

Insufficient evidence that slow-release fluoride devices reduce caries

Abstracted from

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Slow-release fluoride devices for the control of dental decay. *Cochrane Database Syst Rev* 2014; **11**: Art. No. CD005101. DOI: 10.1002/14651858.CD005101.pub3.

Address for correspondence: Luisa Fernandez Mauleffinch, Managing Editor, Cochrane Oral Health Group, School of Dentistry, The University of Manchester, JR Moore Building, Oxford Road, Manchester, M13 9PL, UK. E-mail: luisa.fernandez@manchester.ac.uk

Question: Are slow-release fluoride devices effective for caries prevention?

Data sources Cochrane Oral Health Group's Trials Register, Cochrane Central Register of Controlled Trials (CENTRAL), Medline, Embase, US National Institutes of Health Trials Register and World Health Organisation (WHO) International Clinical Trials Registry Platform.

Study selection Parallel randomised controlled trials (RCTs) of any type of slow-release fluoride device irrespective of publication status, language or blinding were considered. Split mouth studies were excluded.

Data extraction and synthesis Standard Cochrane methods were followed with at least two reviewers independently undertaking all the key steps.

Results Only one trial which was considered to be at high risk of bias was included. The trial included 174 children with 132 available for two year examination. However statistical analysis was performed on only the 63 children (31 in intervention group, 32 in control group) who had retained the beads (retention rate was 47.7% at two years). Among these 63 children, caries increment was reported to be statistically significantly lower in the intervention group than in the control group (DMFT: mean difference -0.72, 95% confidence interval (CI) -1.23 to -0.21; DMFS: mean difference -1.52, 95% CI -2.68 to -0.36 (very low quality evidence)). Although this difference was clinically significant, it only holds true for those children who retained the fluoride beads; over 50% of the children did not retain the beads. Adverse effects were not reported.

Conclusions There is insufficient evidence to determine the caries-inhibiting effect of slow-release fluoride glass beads. The body of evidence available is of very low quality and there is a potential overestimation of benefit to the average child. The applicability of the findings to the wider population is unclear; the study had included children from a deprived area that had low levels of fluoride in drinking water, and were considered at high risk of caries. In addition, the evidence was only obtained from children who still had the bead attached at two years (48% of all available children); children who had lost their slow-release fluoride devices earlier might not have benefited as much from the devices.

Commentary

The value of topical fluorides in preventing tooth decay is well recognised^{1,2} and the prospect of a slow-release, more sustained presence of fluoride in the oral cavity is enticing. This review is an update of an original review published in 2006. While the search has been updated, no additional studies have been identified so only a single randomised controlled trial was included.

The trial involved 174 children and compared a slow-release fluoride device (glass beads with fluoride were attached to buccal surfaces of right maxillary first permanent molar teeth) against a placebo bead. Unfortunately a large proportion of the glass beads were dislodged giving a total loss to follow up of 64%; this together with the selective reporting of only those children with retained beads at two years means that the study is at high risk of bias.

While a range of different topical fluoride delivery systems are available (toothpastes, varnishes, gels, mouthwashes and tablets) the focus of recent evidence-based guidelines (eg SIGN³) has been towards recommending at least twice daily toothbrushing with a fluoride-containing paste and the use of fluoride varnish. While the authors of the included paper have suggested that the bead was cost effective,⁴ it would be interesting to compare costs with newer fluoride varnish programmes such as Childsmile (www.child-smile.org) that are targeted at those from more deprived sections of the community, and administration is recorded.

Derek Richards

Centre for Evidence-based Dentistry, Dental Health Services Research Unit, University of Dundee, Dundee, Scotland, UK

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This paper is based on a Cochrane Review published in the Cochrane Library 2014, issue 11 (see www.thecochranelibrary.com for information). Cochrane Reviews are regularly updated as new evidence emerges and in response to feedback, and the Cochrane Library should be consulted for the most recent version of the review.