

Antimicrobial photodynamic therapy as adjunct to the non-surgical treatment of Aggressive Periodontitis without the use of systemic antibiotics

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Background

The management of aggressive periodontitis (AgP) represents a challenge for clinicians because there are no standardized protocols for an efficient control of the disease. This randomized controlled clinical trial evaluated the effects of repeated applications of antimicrobial photodynamic therapy (aPDT) adjunctive to scaling and root planing (SRP) in patients with AgP without the use of systemic antibiotics.

Methods and Materials

Using a split-mouth design, 20 patients with generalized AgP were treated with aPDT + SRP (test group) or SRP only (control group). aPDT was applied at four periods. All patients were monitored for 90 days. Clinical and microbiologic parameters were statistically analyzed. No systemic antibiotics was used.

Results

Table 1. Means and standard deviations of PPD and CAL Test and Control groups at baseline, 30 and 90 days post-SRP and Intergroup Comparisons.

VARIABLE	TIME POINT	EXPERIMENTAL GROUPS		INTERGROUPS COMPARASIONS		
		Control Mean ± SD	Test Mean ± SD	MD	(Paired t Test) CI 95%	<i>p</i> value
PPD (mm)						
Moderate pockets	Baseline	5,17 ± 0,42	5,20 ± 0,42 ^a	0.10	-0.3248 to 0.1248	NS
	30 days	3,19 ± 0,98*	3,21 ± 1,26*	-0.2375	-0.3078 to 0.7828	NS
	90 days	3,13 ± 1,14*	2,84 ± 0,89*	-0.1660	-0.2076 to 0.5396	NS
Deep pockets	Baseline	7,68 ± 0,92	7,73 ± 0,87	0.04327	-0.7887 to 0.7022	NS
	30 days	5,94 ± 1,22*	5,14 ± 1,01*	-0.7965	-0.1344 to 1.727	NS
	90 days	5,12 ± 0,80*	3,77 ± 0,97*	-1.356	0.6130 to 2.099	0,0019
CAL (mm)						
Moderate pockets	Baseline	5,66 ± 1,16	5,36 ± 0,56	-0.02500	-0.4237 to 0.4737	NS
	30 days	4,21 ± 1,62*	4,61 ± 1,86*	-0.4625	-0.2401 to 1.165	0.0376
	90 days	3,97 ± 1,72*	3,65 ± 1,40*	0.0165	-0.6554 to 0.6224	NS
Deep pockets	Baseline	7,75 ± 1,21	7,90 ± 0,93	0.1538	-1.046 to 0.7384	NS
	30 days	6,26 ± 1,16*	5,20 ± 1,09*	-0.3534	-0.5806 to 1.287	NS
	90 days	6,20 ± 0,93*	5,19 ± 0,62*	-1.051	0.3990 to 1.703	0.0046

PPD=probing pocket depth; CAL=clinical attachment level; SD=standard deviation; CI=confidence interval; NS=no significant difference; SRP=scaling and root planing, MD=Mean difference. *Significant difference when compared to *baseline* (repeated measures ANOVA, Bonferroni post hoc test, $p < 0.05$).

Table 2. Absolute and relative frequencies for BOP and residual periodontal pocket in Test and Control groups and Intergroup Comparisons.

		EXPERIMENTAL GROUPS		Chi-Square Test	
		Control Mean ± SD	Test Mean ± SD	Relative Risk	<i>p</i> value
BOP					
	Baseline	154 (64.16)	144 (60.00)	0.9161	NS
	30 days	69 (28,87)*	26 (13,50)*	0.4924	< 0.001
	90 days	36 (15,00)*	22 (15,00)*	1.000	NS
Residual Pockets					
	90 dias	35 (27.34)	14 (10.37)	0.5053	0.0004

BOP=bleeding on probing; NS=no significant difference. *Significant difference when compared to *baseline* (Friedman Test, $p < 0.05$).

Conclusion

The application of four sessions of aPDT, adjunctive to SRP, promotes additional clinical and microbiologic benefits in the treatment of deep periodontal pockets in single-rooted teeth in patients with AgP, without the use of systemic antibiotics.

Figure 1. Mean counts ($\times 10^5$) of 40 bacterial species in Control and Test groups at baseline, 30 and 90 days treatment, and the results of intragroup comparisons. Statistically significant differences when compared to baseline: Control Group at 30 (*) and 90 (Ψ) days; Test Group at 30 (†) and 90 (Φ) days. Wilcoxon Test ($p < 0.0012$ for oral species and $p < 0.002$ for non-oral species). **A:** Moderate Pockets; **B:** Deep Pockets.

