Glass-ionomer restoratives: a systematic review of a secondary caries treatment effect  
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Authors' objectives  
To review the evidence for the ability of glass-ionomer restoratives to inhibit secondary caries at the restoration margin.

Searching  
MEDLINE and EMBASE were searched from 1970 to May 1996. Databases held by the dental school libraries of Nijmegen and Gothenburg Universities were also searched. Keywords searched for were "clinical trial", "clinical evaluation“, "in vivo", "glass ionomer", and "glass polyalkenoate". Some handsearching of journals was carried out (no further information provided). Searches were made for both English and non-English language publications. Bibliographies of included studies were searched for further references.

Study selection  
Study designs of evaluations included in the review  
Studies with a prospective design and appropriate control treatment.

Specific interventions included in the review  
Glass-ionomer restoratives. Control treatment of either an amalgam or a composite restoration. Evaluations of restorations of fluoride-releasing composites and fluoride-releasing amalgams were omitted.

Participants included in the review  
Dental patients undergoing glass-ionomer, or amalgam or composite restorations.

Outcomes assessed in the review  
Incidence of secondary caries.

How were decisions on the relevance of primary studies made?  
The authors do not state how the papers were selected for the review, or how many of the authors performed the selection.

Assessment of study quality  
The authors produced a systematic assessment list to evaluate the papers selected for the review. Studies were assessed for: prospective follow-up, stated aim, choice of sample size, source of patient sample, inclusion/exclusion criteria, use of appropriate control, randomisation, description of method of randomisation, more than one examiner for direct clinical evaluations, examiner calibration, report on patient loss, follow-up, and report on whether protocol deviation had occurred. The authors do not state how the papers were assessed for validity, or how many of the authors performed the validity assessment.

Data extraction  
The authors do not state how the data were extracted for the review, or how many of the authors performed the data extraction.

Methods of synthesis  
How were the studies combined?  
Studies were grouped into the following four categories:

Category 1: No secondary caries in the glass-ionomer group; secondary caries present in control group.
Category 2: No secondary caries in either the glass-ionomer or control group.

Category 3: Secondary caries in the glass-ionomer group; no secondary caries in control groups.

Category 4: Secondary caries present in both glass-ionomer and control groups.

How were differences between studies investigated?
A sensitivity analysis was conducted by including only high-caries risk studies or only large-sample size studies.

Results of the review
Twenty-eight studies were included in the review. A total of 3965 participants were included in these studies.

Five studies were of category 1, 10 were of category 2, 4 were of category 3, and 10 were of category 4.

Authors’ conclusions
No overall evidence for or against a treatment effect of inhibition of secondary caries by glass-ionomer restoratives was obtained.

CRD commentary
A reasonable review of the area. A comprehensive literature search was conducted although the authors did not attempt to identify unpublished studies. The authors do not state how studies were assessed for relevance and how and what data was extracted from the included studies, no information on the characteristics of the participants included in the studies was provided. Inclusion and exclusion criteria were stated, and individual study results were presented in a clearly laid out table. Although an appropriate validity assessment was discussed the authors do not state how the validity criteria were applied and do not present the results of the validity assessment. The analysis used was basic and the review would have benefited from a more statistical approach. Risk differences (this measure would be more appropriate than relative risks due to the large number of treatment arms in the included studies in which no caries occurred) for the difference in secondary caries incidence between treatment and control groups could have been calculated and then standard meta-analytic techniques could have been used to investigate heterogeneity and pool the study results. Based on the limited analysis presented in the review it is difficult to make any conclusion or to determine whether the author's conclusions are justified based on the results presented.

Implications of the review for practice and research
The authors state that there is a need for appraisal of the methodology currently adopted for the clinical evaluation of glass-ionomer restorative materials and its further development for the support of future systematic reviews.

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