

PHOTODYNAMIC THERAPY (PDT) IN PERIODONTOLOGY. LITERATURE SEARCH AND CLINICAL/MICROBIOLOGICAL DATA

B. Brink¹, G.E. Romanos²

¹Private dental clinic, Warburg, Germany

²University of Rochester, Eastman Dent Cent, Rochester, NY
Sternstrasse 50, 34414 Warburg, Germany

Introduction: Different methods of periodontitis therapy and the support of laser irradiation on periodontal tissues have been reported. However, the use of photodynamic therapy (PDT) as an adjunct to SRP has to be evaluated.

Purpose: The aim of this clinical and microbiological study from a dental clinic was to investigate the influence of two well-known laser wavelengths and PDT on the periodontal bacterial spectrum as well as the clinical outcome in patients with chronic periodontitis (PA). A literature search on the use of PDT in the treatment of PA has been also performed.

Materials and Methods: Literature search analysis has been performed using the PUBMED and MEDLINE. Four methods were used (randomly) to treat the periodontitis: SRP as control group, SRP + diode laser (980 nm), SRP + Nd:YAG laser (1,064 nm) and photodynamic therapy (670 nm). Ten patients (253 pockets deeper than 5 mm) were treated over a period of 3 months; a total of 325 microbiological samples were taken and evaluated (after 3, 7 days as well as after 1 and 3 months). The bleeding index (BOP), probing depth and tooth mobility were measured before the start of treatment, after one month and after three month. Treatment was conducted with a power setting of 2 W (cw); 75 mW in the case of PDT for 20 seconds.

Results: Limited data exist in the performed literature search. The average bacteria reduction of all bacteria investigated after treatment by SRP + PDT was the best: 87.57% ($p < 0.001$) on the 3rd day and 83.74% ($p < 0.05$) on the 7th day, at 80.11% ($p > 0.05$) after 1 month and 91.37% ($p > 0.05$) after 3 months. Regarding BOP, the results increased after 1 month in every case.

Conclusions: The use of PDT adjuvant to SRP seems to be an interesting alternative in the treatment of PA, because of the bacteria reduction in the pockets. More studies using this method are necessary to establish the PDT in the daily practice.

PHOTODYNAMIC THERAPY IN THE TREATMENT OF INFECTED ROOT CANALS

Bello-Silva, MS*; Ribeiro, MS; Eduardo, CP; Garcez, AS;
Gouw-Soares, S; Lage-Marques, JL

LELO- Special Laboratory of Lasers in Dentistry, School of Dentistry of the University of São Paulo, Av. Prof. Lineu Prestes, 2227, 5508-000 São Paulo - SP Brazil

Root canal disinfection is of extreme importance for the success of endodontic treatment. Limitations of the traditional technique and presence of resistant microorganisms in root canal indicate the Photodynamic Therapy (PDT) as a possible coadjuvant in the treatment of complex cases, as its action on these microorganisms has been widely reported in literature. This study evaluated root canal disinfection after traditional treatment and PDT. Sixteen patients presenting periapical lesion had the canal instrumented and irrigated with NaOCl 2,5% e H₂O₂ 3%. The canals were dried, filled with poli-lisine-clorine-6 and irradiated with low level laser (660 nm, 30 mW, 7.2 J total energy). Microorganisms were

collected before and after canal instrumentation and after PDT. Seven day later, microbial collection was performed following intracanal medicament removal with saline solution and after the new PDT performance immediately before canal filling. Traditional treatment reduced microorganisms in 90.57%, and PDT in 97.81% ($p < 0.0001$). After one week, recolonization reached 35.6% from the initial quantity of microorganisms. After new PDT, microorganisms reduction was 97.47% ($p < 0.0001$). The association of PDT promoted significantly higher disinfection of root canals than traditional treatment alone, thus becoming a possible coadjuvant to the treatment of periapical lesions of difficult solution.

PHOTODYNAMIC THERAPY IN TREATMENT OF HERPES LABIALIS

J Marotti*, ACC Aranha, CP Eduardo

LELO - FOU SP (School of Dentistry of the University of São Paulo)

Av. Prof. Lineu Prestes, 2227 05508-000 São Paulo-SP Brazil

Several treatments have been proposed for the treatment of herpes labialis (HSV-1), however few of them are efficient. High intensity lasers (HLL) have been used for the treatment of HSV-1 on its vesicle stage, while low intensity lasers (LIL) for improvement of the healing process and minimizing the frequency of vesicles appearance. However, many patients report discomfort during HLL irradiation due to the increase of temperature. Studies report the potential of photodynamic therapy (PDT) in viral inactivation, which can also be used on the vesicle stage of HSV-1. The aim of this presentation is to show ten clinical cases in which PDT or HLL were used, associated with LIL, for the treatment of HSV-1 on the vesicle stage. For PDT it was used the blue methylene dye 0,01% and a LIL (660 nm, 100 J/cm², 100 mW, 2.7 J, 27 s per point, spot size of 0,027 cm²). The HLL used was a diode (1W), an Er:YAG laser (80 mJ, 2Hz) and an Er,Cr:YSGG laser (0,75W, 7% air and 10% water). Laser phototherapy was performed after 24 h, 48 h and 1 week (660 nm, 3.8 J/cm², 15 mW, 0.15 J, 10s per point, spot size of 0,04 cm²). The results showed that the laser irradiation accelerated the healing process, decreased the frequency of the lesions, providing satisfaction and comfort to the patients. However, some of them reported pain during irradiation with HLL, while in PDT treatment no pain was recorded. It can be concluded that PDT and HLL, associated with laser phototherapy is an efficient treatment for HSV-1.

PREDICTABILITY OF USING ER:YAG LASER TO PREPARE BONE FOR DENTAL IMPLANT PLACEMENT- A PRELIMINARY STUDY

Ryan S K Seto

AALZ RWTH Aachen University, Germany

1F Toi Shan Centre, 128 Johnston Road, Wanchai, HK

The objective of this study was to investigate if it is possible to use an end-cutting Er:YAG laser to prepare the bone with the resulted bony surface suitable for osseointegration and a favorable primary stability be achieved by the designed method. Materials and Method: Part A: Cavities on bovine rib bone were prepared by 3 different methods: 1. Conventional drills with recommended drill sequence. 2. Er:YAG laser with surgical guide and the specially designed method. 3. Er:YAG laser with surgical guide, osteotome instrument and the designed method. The 3 bony cavities prepared