

A Preliminary Randomized Controlled Trial of Pure L-Ascorbic Acid with Using a Needle-Free and Micro-Needle Mesotherapy in Treatment of Anti-Aging Procedure

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Abstract : The epidermis is a keratinized stratified squamous epithelium covered by the hydro-lipid barrier. Therefore, active substances should be able to penetrate through this hydro-lipid coating. L-ascorbic acid is one of the vitamins which plays an important role in stimulation fibroblast to produce collagen type I and in hyperpigmentation lightening. Vitamin C is a water-soluble antioxidant, which protects skin from oxidation damage and rejuvenates photoaged skin. No-needle mesotherapy is a non-invasive rejuvenation technique depending on electric pulses, electroporation, and ultrasounds. These physical factors result in deeper penetration of cosmetics. It is important to increase the penetration of L-ascorbic acid, thereby increasing the spectrum of its activity. The aim of the work was to assess the effectiveness of pure L-ascorbic acid activity in anti-aging therapy using a needle-free and micro-needling mesotherapy. The study was performed on a group of 35 healthy volunteers in accordance with the Declaration of Helsinki of 1964 and agreement of the Ethics Commissions no RNN/281/16/KE 2017. Women were randomized to mesotherapy or control group. Control group applied topically 2,5 ml serum containing 20% L-ascorbic acid with hydrate from strawberries, every 10 days for a period of 9 weeks. No-needle mesotherapy, on the left half of the face and micro-needling on the right with the same serum, was done in mesotherapy group. The pH of serum was 3.5-4, and the serum was prepared directly prior to the facial treatment. The skin parameters were measured at the beginning and before each treatment. The measurement of the forehead skin was done using Cutometer® (measurement of skin elasticity and firmness), Corneometer® (skin hydration measurement), Mexameter® (skin tone measurement). Also, the photographs were taken by Fotomedicus system. Additionally, the volunteers fulfilled the questionnaire. Serum was tested for microbiological purity and stability after the opening of the cosmetic. During the study, all of the volunteers were taken care of a dermatologist. The regular application of the serum has caused improvement of the skin parameters. Respectively, after 4 and 8 weeks improvement in hydration and elasticity has been seen (Corneometer®, Cutometer® results). Moreover, the number of hyper-pigmented spots has decreased (Mexameter®). After 8 weeks the volunteers has claimed that the tested product has smoothing and moisturizing features. Subjective opinions indicted significant improvement of skin color and elasticity. The product containing the L-ascorbic acid used with intercellular penetration promoters demonstrates higher anti-aging efficiency than control. In vivo studies confirmed the effectiveness of serum and the impact of the active substance on skin firmness and elasticity, the degree of hydration and skin tone. Mesotherapy with pure L-ascorbic acid provides better diffusion of active substances through the skin.

Keywords : anti-aging, l-ascorbic acid, mesotherapy, promoters

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