Comparative Plaque Removal Efficacy of Two New Powered Toothbrushes and a Manual Toothbrush

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Abstract

- **Objective:** The purpose of this study was to determine the plaque-reducing effectiveness of two new powered toothbrushes and compare them to a manual toothbrush control.

- **Methods:** This examiner-blind, randomized study used a crossover design. Sixty-five qualifying male and female subjects were randomly assigned one of the two test powered brushes (Spinbrush™ Truly Radiant™ Deep Clean [TRDC] or Spinbrush™ Truly Radiant™ Extra Whitening [TREW], Church & Dwight Co., Inc., Princeton, NJ, USA) or an ADA standard manual toothbrush (MT; American Dental Association, Chicago, IL, USA) according to one of three computer-generated sequences. Following instruction in the use of their assigned toothbrush, subjects brushed at home with a standard fluoride toothpaste twice daily for two minutes during a one-week familiarization period. At the end of this period, the subjects returned to the study site after refraining from oral hygiene for 12–16 hours, and from eating, drinking, and smoking for four hours. Plaque was scored using the Rustogi Modification of the Navy Plaque Index. Subjects brushed under supervision with their assigned toothbrush for two minutes, and plaque was rescored. They were then given one of the alternate toothbrushes according to their assigned sequence, and the familiarization routine and evaluation processes were repeated until each of the subjects used each of the three brushes.

- **Results:** Within-group analyses showed that all three toothbrushes produced statistically significant reductions from the pre-brushing baseline in whole mouth and regional plaque scores (p < 0.001), with respective whole mouth reductions of 17.9%, 42.3%, and 38.1% for MT, TRDC, and TREW. Between-group analyses showed that TRDC and TREW were each significantly more effective (p < 0.001) than MT, as each showed at least twice as much of a reduction in whole mouth scores. Both of the powered brushes also produced statistically significantly greater reductions than the manual brush at each of the twelve subsets of sites examined, with the greatest differences at interproximal sites and sites presenting access difficulty, such as those in the lingual posterior region. Additionally, TRDC produced a statistically significant 11.5% greater reduction than TREW (p = 0.001) in whole mouth plaque scores, and statistically significantly greater reductions in two of the subsets evaluated.

- **Conclusion:** Both of the powered brushes tested proved to be safe and significantly more effective than the standard manual control brush in reducing plaque. While the finding that the TRDC was significantly more effective than the TREW in reducing whole mouth plaque and plaque in two subsets demonstrates that small differences in toothbrush design may impact performance, longer-term studies would be needed to assess the extent to which this translates to meaningful clinical outcomes.

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