Caries-preventive effect of resin-based and glass ionomer sealants over time: a systematic review

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CRD summary
The authors concluded that there was no consistent evidence to determine the superiority of either resin-based or glass ionomer sealant materials for the prevention of caries development. The data presented appear to support the authors’ conclusion, but the limited search and lack of a quality assessment of the included studies make it difficult to comment on the reliability of the conclusion.

Authors' objectives
To compare the effects of resin-based and glass ionomer sealant materials for the prevention of caries.

Searching
MEDLINE/PubMed was searched using the reported search terms to December 2004. In addition, the reference lists of a previous Cochrane review (see Other Publications of Related Interest) and identified studies were screened. Only studies published in English were included.

Study selection
Study designs of evaluations included in the review
Randomised controlled trials (RCTs) with at least one year of follow-up were eligible for inclusion. All of the included studies were of split-mouth design. The duration of follow-up ranged from one to seven years.

Specific interventions included in the review
Studies that compared resin-based with glass ionomer sealant materials were eligible for inclusion. The included studies compared auto-cured resin composite with low-viscosity glass ionomer cement, light-cured resin composite with low-viscosity glass ionomer cement, auto-cured resin composite with medium-viscosity glass ionomer cement, and light-cured resin composite with low-viscosity resin-modified glass ionomer cement.

Participants included in the review
Inclusion criteria were not specified for the participants. No details of the participants were reported.

Outcomes assessed in the review
Studies that assessed caries prevention at the surface level were eligible for inclusion. Studies had to report sufficient statistical data to enable the calculation of a relative risk or attributable risk.

How were decisions on the relevance of primary studies made?
Two reviewers independently selected the studies.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two reviewers independently extracted the numbers of patients with the outcomes of interest from contingency tables presented in primary studies. Any disagreements were resolved by consultation with a biostatistician. Standard errors were estimated for studies that only reported marginal totals (the methods were reported). For each reported follow-up period within a study, the incidence of caries in sealed surfaces was presented by treatment group, together with the attributable risk and corresponding 95% confidence interval.

Methods of synthesis
How were the studies combined?
The studies were grouped according to the treatments being compared and combined in a narrative, with an accompanying table.

How were differences between studies investigated?
Differences between the studies were discussed in the text.

Results of the review
Twelve RCTs were included. The number of patients was not reported.

The results were only homogeneous for the light-cured resin composite versus the low-viscosity resin-modified glass ionomer cement comparison (two studies). The authors stated that both studies reported statistically significantly increased preventive effects with light-cured resin composite at two and three years' follow-up.

Most studies compared light and auto-cured resin composite with low-viscosity glass ionomer cement. Two of these 6 studies reported a significant difference between treatments: one favoured low-viscosity glass ionomer cement and the other favoured auto-cured resin composite.

Four studies had follow-up greater than three years. Two studies reported a statistically significant increased preventive effect with resin composite compared with glass ionomer cement.

Authors' conclusions
There was no consistent evidence to determine the superiority of either resin-based or glass ionomer sealant materials for the prevention of caries development.

CRD commentary
The review addressed a clear question that was defined in terms of the intervention, outcomes and study design. Inclusion criteria were not defined for the participants. Limiting the search to English language reports identified in one database and one previous review raises the potential for publication and language bias, and might have resulted in the omission of other relevant studies. Methods were used to minimise reviewer error and bias in the study selection and data extraction processes. Since study validity was not assessed, the results from these studies and any synthesis might not be reliable. There were no details of the participants in the included studies, thus it may be difficult to generalise the review findings. In view of the differences between studies, a narrative synthesis was appropriate. The data presented appear to support the authors' conclusion, but the limited search, limited details and lack of a quality assessment of the included studies make commenting on the reliability of the conclusions difficult.

Implications of the review for practice and research
Practice: The authors did not state any implications for practice.

Research: The authors stated that it may be helpful to compare retention and caries-prevention effects of high-viscosity glass polymers applied by the ART (atraumatic restorative treatment) procedure, using finger pressure with resin-composite sealants, in a well-designed study.

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Other publications of related interest

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Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.