

Powered toothbrushes are more effective than manual toothbrushes in reducing gingival bleeding or inflammation

If people have gingivitis and periodontitis, are powered toothbrushes more effective than manual toothbrushes in reducing bleeding and inflammation?

Sicilia A, Arregui I, Gallego M, Cabezas B, Cuesta S. *A systematic review of powered vs. manual toothbrushes in periodontal cause-related therapy.* *J Clin Periodontol* 2002; 29(Suppl. 3):S39–S54

Data sources Data sources were MEDLINE and the Cochrane Oral Health Group Trials Register, with additional hand searches of reference lists from relevant articles and of selected journals dated up to June 2001. Only English-language publications were included.

Study selection Randomised controlled trials were selected that compared the efficacy of dental hygiene with an electric or conventional manual toothbrush in the treatment of gingivitis. Criteria applied to patients enrolled in the trials were that they had to be older than 15 years of age at the beginning of the study, have gingivitis or periodontitis, not be handicapped, and did not have dental implants, extensive prosthetic restoration nor orthodontic treatment.

Data extraction and synthesis Information regarding the studies' quality and characteristics was extracted independently by two reviewers. Kappa scores determined their agreement. Because of the heterogeneity in the identified studies only a qualitative summary of the data was conducted.

Results A group of 21 studies was finally included. Ten studies showed a greater reduction of gingival bleeding or inflammation when power-driven toothbrushes were used by subjects. This effect appears to be related to the capacity to reduce plaque, and is more evident in counter-rotational and oscillating–rotating brushes. No firm evidence was found for higher efficacy of sonic brushes. In short-term studies with prophylaxis after initial examination, no significant differences were found, independent of the type of powered toothbrush tested.

Conclusions The use of powered toothbrushes, especially counter-rotational and oscillating–rotating brushes, can be beneficial in reducing the levels of gingival bleeding or inflammation. Future studies in this field need greater methodological homogeneity to enable quantitative analysis.

Commentary

This systematic review, together with the Cochrane Review on the same topic,¹ substantiates the finding that only two powered toothbrushes are more effective than manual toothbrushes. In the current study only the oscillating–rotating [Braun, AG, Germany] and counter-rotational [Interplak-Interplak Conair Corporation, Stamford, CT] powered brushes were found to be more effective than manual brushes in reducing gingival bleeding or inflammation. In the Cochrane Review the same two brushes were the only ones able to reduce plaque more than manual brushes. Interestingly, in contrast with the current review, the Cochrane Review found that only the oscillating–rotating brush significantly reduced

gingivitis. Thus, two independent systematic reviews reported similar results.

These results are both newsworthy and controversial. In the week following the Cochrane Review's release, more than 100 international news reports referred to the story.² This media interest is not surprising given that in the US, 42% of adults and 34% of teenagers view toothbrushes as an invention they cannot live without (see the Massachusetts Institute of Technology Invention Index Survey at mit.edu/invent/n-pressreleases/n-press-03index.html).

These results are also controversial from a consumer and a business perspective. For a consumer, is a five- to 10-fold or even 20-fold increase in the price of a toothbrush a good investment? From a manufacturer's perspective, having invested millions in development, do these results undermine the value of the product?

The answers to these questions do not hinge on the validity or reliability of the systematic reviews (both of which are stellar). Rather, they depend on clinical importance. Are the clinical differences important enough for the patient to use or the clinician to recommend these powered toothbrushes? Are the clinical differences important enough for healthcare agencies and insurers to recommend and pay for these power toothbrushes? These questions must be, and will be answered individually.

The most important unanswered question is whether reductions in plaque and gingival inflammation truly reduce the risk of caries and periodontal disease. Answering this will take considerably more work.

Practice point

- Powered toothbrushes, especially counter-rotational and oscillating–rotating brushes, are more effective than manual brushes in reducing gingival bleeding or inflammation.

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2. Niederman R, Richards D, Matthews D, Shugars D, Worthington H, Shaw W. International standards for clinical trial conduct and reporting. *J Dent Res* 2003; 82:415–416.

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