Six-month outcomes of a randomized controlled clinical trial evaluating the clinical outcomes following the use of transgingival photodynamic therapy (tPDT) in conjunction with scaling and root planing during supportive periodontal therapy

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Background

Antibacterial photodynamic therapy (PDT) has been effective in periodontal therapy. Previous laser light applications included the placement of a light fibre into the periodontal pocket to activate the photosensitizer.

Using a novel approach, the transgingival laser application of PDT (tPDT) was previously studied in patients during initial periodontal therapy (Mettraux & Hüsler 2011).

Data on patients enrolled in supportive periodontal therapy (SPT) receiving treatment of residual pockets with tPDT are currently lacking.

Objectives

To evaluate the clinical effects of transgingival photodynamic therapy (tPDT) used in conjunction with nonsurgical periodontal therapy during supportive periodontal therapy (SPT).

Materials and Methods

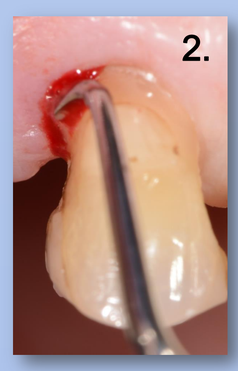
Forty patients enrolled in SPT at the Department of Periodontology, University of Bern, were randomly assigned to two groups of equal size.

At baseline, study sites had to show signs of inflammation (Bleeding on Probing (BOP) positive) and a probing pocket depth (PPD) of 5 mm or more.

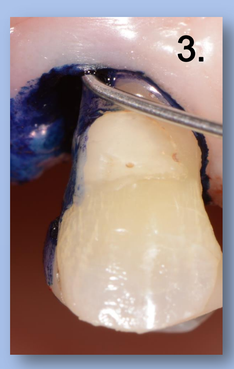
Full mouth and site-specific Plaque Index (PlI), BOP, Probing Pocket Depth (PPD), and Clinical Attachment Level (CAL) were recorded at baseline (BL), at three months (3M), and 6 months (6M), respectively.

The primary outcome variable was the change in the number of sites with BOP.

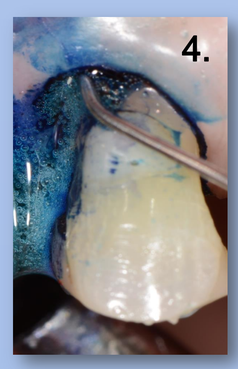
PPD ≥5mm
BOP positive site



Scaling and root planing during SPT



Test group:
Application of Methylene Blue (1%-Phenothia-zine-Chloride) for 1 minute



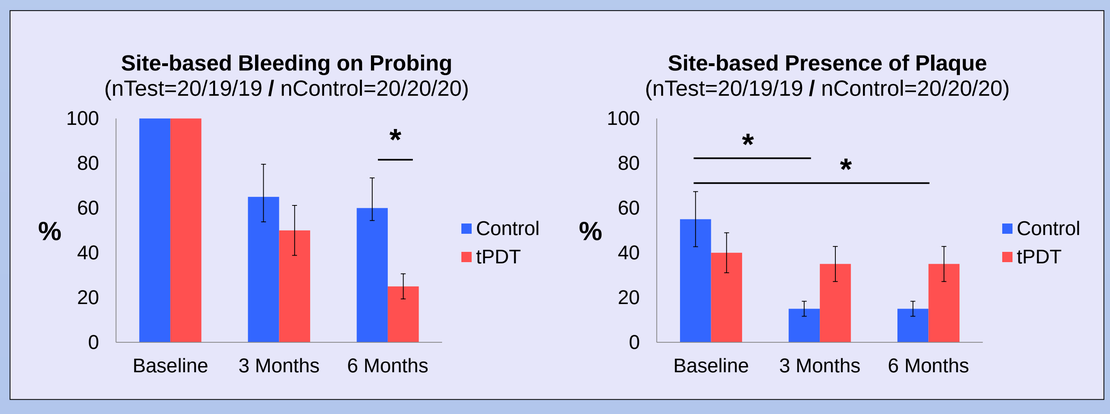
Test group:
Rinsing with 3% hydrogen peroxide

Test group:
Hand-held diode laser (MED 701, ORCOS MEDICAL, Küsnacht, Switzerland) at 670nm wavelength and 100% power (330 mWatt) for 2 minutes slightly moved in overlapping circles on the both buccal and oral aspects of the study site

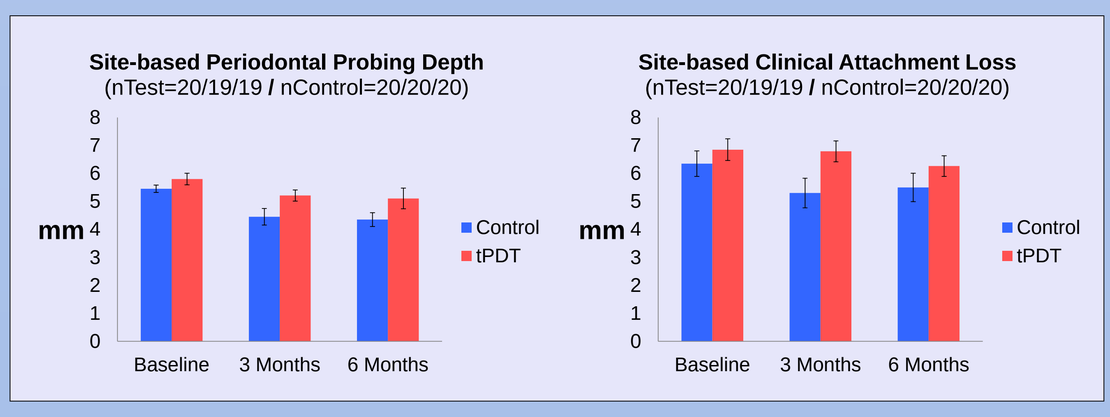
Results

Baseline	All patients n = 40 mean (±SD)	*min.-max.*	Test (tPDT) n = 20 mean (±SD)	*min.-max.*	Control n = 20 mean (±SD)	*min.-max.*	*p-value*
Age	59.0 (±10.5)	*26-81*	60.8 (±10.7)	*34-81*	57.3 (±10.3)	*26-72*	*n.s.*
Gender (female)	17 (42.5%)	*N.A.*	9 (45.0%)	*N.A.*	8 (20.0%)	*N.A.*	*n.s.*
Smokers	8 (20.0%)	*N.A.*	5 (12.5%)	*N.A.*	3 (15.0%)	*N.A.*	*n.s.*

39 Patients completed the study. Full mouth PI and BOP improved over six month without significant difference between the groups. **At 6M, however, the number of site-based BOP was significantly lower in test sites (25.0%) compared with control sites (60.0%), (p=0.025, Fisher's exact test).**



PPD improved over time in both groups with comparable mean values at 3M (PPD test: 5.21 mm; control: 4.45 mm) and 6M (PPD test: 5.11 mm; control: 4.35 mm). Additionally, CAL slightly improved over time in both groups with comparable mean values at 3M (CAL test: 6.79mm; control: 5.30mm) and 6M (CAL test: 6.62 mm; control: 5.50 mm).



Conclusion

During supportive periodontal therapy, the use of tPDT adjunctive to SRP appears to represent a promising modality for infection control of residual pockets.

Funding

This study was supported by ORCOS MEDICAL, Switzerland.

Reference

Implementation of transgingival antibacterial photodynamic therapy (PDT) supplementary to scaling and root planing. A controlled clinical proof-of-principle study. Mettraux G, Hüsler J. Schweiz Monatsschr Zahnmed. 2011;121(1):53-67.