pores at 8 weeks of follow-up.
- Instrumental measurements show improvement in skin elasticity with minimal reduction in skin hydration with use of device and gel combination.
- Microcurrent application of device with the conductive gel is an effective treatment strategy to improve skin quality.

REFERENCES

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