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[Intervention Review]

# Local interventions for the management of alveolar osteitis (dry socket)

Blánaid Daly<sup>1</sup>, Mohammad O Shari<sup>2</sup>, Tim Newton<sup>3</sup>, Kate Jones<sup>4</sup>, Helen V Worthington<sup>5</sup>

<sup>1</sup>Dental Practice & Policy, King's College London Dental Institute, London, UK. <sup>2</sup>School of Dentistry, The University of Manchester, Manchester, UK. <sup>3</sup>Division of Health and Social Care Research, KCL Dental Institute, London, UK. <sup>4</sup>NHS Sheffield, Sheffield, UK. <sup>5</sup>Cochrane Oral Health Group, School of Dentistry, The University of Manchester, Manchester, UK

Contact address: Blánaid Daly, Dental Practice & Policy, King's College London Dental Institute, Denmark Hill Campus, Bessemer Road, London, SE5 9RW, UK. [blanaid.daly@kcl.ac.uk](mailto:blanaid.daly@kcl.ac.uk).

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## ABSTRACT

### Background

Alveolar osteitis (dry socket) is a complication of dental extractions and occurs more commonly in extractions involving mandibular molar teeth. It is associated with severe pain developing 2 to 3 days postoperatively, a socket that may be partially or totally devoid of blood clot and in some patients there may be a complaint of halitosis. It can result in an increase in postoperative visits.

### Objectives

To assess the effects of local interventions for the prevention and treatment of alveolar osteitis (dry socket) following tooth extraction.

### Search methods

The following electronic databases were searched: the Cochrane Oral Health Group Trials Register (to 29 October 2012), the Cochrane Central Register of Controlled Trials (CENTRAL) (*The Cochrane Library* 2012, Issue 10), MEDLINE via OVID (1946 to 29 October 2012) and EMBASE via OVID (1980 to 29 October 2012). There were no restrictions regarding language or date of publication. We also searched the reference lists of articles and contacted experts and organisations to identify any further studies.

### Selection criteria

We included randomised controlled trials of adults over 18 years of age who were having permanent teeth extracted or who had developed dry socket post-extraction. We included studies with any type of local intervention used for the prevention or treatment of dry socket, compared to a different local intervention, placebo or no treatment. We excluded studies reporting on systemic use of antibiotics or the use of surgical techniques for the management of dry socket because these interventions are evaluated in separate Cochrane reviews.

### Data collection and analysis

Two review authors independently undertook risk of bias assessment and data extraction in duplicate for included studies using pre-designed proformas. Any reports of adverse events were recorded and summarised into a table when these were available. We contacted trial authors for further details where these were unclear. We followed The Cochrane Collaboration statistical guidelines and reported dichotomous outcomes as risk ratios (RR) and calculated 95% confidence intervals (CI) using random-effects models. For some of the split-mouth studies with sparse data it was not possible to calculate RR so we calculated the exact odds ratio instead. We used the GRADE tool to assess the quality of the body of evidence.

## Main results

Twenty-one trials with 2570 participants met the inclusion criteria; 18 trials with 2376 participants for the prevention of dry socket and three studies with 194 participants for the treatment of dry socket. The risk of bias assessment identified six studies at high risk of bias, 14 studies at unclear risk of bias and one studies at low risk of bias. When compared to placebo, rinsing with chlorhexidine mouthrinses (0.12% and 0.2% concentrations) both before and after extraction(s) prevented approximately 42% of dry socket(s) with a RR of 0.58 (95% CI 0.43 to 0.78;  $P < 0.001$ ) (four trials, 750 participants, moderate quality of evidence). The prevalence of dry socket varied from 1% to 5% in routine dental extractions to upwards of 30% in surgically extracted third molars. The number of patients needed to be treated with (0.12% and 0.2%) chlorhexidine rinse to prevent one patient having dry socket (NNT) was 232 (95% CI 176 to 417), 47 (95% CI 35 to 84) and 8 (95% CI 6 to 14) for control prevalences of dry socket of 1%, 5% and 30% respectively.

Compared to placebo, placing chlorhexidine gel (0.2%) after extractions prevented approximately 58% of dry socket(s) with a RR of 0.42 (95% CI 0.21 to 0.87;  $P = 0.02$ ) (two trials, in 133 participants, moderate quality of evidence). The number of patients needed to be treated with chlorhexidine gel to prevent one patient having dry socket (NNT) was 173 (95% CI 127 to 770), 35 (95% CI 25 to 154) and 6 (95% CI 5 to 26) for control prevalences of dry socket of 1%, 5% and 30% respectively.

A further 10 intrasocket interventions to prevent dry socket were each evaluated in single studies, and therefore there is insufficient evidence to determine their effects. Five interventions for the treatment of dry socket were evaluated in a total of three studies providing insufficient evidence to determine their effects.

## Authors' conclusions

Most tooth extractions are undertaken by dentists for a variety of reasons, however, all but three studies included in the present review included participants undergoing extraction of third molars, most of which were undertaken by oral surgeons. There is some evidence that rinsing with chlorhexidine (0.12% and 0.2%) or placing chlorhexidine gel (0.2%) in the sockets of extracted teeth, provides a benefit in preventing dry socket. There was insufficient evidence to determine the effects of the other 10 preventative interventions each evaluated in single studies. There was insufficient evidence to determine the effects of any of the interventions to treat dry socket. The present review found some evidence for the association of minor adverse reactions with use of 0.12%, 0.2% and 2% chlorhexidine mouthrinses, though most studies were not designed to detect the presence of hypersensitivity reactions to mouthwash as part of the study protocol. No adverse events were reported in relation to the use of 0.2% chlorhexidine gel placed directly into a socket (though previous allergy to chlorhexidine was an exclusion criterion in these trials). In view of recent reports in the UK of two cases of serious adverse events associated with irrigation of dry socket with chlorhexidine mouthrinse, it is recommended that all members of the dental team prescribing chlorhexidine products are aware of the potential for both minor and serious adverse side effects.

## PLAIN LANGUAGE SUMMARY

### What treatments can be used to prevent and treat alveolar osteitis (dry socket)?

Dry socket is a condition that sometimes arises when teeth have been extracted and is more likely to occur following extraction of wisdom teeth in the lower jaw. It is thought to be linked to the loss of some or all of the blood clot that forms at the bottom of a socket after a tooth is taken out, although other factors are probably also involved. Dry socket can be very painful for several days after an extraction and people with this condition can also experience bad breath. The condition can result in more visits to the dentist or dental hospital and other inconveniences such as time lost from work.

This review looked at existing research with the aim of assessing what treatments can be used to prevent and to treat alveolar osteitis (dry socket). The search for existing studies was done on 29 October 2012.

The review team identified 21 trials which met the inclusion criteria for this review: 18 trials (2376 participants) looking at different ways to prevent dry socket and three trials (194) on the treatment of dry socket.

The studies looked at adults over 18 years of age and included (amongst others) people who smoked and took oral contraceptives (both possible risk factors). However, studies involving people who were extremely ill or who had compromised immune systems were not included. Studies which looked at the use of antibiotics to manage dry socket were also not included.

## Prevention

It was found that there is some evidence to show that rinsing both before and after tooth extraction with chlorhexidine gluconate rinse (at 0.12% and 0.2% strength) reduced the risk of having a dry socket. Placing chlorhexidine gel (0.2% strength) in the socket of an extracted tooth also reduced the risk of having dry socket.

The risk of developing dry socket depends on many factors, some of which are unknown. Your dentist or dental care professional (DCP) should be able to advise you of your own risk status.

To illustrate the effectiveness of chlorhexidine treatment as a preventive measure: if the risk of contracting alveolar osteitis (dry socket) was 1% (one in a hundred) then 232 people undergoing tooth extractions would need to be treated to prevent one case of dry socket; if the risk was 5%, then the number needed to be treated to prevent one case of dry socket would be 47; if the risk rises to 30%, the number needed to be treated to prevent one case of dry socket would be 8.

In these trials no serious side effects or reactions by patients due to chlorhexidine were reported. However, two serious events associated with the use of chlorhexidine mouthwash for irrigation of dry socket have been reported in the UK. If people have a history of allergies or have had adverse reactions previously to the use of chlorhexidine mouthwashes they should tell their dentist or DCP before using chlorhexidine. They should also tell their dentist or DCP if they experience any unusual symptoms such as rashes, itching or swelling of the lips whilst using chlorhexidine.

It is recommended that all members of the dental team prescribing chlorhexidine products are aware of the potential for both minor and serious side effects, are competent to manage a medical emergency associated with anaphylaxis (toxic shock) and warn patients of the potential for adverse events.

### **Treatment**

There was insufficient evidence to conclude whether any treatments relieved established dry socket or not.