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[Intervention Review]

Rubber dam isolation for restorative treatment in dental patients

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ABSTRACT

Background

Successful restorations in dental patients depend largely on the effective control of moisture and microbes during the procedure. The rubber dam technique has been one of the most widely used isolation methods in dental restorative treatments. The evidence on the effects of rubber dam usage on the longevity of dental restorations is conflicting. Therefore, it is important to summarise the available evidence to determine the effects of this method.

Objectives

To assess the effects of rubber dam isolation compared with other types of isolation used for direct and indirect restorative treatments in dental patients.

Search methods

We searched the following electronic databases: Cochrane Oral Health's Trials Register (searched 17 August 2016), Cochrane Central Register of Controlled Trials (CENTRAL; 2016, Issue 7) in the Cochrane Library (searched 17 August 2016), MEDLINE Ovid (1946 to 17 August 2016), Embase Ovid (1980 to 17 August 2016), LILACS BIREME Virtual Health Library (Latin American and Caribbean Health Science Information database; 1982 to 17 August 2016), SciELO BIREME Virtual Health Library (1998 to 17 August 2016), Chinese BioMedical Literature Database (CBM, in Chinese) (1978 to 30 August 2016), VIP (in Chinese) (1989 to 30 August 2016), and China National Knowledge Infrastructure (CNKI, in Chinese) (1994 to 30 August 2016). We searched ClinicalTrials.gov and the [World Health Organization International Clinical Trials Registry Platform](http://www.who.int/trials/registry/), OpenGrey and Sciencepaper Online (in Chinese) for ongoing trials. There were no restrictions on the language or date of publication when searching the electronic databases.

Selection criteria

We included randomised controlled trials (including split-mouth trials) assessing the effects of rubber dam isolation for restorative treatments in dental patients.

Data collection and analysis

Two review authors independently screened the results of the electronic searches, extracted data and assessed the risk of bias of the included studies. We resolved disagreement by discussion.

Main results

We included four studies that analysed 1270 participants (among which 233 participants were lost to follow-up). All the included studies were at high risk of bias. We excluded one trial from the analysis due to inconsistencies in the presented data.

The results indicated that dental restorations had a significantly higher survival rate in the rubber dam isolation group compared to the cotton roll isolation group at six months in participants receiving composite restorative treatment of non-carious cervical lesions (risk ratio (RR) 1.19, 95% confidence interval (CI) 1.04 to 1.37, very low-quality evidence). It also showed that the rubber dam group had a lower risk of failure at two years in children undergoing proximal atraumatic restorative treatment in primary molars (hazard ratio (HR) 0.80, 95% CI 0.66 to 0.97, very low-quality evidence). One trial reported limited data showing that rubber dam usage during fissure sealing might shorten the treatment time. None of the included studies mentioned adverse effects or reported the direct cost of the treatment, or the level of patient acceptance/satisfaction. There was also no evidence evaluating the effects of rubber dam usage on the quality of the restorations.

Authors' conclusions

We found some very low-quality evidence, from single studies, suggesting that rubber dam usage in dental direct restorative treatments may lead to a lower failure rate of the restorations, compared with the failure rate for cotton roll usage. Further high quality research evaluating the effects of rubber dam usage on different types of restorative treatments is required.

PLAIN LANGUAGE SUMMARY

Does isolating the site of a dental restoration during treatment improve the performance of the restoration?

Review question

This review examined whether different isolation methods affect the performance of dental restorations.

Background

Restorative dental treatments are used to repair damage to teeth caused by tooth decay or accidents. Creating a physical barrier around a treatment site to reduce contamination of the site with saliva is a common practice. Reducing the amount of saliva in the area may enable the materials used for repair to bond together more effectively, improving the performance and reliability of the restoration. It may also reduce exposure to bacteria in the mouth.

Two methods of creating a barrier are commonly used; either a rubber dam around the tooth or cotton rolls together with suction to remove excess saliva. The rubber dam method involves using a sheet of latex in a frame. A small hole is made in the sheet and it is placed over the tooth to be treated creating a barrier around it. Using a rubber dam can isolate the tooth from the rest of the person's mouth, which allows the tooth to be repaired dry and with relatively less exposure to bacteria in the mouth. A common alternative method of isolation of the tooth is the use of cotton rolls combined with the removal of excess saliva by suction. The evidence on the effects of rubber dam usage versus cotton roll usage is conflicting.

Study characteristics

The evidence in this review, which was carried out together with Cochrane Oral Health, is up-to-date as of 17 August 2016. We included four studies that evaluated 1037 participants, mostly children, who were undergoing different types of dental restorative treatments, using materials which require effective moisture control to reduce failure rates. For example, fissure sealing, resin or composite fillings at the gum margin, and proximal atraumatic restorative treatment in primary molars. All of the included studies compared the use of rubber dam and cotton rolls as two different isolation methods.

Key results

There is some evidence to suggest that the use of a rubber dam may increase the survival time of dental restorations compared to the use of cotton rolls as an isolation method.

The studies did not include possible side effects.

Quality of the evidence

The evidence presented is of very low quality due to the small amount of available studies, uncertain results and problems related to the way in which the available studies were conducted.