Custom Tray Application of Peroxide Gel as an Adjunct to Scaling and Root Planing in the Treatment of Periodontitis: A Randomized, Controlled Three-Month Clinical Trial

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Abstract

• **Objective:** Periodontitis is an inflammatory condition of the supporting dental tissues that is normally treated by mechanical removal of the subgingival biofilm. This mechanical treatment, generally known as scaling and root planing (SRP), is not entirely effective, and various adjunctive therapies have been investigated to improve the clinical outcome. This study evaluated the clinical effects of SRP alone or combined with local administration of hydrogen peroxide gel using customized trays in the treatment of subjects with chronic periodontitis.

• **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 a prescription custom-tray application (Perio Tray®) of 1.7% hydrogen peroxide gel (Perio Gel®) for a period of three 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. Clinical assessments, *i.e.*, pocket probing depth (PPD) and bleeding index (BI), were conducted at baseline and after two, five, and 13 weeks of peroxide applications; SRP was performed three weeks after baseline. Clinical variables were compared by ANOVA and paired t-tests after each treatment interval.

• **Results:** A total of 13 test and 15 control subjects completed the study. After two weeks of peroxide gel use prior to SRP, mean whole-mouth PPD was unchanged for the control group, but significantly decreased 0.21 mm in the test group. Two weeks following SRP, mean PPD decreased from baseline by 0.17 mm for the control group and 0.65 mm for the test group. Ten weeks following SRP, mean PPD decreases were 0.13 mm for the control group and 0.77 mm for the test group. After two weeks of peroxide use prior to SRP, mean whole-mouth BI decreased 0.03 (from 15% to 12%) for the control and 0.14 (from 23% to 9%) for the test group. Two weeks after SRP, the mean whole-mouth BI score decreased 0.05 from baseline (15% to 10%) for the control and 0.17 (23% to 6%) for the test group. Ten weeks after SRP, there was no change from baseline for the control group, but BI was 0.14 lower (23% to 9%) for the test group. Further analysis showed the same statistical relationship between groups for PPD assessments of deeper pockets. For pockets ≥ 6 mm at baseline, mean PPD decreased by 0.04 mm for the control compared to 0.48 mm for the test group after two weeks of peroxide gel use and prior to SRP. Two weeks after SRP, mean PPD decreased from baseline by 0.60 mm for the control and 1.40 mm for the test group, and 10 weeks after SRP by 0.58 mm for the control and 1.57 mm for the test group. All reductions cited above for the test group were statistically significantly different from the control group for both PPD and BI.

• **Conclusion:** The adjunctive use over three months of 1.7% hydrogen peroxide gel, locally administered using prescription customized trays in the treatment of subjects with moderate to advanced periodontitis, demonstrated statistically significant clinical improvements in pocket depths and bleeding when compared with SRP alone.

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