



Cochrane
Library

Cochrane Database of Systematic Reviews

Manual versus powered toothbrushing for oral health (Review)

Robinson P, Deacon SA, Deery C, Heanue M, Walmsley AD, Worthington HV, Glenny AM, Shaw BC

Robinson P, Deacon SA, Deery C, Heanue M, Walmsley AD, Worthington HV, Glenny AM, Shaw BC.

Manual versus powered toothbrushing for oral health.

Cochrane Database of Systematic Reviews 2005, Issue 2. Art. No.: CD002281.

DOI: 10.1002/14651858.CD002281.pub2.

www.cochranelibrary.com

Manual versus powered toothbrushing for oral health (Review)

Copyright © 2009 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

WILEY

[Intervention Review]

Manual versus powered toothbrushing for oral health

Peter Robinson¹, Scott A Deacon², Chris Deery³, Mike Heanue⁴, A Damien Walmsley⁵, Helen V Worthington⁶, Anne-Marie Glenny⁷, Bill C Shaw⁶

¹Department of Dental Public Health, School of Clinical Dentistry, Sheffield, UK. ²South West Cleft Unit, Frenchay Hospital, Bristol, UK. ³Department of Paediatric Dentistry, Edinburgh Dental Institute, Edinburgh, UK. ⁴Dental Surgery, Private Dental Practice, Sheffield, UK. ⁵Department of Prosthetic Dentistry, School of Dentistry, Birmingham, UK. ⁶Cochrane Oral Health Group, MANDEC, School of Dentistry, The University of Manchester, Manchester, UK. ⁷Cochrane Oral Health Group, MANDEC, School of Dentistry, The University of Manchester, Manchester, UK

Contact address: Peter Robinson, Department of Dental Public Health, School of Clinical Dentistry, University of Sheffield, Claremont Crescent, Sheffield, S10 2TA, UK. peter.g.robinson@sheffield.ac.uk.

Editorial group: Cochrane Oral Health Group.

Publication status and date: Edited (no change to conclusions), published in Issue 1, 2009.

Citation: Robinson P, Deacon SA, Deery C, Heanue M, Walmsley AD, Worthington HV, Glenny AM, Shaw BC. Manual versus powered toothbrushing for oral health. *Cochrane Database of Systematic Reviews* 2005, Issue 2. Art. No.: CD002281. DOI: 10.1002/14651858.CD002281.pub2.

Copyright © 2009 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

ABSTRACT

Background

Removing dental plaque may play a key role maintaining oral health. There is conflicting evidence for the relative merits of manual and powered toothbrushing in achieving this.

Objectives

To compare manual and powered toothbrushes in relation to the removal of plaque, the health of the gingivae, staining and calculus, dependability, adverse effects and cost.

Search methods

We searched the Cochrane Oral Health Group Trials Register (to July 2004) and CENTRAL (*The Cochrane Library* 2004, Issue 2); MEDLINE (January 1966 to week 2 June 2004); EMBASE (January 1980 to week 2 2004) and CINAHL (January 1982 to week 2 June 2004). Manufacturers were contacted for additional data.

Selection criteria

Trials were selected for the following criteria: design-random allocation of participants; participants - general public with uncompromised manual dexterity; intervention - unsupervised manual and powered toothbrushing for at least 4 weeks. Primary outcomes were the change in plaque and gingivitis over that period.

Data collection and analysis

Six authors independently extracted information. The effect measure for each meta-analysis was the standardised mean difference (SMD) with 95% confidence intervals (CI) using random-effects models. Potential sources of heterogeneity were examined, along with sensitivity analyses for quality and publication bias. For discussion purposes SMD was translated into percentage change.

Manual versus powered toothbrushing for oral health (Review)

Copyright © 2009 The Cochrane Collaboration. Published by John Wiley & Sons, Ltd.

WILEY

Main results

Forty-two trials, involving 3855 participants, provided data.

Brushes with a rotation oscillation action removed plaque and reduced gingivitis more effectively than manual brushes in the short term and reduced gingivitis scores in studies over 3 months. For plaque at 1 to 3 months the SMD was -0.43 (95% CI: -0.72 to -0.14), for gingivitis SMD -0.62 (95% CI: -0.90 to -0.34) representing an 11% difference on the Quigley Hein plaque index and a 6% reduction on the Löe and Silness gingival index. At over 3 months the SMD for plaque was -1.29 (95% CI: -2.67 to 0.08) and for gingivitis was -0.51 (-0.76 to -0.25) representing a 17% reduction on the Ainamo Bay bleeding on probing index. There was heterogeneity between the trials for the short-term follow up. Sensitivity analyses revealed the results to be robust when selecting trials of high quality. There was no evidence of any publication bias.

No other powered designs were as consistently superior to manual toothbrushes.

Cost, reliability and side effects were inconsistently reported. Any reported side effects were localised and temporary.

Authors' conclusions

Powered toothbrushes with a rotation oscillation action reduce plaque and gingivitis more than manual toothbrushing.

Observation of methodological guidelines and greater standardisation of design would benefit both future trials and meta-analyses.

PLAIN LANGUAGE SUMMARY

Manual versus powered toothbrushing for oral health

When compared to manual toothbrushes, powered toothbrushes with a rotation oscillation action provide protection against gum inflammation in the long and short term and better plaque removal in the short term.

Removing dental plaque by toothbrushing helps prevent gum inflammation (gingivitis). Toothbrushing with a fluoride toothpaste prevents tooth decay.

Powered toothbrushes simulate manual toothbrushing in different ways (such as moving side to side or circular motions). The review of trials found that only rotation oscillation (where brush heads rotate in one direction and then the other) is better than manual toothbrushes at removing plaque and reducing gum inflammation, and is no more likely to cause injuries to gums. Long-term benefits of this for dental health are unclear.