Laboratory Evaluation of Extrinsic Stain Removal by a Specially Engineered Sonic Electric Toothbrush with Unique Sensing and Control Technologies

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Submitted for publication to The Journal of Clinical Dentistry, 2012.
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Study Objective
The objective of this laboratory study was to evaluate extrinsic stain removal efficacy of a specially engineered sonic electric toothbrush with unique sensing and control technologies as compared to a commercially available manual flat-trim toothbrush.

Trial Conditions and Methods

Products Under Investigation

Test Toothbrush 1: Colgate® ProClinical® A1500 Electric Toothbrush with Triple Clean Brush Head (Colgate-Palmolive Company, New York, NY)

Test Toothbrush 2: Colgate® ProClinical® A1500 Electric Toothbrush with Sensitive Brush Head (Colgate-Palmolive Company, New York, NY)

Manual flat-trim toothbrush: Oral B® Indicator® Toothbrush (Procter & Gamble Company, Cincinnati, OH)

Methods

Stained dental enamel blocks were mounted in resin and stained using a staining broth containing coffee, tea, mucin, soy broth, and Sarcina Lutea. The amount of stain was quantified by measuring the light reflected from the surface of the tooth with a spectrophotometer based on a whitening index which is a calculation of how far a given color is from white light.

Thirty-six teeth were sorted into three groups so that the distribution of and average baseline whitening index values for each group were balanced. The brushing study was conducted using a V-8 mechanical cross-brushing machine. For the electric toothbrushes, the brushing machine was adjusted to 150 grams of pressure, while the machine was adjusted to 250 grams of pressure for the manual toothbrush. Each tooth was immersed in a toothpaste slurry consisting of 25 grams of Crest Cavity Protection (Procter & Gamble Company, Cincinnati, OH) toothpaste and 40 milliliters of deionized water. The electric toothbrushes were set to the optimum mode. The teeth were brushed for 800 double strokes, rinsed with deionized water, and removed from the brushing machine. The teeth were air dried for 30 minutes and then three measurements were taken of each tooth with the spectrophotometer. Next, the
remaining stain was removed from each tooth by applying a dental prophylaxis treatment. This final prophylaxis procedure provided a value for the maximum amount of the extrinsic stain that potentially could be removed from each tooth. The difference between the pre-test and post-test measurements represents the ability of the test toothbrushes to remove stain, signifying that a tooth has actually become whiter.

**Results**

At baseline, there was no statistically significant differences amongst the three treatment groups. After toothbrushing, the sonic electric toothbrush with the Triple Clean and Sensitive brush heads demonstrated statistically significant improvements in stain removal as compared to the manual flat-trim toothbrush. Importantly, there were no statistically significant differences between the electric toothbrush with the Triple Clean and Sensitive brush heads.

**Conclusion**

A new specially engineered sonic electric toothbrush with Unique sensing and control technologies with either the Triple Clean or Sensitive brush head provides statistically significantly greater levels of stain removal in vitro as compared to a manual flat-trim toothbrush.