Topical Hydroquinone 4% Versus Its Combination with Intradermal Autologous Platelet-Rich Plasma for Lichen Planus Pigmentosus: A Split-Face Randomized Controlled Trial

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Abstract

Lichen planus pigmentosus (LPP) is a rare pigmentary disorder commonly affecting sun-exposed areas of the face and neck. Its pathogenesis remains unclear, and conventional treatments often yield suboptimal results. Platelet-rich plasma (PRP) has shown promise in various pigmentary conditions due to its regenerative and melanocyte-modulating effects. This study evaluated the efficacy of combining intradermal autologous PRP with 4% hydroquinone (HQ) compared with HQ monotherapy in LPP. Fifteen patients received intradermal PRP injections on one randomly selected facial side at baseline, week 2, and week 4, while both sides were treated with HQ cream throughout the study. Assessments included the hemi-modified acquired dermal pigmentation and severity index (DPASI), melanin index via a Mexameter, quartile-based patient satisfaction, and adverse effects at baseline and weeks 2, 4, 8, 12, 16, and 20.

In the PRP + HQ group, melanin levels significantly decreased by week 16 (415.80 ± 106.88; $p = 0.015$) and week 20 (404.91 ± 100.77; $p = 0.001$). The HQ-only side also showed significant reductions at week 12. (412.38 ± 94.86; $p = 0.02$), week 16 (395.78 ± 95.25; $p < 0.001$), and week 20 (386.70 ± 92.45; $p < 0.001$). Patients with mild to moderate disease and those without prior PRP exposure demonstrated better responses. DPASI scores improved more on the PRP-treated side, with steadily increasing patient satisfaction and minimal transient side effects. PRP combined with HQ appears more effective than HQ alone in reducing pigmentation in mild to moderate LPP, supporting PRP's role as a potential adjunctive therapy.

Keywords**:** *Hydroquinone, Autologous platelet-rich plasma, Lichen planus pigmentosus, Split-face*