Custom Tray Application of Peroxide Gel as an Adjunct to Scaling and Root Planing in the Treatment of Periodontitis: Results of a Randomized Controlled Trial after Six Months

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Abstract

• Objective: Scaling and root planing (SRP) is the primary non-surgical treatment for periodontitis, but its effectiveness is limited. Consequently, various adjunctive therapies have been investigated to improve clinical outcome. This study evaluated the clinical effects of one SRP procedure alone or combined with local administration of hydrogen peroxide gel using customized trays for the treatment of subjects with chronic periodontitis over a period of six months.

• Methods: An examiner-blind clinical trial was conducted among 30 subjects with moderate to advanced periodontitis who were randomized to SRP alone or SRP combined with prescription custom-tray application (Perio Tray®) of 1.7% hydrogen peroxide gel (Perio Gel®) for a period of three months, then extended to six months. Following impressions for the test group, all subjects brushed twice daily with a regular dentifrice and toothbrush for a four-week acclimation phase to standardize oral conditions (while trays were fabricated) prior to initiating the treatment phase. SRP was performed three weeks after baseline, and clinical assessments, i.e., pocket probing depth (PPD) and bleeding index (BI), were conducted at baseline and after two, five, 13, and 26 weeks of peroxide gel applications. Clinical variables were compared by ANCOVA and paired t-tests after each treatment interval.

• Results: A total of 13 test and 15 control subjects completed the original three-month trial, of whom 10 test and 13 control subjects finished the three-month extension. After two weeks of peroxide gel use prior to SRP, mean PPD for the test group significantly decreased from baseline by 0.21 mm and mean BI significantly dropped by 0.14; clinical parameters for the control group were unchanged. Two weeks following SRP, mean PPD significantly decreased from baseline by 0.65 mm for the test group and 0.17 mm for the control; mean BI significantly dropped by 0.17 for the test group and 0.05 for the control. Ten weeks following SRP, mean PPD decreases were 0.77 mm for the test group and 0.13 mm for the control, and mean BI reductions were 0.14 for the test group and 0.00 for the control. For subjects who completed the three-month extension (i.e., 23 weeks post-SRP), mean PPD decreases were 0.72 mm for the test group and 0.13 mm for the control, and mean BI reductions were 0.05 for the test group and 0.01 for the control. Analysis of deeper pockets (i.e., > 5 mm at baseline) showed the same relationship for PPD, but with larger differences between groups. For example, after two weeks of peroxide gel use prior to SRP, mean PPD decreased by 0.48 mm for the test group compared to 0.04 mm for the control. Two weeks after SRP, mean PPD decreased from baseline by 1.40 mm for the test group and 0.60 mm for the control, and 10 weeks after SRP by 1.57 mm for the test group and 0.58 mm for the control. After the extension (i.e., 23 weeks post-SRP), mean PPD changed from baseline by 1.50 mm for the test group and 0.55 mm for the control. With the exception of BI at 23 weeks post-SRP, all reductions cited above for the test group were statistically significantly different from the control group for both PPD and BI for all comparisons.

• Conclusion: When compared with SRP alone, clinical improvements in PPD (e.g., ~1.0 mm for pockets > 5 mm at baseline) were maintained for up to six months after SRP with adjunctive use of 1.7% hydrogen peroxide gel, locally administered using prescription customized trays in the treatment of subjects with moderate to advanced periodontitis.

(J Clin Dent 2013;24:100–107)