Powered toothbrush plus triclosan only as effective as manual brush and fluoride toothpaste for periodontal maintenance patients

In periodontal maintenance patients, does a rotation–oscillation action powered toothbrush and triclosan-containing dentifrice result in superior clinical periodontal conditions than with manual toothbrushing and a regular dentifrice?

Bogren A, Teles RP, Torresyap G, et al.
Long-term effect of the combined use of powered toothbrush and triclosan dentifrice in periodontal maintenance patients. J Clin Periodontol 2008; 35:157–164.

Design This randomised, controlled and single-masked clinical trial was carried out in specialist clinics in Sweden and the US.

Intervention The test group were instructed to use an rotation–oscillation action (ROA) powered toothbrush (Oral-B; Gillette, Boston, Massachusetts, USA) and a triclosan/ copolymer/ fluoride-containing dentifrice (Total; Colgate, Piscataway, New Jersey, US). The control group were instructed to brush using the modified Bass technique and a conventionally designed, multitufted, soft, manual toothbrush using a standard fluoride-containing dentifrice (Protection Caries; Colgate). Both groups were to brush twice a day and clean interdentally daily with dental floss, toothpicks and/ or interdental brushes.

Outcome measure Measurements were taken at baseline, and 1, 2 and 3 years for the following parameters: number of teeth, plaque, bleeding on probing (BoP), probing pocket depth (PPD) and level of the gingival margin (GM). GM was assessed as the distance between the soft tissue margin and the cemento–enamel junction or the border of a restoration. Relative attachment level (RAL) was calculated as PPD minus GM. Subgingival plaque samples were taken and analysed for their content of 40 bacterial species at each examination interval.

Results Both groups showed significant reduction in BoP, PPD and in mean total counts of the 40 bacterial species between baseline and 3 years, whereas plaque score and RAL remained almost unchanged. No significant differences between the two prevention programmes were found for any of the clinical outcome variables or in mean counts of the various bacterial species.

Conclusions The study failed to demonstrate superior clinical and microbiological effects of powered toothbrush and triclosan dentifrice compared with manual toothbrush and standard fluoride-dentifrice in periodontitis-susceptible subjects undergoing regular maintenance therapy.

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Commentary

Triclosan is a broad-spectrum antibacterial agent that is used in numerous household and healthcare-related products, including deodorants, soaps and toothpaste. It has significant anti-inflammatory properties[1,2] and, when combined with a copolymer, inhibits the growth of the plaque biofilm with good oral substantivity (persistence of action).[3] The clinical efficacy of the triclosan/ copolymer/ fluoride toothpaste in improving gingival health has been clearly demonstrated in over 2000 subjects from 14 independent, randomised, double-blind clinical studies.[4] Although the majority of these were studies were short-term and conducted in relatively healthy subjects, some randomised controlled trials of at least 3 years duration have demonstrated that this dentifrice significantly reduced the onset[5] and progression[6,7] of periodontal disease in individuals susceptible to the condition.

Similarly, powered toothbrushes with ROA heads have been shown to be more effective at plaque removal than manual brushes when used by people who have gingivitis and periodontitis.[8,9] One would logically presume that the combination of triclosan dentifrice with a powered brush would act complementarily but this study by Bogren and colleagues showed this may not be the case, at least in periodontal maintenance patients.

This was a well-designed, multicentre and multinational study in which randomisation allocation was concealed and data were analysed according to 'intention-to-treat'. So why are the results of this trial so different from the others? Certainly, this study design more closely reflected what occurs in real-life in private practice situations. Another explanation may come from how the outcomes were measured. The use of the outcome 'mean proportion of sites with an increased or decreased PPD of ≥2 mm' is more clinically meaningful than a difference in gingival index, or mean PPD after treatment. One of the problems with many periodontal trials is the use of mean PPD or attachment level. With four or six measurements per tooth in a study of 20 people with at least 10 teeth each, there would be at least 800 data points, making statistical significance much easier to prove.

The most important lesson from this study is not whether triclosan works, or whether powered toothbrushes are more effective than manual ones, but that the results published by Lindhe and Nyman over 20 years ago[10] are borne out once again. That is, with regular maintenance in a periodontal office, and reinforcement of oral hygiene procedures specific to each patient, periodontal health can be maintained even in people who have advanced attachment loss.

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Key to evidence graphic used in the Evidence-based Dentistry Journal

The graphic is based on the Centre for Evidence-based Medicine levels of Evidence tables www.cebm.net/levels_of_evidence.asp (see Evidence-based Dentistry 2003;**4**: p 17–18)

Evidence Graphic	Evidence Level	Therapy/Prevention/ Aetiology/Harm
3A **2C** **2B** **2A** **1B** **1A**	1A	SR (with homogeneity*) of RCTs
3A **2C** **2B** **2A** **1B** 1A	1B	Individual RCT (with narrow Confidence Interval)
3A **2C** **2B** **2A** 1B 1A	2A	SR (with homogeneity*) of cohort studies
3A **2C** **2B** 2A 1B 1A	2B	Individual cohort study (including low quality RCT; e.g. <80% follow-up)
3A **2C** 2B 2A 1B 1A	2C	Ecological studies
3A 2C 2B 2A 1B 1A	3A	SR (with homogeneity*) of case-control studies

* By homogeneity we mean a systematic review that is free of worrisome variations (heterogeneity) in the directions and degrees of results between individual studies. Not all systematic reviews with statistically significant heterogeneity need be worrisome, and not all worrisome heterogeneity need be statistically significant.