ABSTRACT

Objective: To (1) quantify the diagnostic techniques used by Dental Practice-Based Research Network (DPBRN) dentists before they decide to treat primary caries lesions surgically and (2) examine whether certain dentist, practice, and patient characteristics are associated with their use.

Methods: A total of 228 DPBRN dentists recorded information on 5,676 consecutive restorations inserted due to primary caries lesions on 3,751 patients. Practitioner-investigators placed a mean of 24.9 (SD = 12.4) restorations. Lesions were categorized as posterior proximal, anterior proximal, posterior occlusal, posterior smooth, or anterior smooth. Techniques used to diagnose the lesion were categorized as clinical assessment, radiographs, and/or optical. Statistical analysis utilized generalized mixed-model ANOVA to account for the hierarchical structure of the data.

Results: By lesion category, the diagnostic technique combinations used most frequently were clinical assessment plus radiographs for posterior proximal (47%), clinical assessment for anterior proximal (51%), clinical assessment for posterior occlusal (46%), clinical assessment for posterior smooth (77%), and clinical assessment for anterior smooth (80%). Diagnostic technique was significantly associated with lesion category after adjusting for clustering in dentists (p < 0.0001).

Conclusion: These results — obtained during actual clinical procedures rather than from questionnaire-based hypothetical scenarios — quantified the diagnostic techniques most commonly used during the actual delivery of routine restorative care. Diagnostic technique varied by lesion category and with certain practice and patient characteristics.

KEY WORDS

Dental caries, dentists’ practice patterns, diagnostic techniques and procedures
Abstract

The Soladey™ toothbrush (Shiken Corp., Osaka, Japan) is based on the principle that electrical induction will cause a wetted titanium dioxide semiconductor to emit electrons. The manufacturer claims that in addition to the established mechanical benefits of brushing, the flow of electrons from the brush head may disrupt ionic bonding of plaque, neutralize bacterial organic acids, and thus confer an advantage over a conventional toothbrush.

**AIM:** Determine whether a TiO2 semiconductor-containing toothbrush confers an advantage over a conventional toothbrush in adult patients with mild-to-moderate gingivitis/periodontitis.

**MATERIALS and METHODS:** Seventy-one patients with mild-to-moderate gingivitis/periodontitis were enrolled in this randomized, double-blind, placebo-controlled modified crossover trial that compared the Soladey-3 titanium dioxide semiconductor toothbrush (Shiken Corp., Osaka, Japan) to an otherwise identical toothbrush containing an inert resin core in place of the semiconductor. Changes in indices of gingivitis and periodontitis were the primary outcomes.

**RESULTS:** Sixty-six patients completed the study. Relative to baseline, an almost two-fold increased gingival crevice fluid flow followed both active and control treatments was statistically significant. Relative to the inactive control device, the active Soladey-3 toothbrush had no clinically meaningful effects on selected markers of gingivitis/periodontitis.

**CONCLUSIONS:** The active Soladey-3 toothbrush did not substantially impact selected markers of gingivitis/periodontitis by the end of a two-week treatment period in adult patients with mild-to-moderate disease. Both inactive (control) and active (TiO2 semi-conductor) versions of the Soladey toothbrushes significantly increased crevice fluid flow.

**Key Words**

toothbrush, ionic toothbrush, titanium dioxide semiconductor