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Effect of eugenol in the management of alveolar osteitis: A systematic review

James Solomon Jesudasan*, Ashok K. Ramadorai, P.U. Abdul Wahab

Department Oral and Maxillofacial Surgery, Saveetha Dental College, 162 Ponamallee High Road, Velapanchavadi, Chennai 600077, India

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ABSTRACT

Purpose: One of the most common postoperative complications following the extraction of permanent teeth is a condition known as dry socket or alveolar osteitis (AO). The purpose of this review was to answer the question "Does eugenol have any effect in the management of AO?"
Methods: Search: In July 2012 search for relevant trials in The Cochrane Library, MEDLINE and PUBMED (MESH) was done. Selection criteria: Only randomised control trials that used eugenol in management of AO were included in the review. And only human studies of English language were included.
Results: In all the four trials a total of 219 patients out of which 86 patients were administered eugenol for the management of alveolar osteitis. Eugenol was found to be more effective than curettage and irrigation and equal to thermosetting gel and Salicept. Eugenol was found to be less effective than low level laser, GECB and Dextranomer granules. Only RCTs were included and all other articles were excluded from the review.

Contents

☆ AsianAOMS: Asian Association of Oral and Maxillofacial Surgeons; ASOMP: Asian Society of Oral and Maxillofacial Pathology; JSOP: Japanese Society of Oral Pathology; JSOMS: Japanese Society of Oral and Maxillofacial Surgeons; JSOM: Japanese Society of Oral Medicine; JAMI: Japanese Academy of Maxillofacial Implants.

* Corresponding author. Tel.: +91 4426801583; mobile: +91 9940482260.
E-mail addresses: jamesjesudasan@yahoo.co.in, jamesmaxfac@gmail.com (J.S. Jesudasan).

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1. Background

Dry socket was first described as a complication of disintegration of the intra-alveolar blood clot, with an onset 2–4 days after extraction. According to Fazakerlev and Field [1], the alveolus empties, the osseous surroundings are denuded and covered by a yellow-grey necrotic tissue layer, and the surrounding mucosa usually becomes erythematous. It is clinically characterised by a putrid odour and intense pain that radiates to the ear and neck [2]. Pain is considered the most important symptom of dry socket. It can vary in frequency and intensity, and other symptoms, such as headache, insomnia, and dizziness, can be present. Calhoun [3] also reported trismus as a frequent symptom that develops 10–40 days after extraction, if the infection does not spread. Regional lymphadenopathy can be present on the affected side, and fever is infrequent.

Dry socket is commonly observed in patients 40–45 years old [4,5]. Published data have reported an incidence of 1–4% after teeth extraction, with an incidence 10 times greater for lower teeth than for upper teeth [6] and reaching 45% for mandibular third molars [7,8].

Recently, investigators have suggested the following definition for dry socket: postoperative pain surrounding the alveolus that increases in severity for some period from 1 to 3 days after extraction, followed by partial or total clot loss in the interior of the alveolus, with or without halitosis [9,10].

Numerous methods and techniques are proposed throughout the existing literature to assist with prevention of alveolar osteitis (AO). Systemic antibiotics reported to be effective in the prevention of AO include penicillins, clindamycin, erythromycin, and metronidazole [11,12]. A great number of studies have been performed in order to test the effectiveness of topical medicaments in preventing AO. Several studies have reported that the pre- and perioperative use of 0.12% chlorhexidine [13–15] decreases the frequency of AO after mandibular third molar removal. Lagares et al. used chlorhexidine gel on the reduction of the incidence of impacted third molar post-extraction dry socket alveolitis [16]. Early literature reported that the topical use of para-hydroxybenzoic acid (PHBA) [17,18] an antifibrinolytic agent in extraction wounds, decreased the incidence of AO. Some authors have suggested copious intraoperative lavage to reduce the incidence of AO. Butler and Sweet [8,19] reported significant reduction in AO when 175 ml lavage was used as compared to 25 ml lavage. Bloomer et al. suggest that placement of medicated dry socket packing immediately after lower third molar extraction decreases the alveolar osteitis rate [20].

2. Summary of various treatment options

A variety of treatment techniques have been described in the literature [17].

2.1. Non pharmacological methods [21]

- Use of good quality current preoperative radiographs.
- Careful planning of the surgery.
- Use of good surgical principles [22].
- Extractions should be performed with minimum amount of trauma and maximum amount of care.
- Wherever possible preoperative oral hygiene measures to reduce plaque levels to a minimum should be instituted [23].
- Encourage the patient (again) to stop or limit smoking in the immediate postoperative period.
- Advise patient to avoid vigorous mouth rinsing for the first 24 h post extraction and to use gentle toothbrushing in the immediate postoperative period.
- For patients taking oral contraceptives extractions should ideally be performed during days 23 through 28 of the menstrual cycle [19].
- Comprehensive pre- and postoperative verbal instructions should be supplemented with written advice to ensure maximum compliance.

2.2. Pharmacological interventions

- Antibacterial agents.
- Antiseptic agents and lavage.
- Antifibrinolytic agents.
- Steroid anti-inflammatory agents.
- Obtundent dressings.
- Clot support agents.

2.3. Based on the first dictum of medicine

As stated by Hippocrates (421 BC): 'At first do no harm', it seems prudent to limit the pharmacological preventive interventions to measures which are supported by sufficient evidence to be effective, and equally, show a minimum of side effects.

Some authors have promoted the use of eugenol containing dressing to prevent development of AO [20,24–27].

Despite many years of research, little progress has been made in addressing this commonly encountered and unpleasant postoperative condition in patients.

Why it is important to do this review?

Although a variety of treatment methods have been available for alveolar osteitis, there appears to be a paucity of large randomised studies comparing the treatments for alveolar osteitis. There is therefore little research which accurately compares the different interventions with each other and no systematic review has previously been done in this area.

3. Structured question

- Does eugenol have any effect in the management of alveolar osteitis (AO)?

3.1. Pico analysis

- Population—patients with alveolar osteitis or at risk of developing AO.
- Intervention—eugenol.
- Control—various management options of AO.