Powered toothbrushes show a modest benefit over manual toothbrushes

Are powered toothbrushes more effective than manual brushes at reducing levels of plaque and gingivitis in people who have normal manual dexterity?

Heanue M, Deacon SA, Deery C, et al. ***Manual versus powered toothbrushing for oral health (Cochrane Review). The Cochrane Library 2003; Issue 1. Oxford: Update Software***

Data sources Sources were the Cochrane Oral Health Group's Trials Register, the Cochrane Central Register of Controlled Trials, MEDLINE, EMbase and CINAHL. In addition, manufacturers of powered toothbrushes were contacted for further published and unpublished trials.

Study selection Trials were selected if there was random allocation of participants, they were conducted within the general public, subjects had uncompromised manual dexterity, and supervised manual and powered toothbrushing was compared for at least 4 weeks with the primary outcome of change in plaques and gingivitis over the period.

Data extraction and synthesis Six reviewers independently extracted information in duplicate. Indices for plaque and gingivitis were expressed as standardised values for each study. The effect measure for each meta-analysis was the standardised mean difference with the appropriate 95% confidence intervals using random-effect models. Potential sources of heterogeneity were examined, along with sensitivity analyses for the items assessed for quality and publication bias.

Results A total of 29 trials (including 2547 participants) provided data for the meta-analysis. Brushes that worked with a rotation–oscillation action removed more plaque and reduced gingivitis more effectively than manual brushes in the short- and long-term (Figure 1). At 3 months this represented an 11% reduction in plaque and a 6% reduction in gingivitis. At over 3 months there was a 7% reduction in plaque and a 17% reduction in gingivitis. Sensitivity analyses revealed the results to be robust when selecting trials of high quality. There was no evidence of any publication bias.

Conclusions Powered toothbrushes with a rotation–oscillation action achieve a significant, though modest, reduction in plaque and gingivitis compared with manual toothbrushing. Observation of methodological guidelines and greater standardisation of design would benefit both future trials and meta-analyses.

Commentary

This Cochrane Review was noteworthy for three reasons. First, international standards were used to systematically examine over 30 years of published studies. Second, and surprisingly, the work indicated that only one type of electric toothbrush demonstrated a statistically significant, though modest, clinical benefit over manual toothbrushes. Further, this benefit improved with longer use. Third, recently developed battery-powered brushes were not evaluated because all published studies were less than 28 days.

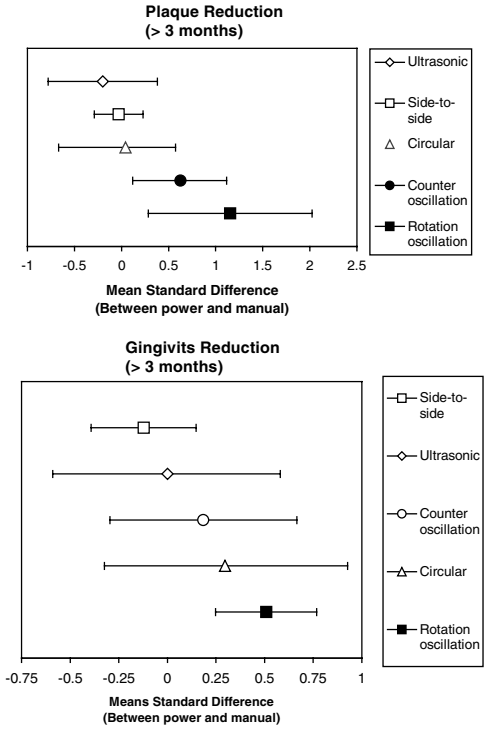

Figure 1

These results suggest that clinicians, if they recommend power toothbrushes, might consider the overall benefit as demonstrated in longer-term clinical trials. The results also indicate that most manufacturers will need to improve their clinical trial conduct to meet international standards. Finally, it will be important to demonstrate the impact of power toothbrushing on reducing incidence and prevalence of caries and periodontal disease.

Richard Niederman
Centre for Evidence-based Dentistry, Forsyth Institute, Boston, MA, USA

Evidence-Based Dentistry (2003) **4,** 26.
doi:10.1038/sj.ebd.6400172

Address for correspondence: Emma Tavender, Review Group Co-ordinator, Cochrane Oral Health Group, University Dental Hospital of Manchester, Higher Cambridge Street, Manchester M15 6FH, UK. E-mail: emma.tavender@man.ac.uk