AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

IN VIVO COMPARISON OF MODERATE AND HIGH ENERGY OF A NANO-FRACTIONAL RADIOFREQUENCY TREATMENT ON A PHOTOAGING HAIRLESS MICE MODEL

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Background: Fractional radiofrequency (RF) has been widely used in skin rejuvenation. Comparing different parameters is necessary to explore optimal settings.

Objective: This study was designed to compare the collagen remodeling effect of moderate energy and high energy fractional radiofrequency (RF) on a photoaged hairless mice model.

Materials and Methods: Fiften photoaged hairless mice were randomly divided into 3 groups: control group, moderate energy group and high energy group. Two treatment sessions (T×1 and T×2) were performed monthly with 1 pass at each session. Trans-epidermal water loss (TEWL) was measured at baseline, and immediately, week 1, week 2 and week 4 after T×1. Skin samples were harvested before each treatment, at 1 month and 2 months after T×2 to evaluate neocollagenesis by HE staining, Masson staining and immunohistochemistry of type I and III collagen.

Results: TEWLs were significantly increased immediately after treatment and high energy resulted in significantly higher TEWL than moderate energy (P=0.008). Marked fibroblast proliferation was observed at 1month after the first treatment (T×1) in both fractional RF-treated groups, which was kept in a high level in the following 2 months, followed by significant dermal thickening at 1-month and 2-month follow-up after the second treatment (T×2). Immunochemistry showed significant increase in the contents of both type I collagen and type III collagen in dermis at 1-month and 2-month follow-up. There was no statistically significant difference between the two energy levels in fibroblast proliferation, dermal thickness and collagen density at each time point.

Conclusion: Fractional radiofrequency treatment induced marked neocollagenesis on the hairless mice model. Moderate energy level was comparable to high energy level in collagen remodeling, however, with less immediate damage to the skin barrier function.