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Clinical evaluation of the effects of a sonic toothbrush with ultrasound waveguide in disrupting plaque with and without bristle contact.

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Abstract

PURPOSE: To assess the in vivo plaque removal efficacy of the newly marketed sonic/ultrasonic toothbrush. Plaque removal resulting from the toothbrush being held approximately 3 mm from the tooth surface was compared versus a no brushing control. Also, plaque removal resulting from the brush being used according to the manufacturer's instructions was compared versus a control of using the brush (with power turned off) like a manual toothbrush would be used.

METHODS: This was a replicate use, four-treatment, examiner-blind, randomized, eight-period crossover design single brushing plaque study involving 31 subjects. The four treatment regimens consisted of (1) brushing for 2 minutes with the Ultreo powered toothbrush according to manufacturer's instructions, (2) brushing for 2 minutes with the Ultreo toothbrush (power turned off) using the brush like a manual toothbrush, (3) having a trained dental hygienist hold the Ultreo toothbrush head 3 mm from tooth surfaces for a total of 2 minutes, or (4) swishing with a dentifrice slurry for 1 minute in the absence of toothbrushing. For each subject, an experienced, calibrated plaque examiner performed the Turesky Modified Quigley-Hein Plaque Index prior to brushing and following brushing. The difference (baseline minus post-regimen) in average scores was calculated for each subject. The difference scores were analyzed for treatment regimen differences using a mixed model ANCOVA (with baseline whole-mouth average score as the covariate and subjects considered random) for a crossover design.

RESULTS: Adjusted mean plaque removal scores (baseline plaque score minus post-brushing plaque score) were 0.052 for swishing with a dentifrice slurry, 0.058 for the dental hygienist holding the Ultreo toothbrush approximately 3 mm from tooth surfaces, 0.536 for the Ultreo toothbrush used according to manufacturer's instructions and 0.666 for the Ultreo toothbrush (power turned off) used like a manual toothbrush. The difference between the Ultreo toothbrush held approximately 3 mm from tooth surfaces and swishing with a dentifrice slurry was not statistically significant ($P = 0.808$). The adjusted mean plaque removal score for the Ultreo toothbrush (power turned off) used like a manual toothbrush was statistically significantly ($P < 0.001$) greater than the corresponding score for the Ultreo toothbrush used per manufacturer's instructions. Ultreo used like a manual toothbrush had an adjusted mean plaque removal score that was 12.4% greater than that for Ultreo used per manufacturer's instructions. Finally, plaque removal scores for the Ultreo toothbrush used per manufacturer's instructions and used like a manual toothbrush were statistically significantly ($P < 0.001$) greater than plaque removal scores for the non-brushing treatment regimens.

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