

DRY SOCKET ETIOPATHOGENESIS, MANAGEMENT and PREVENTION: A BRIEF SYSTEMATIC REVIEW of LITERATURE

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Abstract:

Dry socket is an unavoidable complication of dental extraction facing the dental practitioners on a regular basis. We performed a brief systemic review of the etiopathogenesis, prevention and management of dry socket. The inclusion criteria for including articles were that all the studies discussed the dry socket etiopathogenesis, prevention and management and the exclusion criteria were all the studies that included other complications of tooth extraction. The method used for this systemic review was to search in the PubMed database using MeSH terms “dry socket”, “alveolar osteitis” for etiopathogenesis, prevention and management and published in the English language, 86 articles were identified by abstract for relevance to etiopathogenesis, prevention and management of dry socket and a total of 24 publications were included in the final systematic review according to the specific keywords and materials mentioned above. The audit of the literature showed that the prevention methods include avoiding smoking after surgery, atraumatic extraction, the use of antibiotics and other preventive measures such as use of chlorhexidine rinse or gel to reduce the incidence of dry socket. For management of dry socket, wide range of treatment options are being suggested including using chlorhexidine or saline solution irrigation, placement of non-absorbable obtundent dressing (zinc oxide eugenol dressing) or absorbable dressing (alveogyl dressing) and instruction of home rinsing with chlorhexidine mouthwash. There are also new agents in the field being tried that accelerates the healing of the socket such as PRF and GECB as well as combination of PRF with chlorhexidine gel. This paper is a brief review of the literature on etiopathogenesis, prevention and management of dry socket, in order to best guide clinical practice based on current available evidence.

Keywords: *Alveolar osteitis, Dry socket, Extraction, Fibrinolysis.*

INTRODUCTION

Alveolar osteitis, which is commonly known as dry socket, a complication manifesting itself as severe pain at the site of a tooth extraction. Blum (2002) has described alveolar osteitis as “postoperative pain in and around the extraction site, which increases in severity at any time between one and three days after the extraction, accompanied by a partially or totally disintegrated blood clot within the alveolar socket, with or without halitosis”.¹ In this condition, the bone within the socket is exposed in the days following the extraction, due to disintegration or loss of blood clot leading to lack of a layer of vital, persistent, healing epithelium.^{1,2} The accumulation of food particles stimulating the exposed bone resulting in frequent acute pain. This pain is aggravated on touching the exposed bone with a periodontal

probe. The incidence of dry socket is approximately 0.5% to 5% for all extractions and is up to 38% for mandibular third molar extractions.³

Since AO is a common post extraction complication, extensive literature can be found on alveolar osteitis, including its incidence, etiopathogenesis, prevention and management. even though this condition has been extensively studied, there is currently no clear consensus on prevention or management of dry socket. Difficulties in understanding the aetiology and pathogenesis of this condition has led to a plethora of studies relating to possible prevention and management strategies. In this review we will summarize the current available literature relating to dry socket to elucidate the etiopathogenesis, preventive measures and explore the treatment strategies for AO.

MATERIALS AND METHODS

Literature search was done using the MeSH terms “dry socket”, “alveolar osteitis” for etiopathogenesis, prevention and management on PubMed database for articles relevant to the current review. We included all clinical studies from 2010 to 2020 irrespective of design of the study on alveolar osteitis focusing on the etiopathogenesis, prevention and management of the condition. all the studies that included other complications of tooth extraction were excluded from this review. Out of the 86 literatures obtained, a total of 24 articles were selected based on the relevance for the present systematic review. A meta-analysis could not be performed due to marked heterogeneity and the quality of literature available at the time of the review.

ETIOPATHOGENESIS

It is well known that the etiopathogenesis of dry socket involves localised fibrinolysis occurring within the socket during the post extraction period, subsequently leading to the disintegration of the blood clot leaving an empty extraction socket.⁴ Although bacteria may have a contributing role, no direct correlation has been found between bacteria and dry socket.⁵ Birn (1973) has stated that traumatic extraction leads to a localised inflammation of the socket and release of tissue activators like plasmin in the socket, causing lysis of the blood clot.⁴ A consistent relationship between tobacco smoking and dry socket has been found in literature.⁶ This is thought to be due to the nicotine content of tobacco, which acts as a vasoconstrictor and may reduce blood flow to the extraction socket. Oral contraceptives containing oestrogen has been shown to increase plasma plasminogen levels thereby increasing the fibrinolytic activity which may contribute to dissolution of the blood clot in the socket.⁷ Age of the patient may also play a vital role in pathogenesis of dry socket. The incidence of dry socket is very rare in individuals younger than 20 years, which may be due to the greater bone elasticity, and better healing capacity in young individuals.

PREVENTION AND MANAGEMENT

The role of antibiotics in the prevention and management of dry socket has been discussed in various articles.⁸ Prescription of antibiotics and antiseptic mouthwash after extraction have been used to prevent dry socket. Vessal G et al.⁹, and Bezerra TP et al.¹⁰, recommends use of antibiotics only in extraction with history of dry sockets or for immunocompromised patients. But they did not find any significant difference in dry socket incidence with antibiotic use. Sutures and local haemostatic agents have been used to prevent dry socket by avoiding clot dislodgement. Svensson R, Hallmer F et al.¹¹, showed that the local haemostasis by primary closure, sutures and use of topical tranexamic acid does reduce the risk of postoperative clot dislodgement after extraction especially in patients on continued warfarin therapy. Various studies have been done on the effectiveness of Chlorhexidine in the prevention of dry socket. In order to mitigate the hazards of antibiotic use, research were undertaken to evaluate the

efficacy of different forms of chlorhexidine on prevention of dry socket.¹²⁻¹⁴ Most studies report significant decrease in the incidence of dry socket after the use of chlorhexidine either as a mouth rinse or gel form placed inside the extraction socket. Use of platelet rich fibrin and hyaluronic acid has been studied extensively as a modality to accelerate socket healing and prevent dry socket.^{15,16} Afshin Haraji et al.¹⁷, and US Pal et al.¹⁸, reported that the application of plasma rich fibrin (PRF) may significantly decrease the incidence of dry socket and its associated pain and may accelerate healing of the extraction socket. Even a combination of PRF with 0.2% chlorhexidine gel has showed increased efficacy in lowering dry socket occurrence.¹⁹

Since dry socket is a self-limiting condition, the mainstay of treatment is to provide symptomatic relief from the severe pain experienced by the patient. Eugenol preparation have been used in the treatment of dry socket for quite sometimes. Burgoyne CC et al.²⁰, compared the efficacy of eugenol on a gauze strip and thermosetting gel containing 2.5% prilocaine and 2.5% lidocaine for pain control in alveolar osteitis and reported that the two preparations were equally effective. The use of pastille GECB (Guaiacol, Eugenol, Chlorobutanol, and Balsam peru mixture) has shown some promising results in the treatment of dry socket. Abbas Haghghat et al.²¹, studied the efficacy of pastille GECB (3% Guaiacol, 3% Eugenol, 1.6% Chlorobutanol and Balsam peru mixture), comparing it to eugenol preparation and found that GECB showed greater efficacy in reducing complications after tooth extraction. Low intensity laser therapy has been studied in dry socket management. Kaya G. et al.²², compared alvogyl, Salicept patch and continuous mode diode laser irradiation in the management of dry socket. They found that the use of continuous mode diode laser irradiation had a better result in the management of dry socket. PRF has shown promising results in management of dry socket by providing symptomatic relief within 24 hours due to growth factor and platelet factor release.²³⁻²⁹

DISCUSSION AND CONCLUSION

Dry socket is an unavoidable complication of dental extraction facing the dental practitioners on a regular basis. The possible etiologic factors may include smoking, traumatic extraction, use of oral contraceptives, age of the patient and poor adherence to post extraction instructions by the patient.

The range of treatments for a dry socket including use of chlorhexidine in varying concentrations (0.12- 0.2%) in the form of irrigation into the socket or in the form of gel. Providing symptomatic relief by placement of a resorbing dressing such as Alvogyl® (containing eugenol, butamben and iodoform) or placement of an obtundent dressing containing zinc oxide, eugenol and lidocaine gel. These treatments can be combined with prescription of systemic antibiotics whenever appropriate. While there is no consensus on the definite treatment for dry socket, this article presents a brief description of the condition, its prevention and management as per the literature and current available evidence.

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