A Study on Efficacy of Fractional CO2 Laser with Latanoprost VS Fractional CO2 Laser with Topical Tofacitinib in Stable Vitiligo-A RCT

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Abstract

Introduction: Vitiligo is an acquired depigmenting disorder resulting from autoimmune melanocyte destruction. Fractional CO_2 laser has emerged as a promising adjunctive therapy by enhancing trans-epidermal drug delivery and stimulating perifollicular melanocyte activity. Topical agents such as **Latanoprost**, a prostaglandin F2α analogue, and Tofacitinib, a Janus kinase (JAK) inhibitor, have shown results as repigmentation therapies.

Aim & Objectives: To compare efficacy and safety of fractional CO_2 laser + topical Latanoprost 0.005% versus fractional CO_2 laser + topical Tofacitinib 2% gel in stable vitiligo.

Materials & Methods: In this randomized interventional study, 58 patients with stable vitiligo were randomized into two equal groups (n=29). Treatment comprised fractional CO_2 laser sessions every 2 weeks. Immediately post-laser, topical agent was applied and patients continued once-daily topical application at home until the next visit. A total of four laser sessions (weeks 0, 2, 4, 6) were planned with clinical assessment at each visit; final on-treatment assessment occurred at 10 weeks. Outcome measures were MISP (Mean Improvement in Score by Physician) and Global Photographic Assessment (GPA). Adverse events were recorded at each visit. 26 patients in Group A and 27 in Group B completed the protocol.

Results: Tofacitinib group demonstrated faster and greater extent of repigmentation with higher rates of moderate-to-marked improvement by 8th week. Latanoprost group showed predominantly mild-to-moderate improvement. Common transient adverse effects (erythema, edema, burning, post-inflammatory pigmentation) were laser-related and self-limiting.

Conclusion: Both combinations were safe and effective; Fractional CO_2 laser with topical Tofacitinib produced earlier and superior repigmentation.