

Effect of Photobiomodulation on Transforming Growth Factor- β_1 , Platelet-Derived Growth Factor-BB, and Interleukin-8 Release in Palatal Wounds After Free Gingival Graft Harvesting: A Randomized Clinical Study

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Abstract

Objective: This study evaluated the impact of photobiomodulation (PBM) on the healing of the donor palatal area following free gingival graft (FGG) harvesting by examining changes in transforming growth factor (TGF)- β_1 , platelet-derived growth factor (PDGF)-BB, and interleukin (IL)-8 levels in palatal wound fluid (PWF).

Material

and methods: Thirty patients were selected and randomly assigned to receive PBM (laser group) or PBM sham (sham group) in the palatine area after FGG harvesting. Aneodymium-doped yttrium aluminum garnet (Nd:YAG) laser (1064 nm) was applied to the test sites immediately after surgery and every 24 h thereafter for 4 days. PWF was collected on Days 7 and 12, and PWF TGF- β_1 , PDGF-BB, and IL-8 levels were analyzed by enzyme-linked immunosorbent assays (ELISA).

Results: PWF TGF- β_1 , PDGF-BB, and IL-8 levels were significantly lower on Day 12 than on Day 7 for both groups. PWF TGF- β_1 , PDGF-BB, and IL-8 levels of the laser group were significantly higher than those of sham group on Day 7 ($p < 0.05$). PWF TGF- β_1 levels were also significantly higher in laser group than in the sham group on Day 12; however, differences in PDGF-BB and IL-8 levels between groups on Day 12 were statistically nonsignificant.

Conclusions: Observed increases in PWF TGF- β_1 , PDGF-BB, and IL-8 levels suggest that PBM may accelerate wound healing by stimulating production of selected mediators.