

# Clinical and biochemical effects of diode laser as an adjunct to nonsurgical treatment of chronic periodontitis: a randomized, controlled clinical trial

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**Abstract** The aim of this randomized, parallel, controlled clinical trial was to examine the clinical and biochemical efficacy of diode laser as an adjunct to scaling and root planing (SRP). Thirty chronic periodontitis patients were randomly assigned into two groups to receive SRP alone (control) or SRP followed by diode laser (test). Plaque index, gingival index, bleeding on probing, probing depth, and clinical attachment level were measured at baseline and at 1, 3, and 6 months after treatment. The gingival crevicular fluid levels of interleukin-1 $\beta$  (IL-1 $\beta$ ), interleukin-6 (IL-6), interleukin-8 (IL-8), matrix metalloproteinase-1 (MMP-1), matrix metalloproteinase-8 (MMP-8) and tissue inhibitor matrix metalloproteinase-1 (TIMP-1) were analyzed by enzyme-linked immunosorbent assay. Test group showed significantly a better outcome compared to the control group in full-mouth clinical parameters. MMP-1, MMP-8, and TIMP-1 showed significant differences between groups after treatment compared to baseline ( $p < 0.05$ ). The total amount of IL-1 $\beta$ , IL-6, MMP-1, MMP-8, and TIMP-1 decreased ( $p < 0.05$ ) and IL-8 increased after treatment in both test and control groups ( $p < 0.05$ ). Diode laser provided

significant improvements in clinical parameters and MMP-8 was significantly impacted by the adjunctive laser treatment at first month providing an insight to how lasers can enhance the outcomes of the nonsurgical periodontal therapy.

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