

## Periodontopathic microorganisms in peripheric blood after scaling and root planing.

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### Author information

#### Abstract

**AIM:** The objective of this study was to evaluate the frequency of periodontopathic and other subgingival anaerobic and facultative bacteria in the bloodstream following scaling and root planing (SRP).

**MATERIAL AND METHODS:** Forty-two patients with severe generalized chronic periodontitis (GChP) and generalized aggressive periodontitis (GAgP) were included in the study. Four samples of peripheric blood were drawn from the cubital vein at different times: Pre-treatment: immediately before the SRP procedure (T1), immediately after treatment (T2), 15 min. post-treatment (T3) and 30 min. post-treatment (T4). In order to identify the presence of microorganisms in blood, subcultures were conducted under anaerobic conditions.

**RESULTS:** 80.9% of the patients presented positive cultures after SRP and it occurred more frequently immediately after treatment; however, 19% of the patients still had microorganisms in the bloodstream 30 min. after the procedure. The periodontopathic microorganisms more frequently identified were Porphyromonas gingivalis and Micromonas micros. Campylobacter spp., Eikenella corrodens, Tannerella forsythensis, Fusobacterium spp. and Prevotella intermedia were isolated less often. Actinomyces spp. were also found frequently during bacteraemia after SRP.

**CONCLUSIONS:** SRP induced bacteraemia associated with anaerobic bacteria, especially in patients with periodontal disease.

## Effect of the diode laser on bacteremia associated with dental ultrasonic scaling: a clinical and microbiological study.

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#### Abstract

**OBJECTIVE:** The purpose of this study is to evaluate the potential use of diode lasers (DLs) to reduce bacteremia associated with ultrasonic scaling (US). Furthermore, the clinical efficacy of DLs as an adjunct to US in the treatment of gingivitis was investigated.

**BACKGROUND DATA:** Recently, lasers have found new applications in dental practice. The benefits of the use of DLs as an adjunct to US have not yet been determined.

**METHODS:** Twenty-two gingivitis patients were treated using a split-mouth study design in which each side was randomly treated by US alone or DL followed by US (DL + US). Blood samples were drawn just before and during US in each treatment step to detect induced bacteremia. Clinical parameters including plaque index, sulcus bleeding index, probing depth, and relative attachment level were recorded at baseline and 4 weeks postoperatively.

**RESULTS:** Bacteremia was detected in 15 patients (68%) after US alone, and in 8 patients following DL + US (36%). The reduction of the incidence of odontogenic bacteremia during US after the application of DL was statistically significant ( $p < 0.05$ ). Clinical signs improved eventually, with no significant differences between the two treatment regimens ( $p > 0.05$ ).

**CONCLUSIONS:** Application of DL energy can reduce bacteria in gingival crevices which may reduce bacteremia following US. The use of DL did not show additional clinical influence on gingival healing after treatment of gingivitis with US.

#### Abstract

**BACKGROUND:** The aim of this study is to evaluate the effect of low-level laser therapy (LLLT) as an adjunct to non-surgical periodontal therapy of smoking and non-smoking patients with moderate to advanced chronic periodontitis.

**METHODS:** All 36 systemically healthy patients who were included in the study initially received non-surgical periodontal therapy. The LLLT group ( $n = 18$ ) received GaAlAs diode laser therapy as an adjunct to non-surgical periodontal therapy. A diode laser with a wavelength of 808 nm was used for the LLLT. Energy density of 4 J/cm<sup>2</sup> was applied to the gingival surface after periodontal treatment on the first, second, and seventh days. Each of the LLLT and control groups was divided into two groups as smoking and non-smoking patients to investigate the effect of smoking on treatment. Gingival crevicular fluid samples were collected from all patients and clinical parameters were recorded on baseline, the first, third, and sixth months after treatment. Matrix metalloproteinase-1, tissue inhibitor matrix metalloproteinase-1, transforming growth factor- $\beta$ 1, and basic-fibroblast growth factor levels in the collected gingival crevicular fluid were measured.

**RESULTS:** The primary outcome variable in this study was change in gingival bleeding and inflammation. At all time points, the LLLT group showed significantly more improvement in sulcus bleeding index (SBI), clinical attachment level, and probing depth (PD) levels compared to the control group ( $P < 0.001$ ). There were clinically significant improvements in the laser-applied smokers' PD and SBI levels compared to smokers to whom a laser was not applied, between the baseline and all time points ( $P < 0.001$ ) (SBI score: control group 1.12, LLLT group 1.49; PD: control group 1.21 mm, LLLT group 1.46 mm, between baseline and 6 months). Transforming growth factor- $\beta$ 1 levels and the ratio of matrix metalloproteinase-1 to tissue inhibitor matrix metalloproteinase-1 decreased significantly in both groups at 1, 3, and 6 months after periodontal therapy ( $P < 0.001$ ). Basic-fibroblast growth factor levels significantly decreased in both groups in the first month after the treatment, then increased in the third and sixth months ( $P < 0.005$ ). No marker level change showed significant differences between the groups ( $P < 0.05$ ).

**CONCLUSION:** LLLT as an adjunctive therapy to non-surgical periodontal treatment improves periodontal healing.

## Clinical and biochemical effects of 810 nm diode laser as an adjunct to periodontal therapy: a randomized split-mouth clinical trial.

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#### Abstract

**OBJECTIVE:** The aim of this clinical trial was to determine the clinical and biochemical efficacy of an 810 nm diode laser as an adjunct to scaling and root planing (SRP).

**BACKGROUND DATA:** Lasers can achieve excellent tissue ablation with strong bactericidal and detoxification effects. The use of lasers is one of the most promising new technical modalities for nonsurgical periodontal treatment. However, the most effective wavelength and parameters for their use are still under investigation.

**METHODS:** This study was designed as a single-blinded, randomized-controlled, split-mouth clinical trial. Twenty-one patients (12 females and 9 males between 26 and 55 years of age), diagnosed with generalized chronic periodontitis, were included in the study. After initial periodontal therapy, which consisted of oral hygiene instructions and scaling, patients underwent two different treatment modalities. Test and control sites were chosen with coin toss randomization. At the test site, patients received SRP and laser treatment; at the contralateral control site, they received SRP treatment alone.

**RESULTS:** Both treatment modalities resulted in significant improvements in all clinical and biochemical parameters. Sites irradiated with an 810 nm diode laser using the "hot tip" (~ 760 °C) technique showed enhanced healing in all the registered periodontal variables and interleukin (IL)-1 $\beta$  levels, compared with SRP alone.

**CONCLUSIONS:** Within the limitations of this study, the use of diode lasers as an adjunct to SRP produced significant improvements in clinical parameters as well as gingival crevicular fluid (GCF) IL-1 $\beta$  levels in the 6 month study period.

## Bacterial reduction in periodontal pockets through irradiation with a diode laser: a pilot study.

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#### Abstract

This study examines the application of a diode laser with a wavelength of 805 nm for periodontal treatment. While the use of the diode laser in this field has not been investigated so far, several authors have reported on the use of neodymium:yttrium-aluminum-garnet (Nd:YAG) laser for such applications. The aim of this study was to examine the immediate effect of the diode laser in reducing the bacterial concentration in periodontal pockets. Important periodontal indices (PBI, CPITN) were assessed in 50 patients to obtain initial values for a planned long-term study and to select appropriate periodontal pockets for this study. The periodontal pockets were required to have a minimum depth of 4 mm. Only proximal pockets were included in this study. The patients were subdivided into two groups. After microbiological samples had been collected with sterile paper tips, the group selected for laser treatment was subjected to scaling. One week after scaling, the patients underwent laser treatment. One week later, a second series of microbiological samples were obtained and the patients were subjected again to scaling; this time, however, they did not undergo laser treatment after 1 week. Two weeks after scaling, another series of microbiological samples was collected. The microbiological samples were evaluated to verify bacterial elimination from the periodontal pockets. A comparison between the initial and the final bacterial counts revealed that irradiation with the diode laser facilitates considerable bacterial elimination, especially of Actinobacillus actinomycetemcomitans, from periodontal pockets.

## 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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### Author information

#### 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.