Comparative Efficacy of Fractional CO_2 Laser and Q-Switched Nd:YAG Laser in Combination Therapy with Tranexamic Acid in Refractory Melasma: Results of a Prospective Clinical Trial

Abstract: Melasma manifests as hyperpigmented macules and patches, usually affecting the face, neck, and rarely upper limbs. This study evaluated comparative efficacy of a fractional CO2 laser with a Q-Switched Nd:YAG laser in combination therapy with tranexamic acid in refractory melasma. A total of 30 patients with refractory melasma were included in this study. The fractional CO2 laser (power: 30 w, pulse energy: 30 mJ, tip type: 300, pulse rate: 100/cm2) was used on one side of the patients' face and three passes of the Q-Switched Nd:YAG (QSNY) laser (Wavelength: 1064 nm, pulse energy: 750 mJ, fluence: 1.50 J/cm2, spot size: 4 mm _ 4 mm, hand piece: fractional) were used on the opposite side of the same patient's face for six sessions. During the course of laser therapy, all patients received oral tranexamic acid 250 mg twice daily. Melasma area and severity index (MASI) score and physician's satisfaction and patient's satisfaction were analyzed. Thirty patients (mean age 39.97) were included. Patient global assessment (PtGA) in the fractional CO2 laser group was significantly better than the Q-Switched Nd:YAG laser group at 4th, 8th and 12th weeks (p-value < 0.001). According to PtGA, the improvement was significant in both groups over time. Physician global assessment (PGA) at the 8th and 12th weeks, and physician satisfaction (PS) at the 8th week, in the fractional CO2 laser group was significantly better than the Q-Switched Nd:YAG laser group (p-value < 0.05). The PGA in both groups significantly reduced over time. The MASI score significantly decreased in both groups over time. The MASI score in the fractional CO2 laser group decreased more than the Q-Switched Nd:YAG laser group over time (p < 0.001). The most common side effects reported were erythema and discomfort, which subsided in less than 24 h. A fractional CO2 laser with oral tranexamic acid is an effective and well tolerated therapeutic method for the treatment of patients with refractory melasma.

Keywords: comparative efficacy; melasma; fractional CO2 laser; tranexamic acid