AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

COMPARISON OF THE EFFECTS OF CAFFEINE TOPICAL 0.25%, 0.5% AND 1% TO BARRIER FUNCTION, ELASTICITY, MELANIN AND ERYTHEMA IN THE SKIN

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Introduction: Caffeine is a methylxanthine class that has many benefits in cosmetics because it has high biological activity and ability to penetrate skin barrier. Some studies show topical caffeine have effects to repair skin barrier function, protect skin against ultraviolet radiation, improve microcirculation, anti-cellulite, stimulates hair growth and also a powerful antioxidant.

Objective: To compare the effects of topical caffeine 0.25%, 0.5% and 1% to barrier function, elasticity, melanin and erythema in the skin.

Materials and methods: This double blind randomized control study was conducted on 30 subjects consisted of male and female healthy volunteers aged 20-35 y.o. The subjects were grouped into three. Each group received a topical caffeine with different concentrations of 0.25%, 0.5% and 1%. Hydroxyethylcellulose (HEC) gel as the placebo has 97.5% water content. The treatment was performed on the flexor forearm (middle third) by applying a topical caffeine on one forearm and a placebo on the other forearm. Application of gels was performed 3 times daily for 7 days. Measurement of transepidermal water loss (TEWL) using Tewameter® TM300, elasticity using Elastometer® EM25, melanin and erythema using Mexameter® MX18 were performed before and after treatment. The measurements results were analyzed using T-test and Wilcoxon Signed Ranks Test.

Results: Decreased TEWL obtained in all groups, but only the caffeine 0.5% group were significant ($p=0.047$). Caffeine 0.25% and 1% groups increased elasticity significantly ($p=0.022$;$p=0.035$ respectively). Decreased levels of melanin significantly appear on the caffeine 0.5% group ($p=0.042$) and caffeine 0.25% group ($p=0.039$). There were no differences in the level of erythema in all groups ($p>0.05$). Both sexes had no differences in all outcome measures.

Conclusions: Topical caffeine applications can improve skin barrier function, increase the

elasticity, reduce levels of melanin as well as has no risk of causing erythema on the skin.