

A Study to Evaluate the Efficacy of Honey in the Management of Dry Socket

Abstract

Background: Natural products have been used for several years in folk medicine. Honey was used to treat infected wounds as long ago as 2000 years before bacteria was discovered to be the cause of infection. It has been reported from various clinical studies on the usage of honey as a dressing for infected wounds that the wound become sterile in 3–6 days. **Aim:** This study aimed to find out the efficiency of naturally occurring honey in alveolar osteitis. **Methodology:** Fifty patients of dry socket were selected from the outpatient department of oral and maxillofacial surgery. A diagnosis of dry socket was made clinically. Honey was used as a dry socket dressing in all these patients. Parameters such as mucosal edges, pain, and formation of granulation tissue were assessed in the postoperative period for a week. **Statistical Analysis Used:** Analysis was done by paired *t*-test method using SPSS software version 17. **Results:** In this study, there was a significant reduction in inflammation, hyperemia, and mucosal edges that resulted in the reduction of pain and discomfort to the patient. There was no side effect of honey observed in our study, so it can be used as an alternative for the management of dry socket. Change in distance between mucosal edges when compared from the day of clinical presentation to 5th day postplacement was statistically significant ($P < 0.001$). **Conclusions:** There are no side effects of honey. Excess use of eugenol can lead to necrosis of bone. Thus, honey can be used as a medicament for the management of dry socket.

Keywords: Alveolar osteitis, dry socket, honey

Introduction

Postoperative complications following dental extractions are quite common, of which dry socket is the most common. Dry socket or alveolar osteitis was first described in the literature by Crawford in 1896.^[1] Its incidence ranges from 0.5% to 5%.^[2-4] It is basically a condition in which there is loss of clot from postextraction socket. It usually presents with dull-throbbing pain, halitosis, trismus, and rarely with regional lymphadenopathy.^[5] Various treatment modalities are available such as irrigation of extraction socket with warm saline or dilute hydrogen peroxide and dressing with obtundant medicament; topical application of a combination of eugenol, benzocaine, balsam of Peru, Iodoform, and butylparaminobenzoate; and prophylactic administration of systemic antibiotic beta lactamase inhibitor containing antibiotic, which have claimed to reduce the incidence of dry socket.^[6-8] However, there is

currently no standard treatment. Honey has been in use as a wound dressing for thousands of years and in recent years, it has experienced resurgence. It has shown to accelerate healing and prevent infections. It has been reported from various clinical studies on the usage of honey as a dressing for infected wounds that the wound become sterile in 3–6 days. It has also been reported that honey dressing halts the advancing necrosis. Hence, honey can be used for the management of dry socket. In Ayurveda, honey is considered to positively affect all the three primitive imbalances of the body. Charaka and Sushruta applied honey dressing for sores. In the 3rd century, Greek philosopher Celsus used mixes honey and bran to treat burn.^[9] The antibacterial activity of honey is due to its osmolarity and acidity and also due to glucose oxidase, an enzyme that bees add to the collected nectar stored in honeycombs.

In this study, we evaluated the usage of honey (trade name: Dabur Honey, Dabur India Ltd) in the treatment of dry sockets following complication encountered after nonsurgical extractions.

How to cite this article: Ansari A, Joshi S, Garad A, Mhatre B, Bagade S, Jain R. A study to evaluate the efficacy of honey in the management of dry socket. *Contemp Clin Dent* 2019;10:52-5.

**Arsalan Ansari,
Sanjay Joshi,
Aarti Garad,
Bhupendra Mhatre,
Saching Bagade,
Rushika Jain**

*Department of Oral and
Maxillofacial Surgery, Ternal
Dental College, Nerul,
Navi Mumbai, Maharashtra,
India*

Address for correspondence:
Dr. Arsalan Ansari,
Baugh E Usman Heights,
13th Floor, Flat No. 1306, Badlu
Rangari Street, Sankli Street,
Nerul, Mumbai - 400 008,
Maharashtra, India.
E-mail: drarsalanofms@gmail.
com

Access this article online

Website:
www.contempclindent.org

DOI: 10.4103/ccd.ccd_283_18

Quick Response Code:



This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: reprints@medknow.com



Figure 1: Preoperative

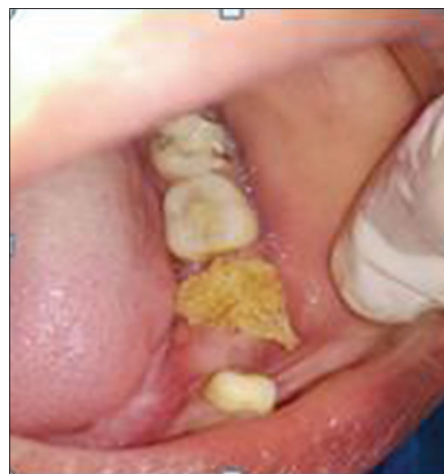


Figure 2: Honey dressing placed



Figure 3: Postoperative 3rd day



Figure 4: Postoperative 5th day

Methodology

This is a prospective study and was conducted at the Department of Oral and Maxillofacial Surgery, Terna Dental College and hospital, Navi Mumbai, India, for a 1-year period. Fifty patients with dry socket were recruited for the study. The diagnostic criteria for dry socket were based on the history of extraction of 2 or more days and pain, clinical examination for sensitivity on gently probing of the extraction socket, trismus, halitosis, and the condition of tooth socket, i.e., bare bone and loss of blood clot.

Inclusion criteria

- Patients willing to participate in the study
- Patients with dry socket postextraction.

Exclusion criteria

Patients with systemic diseases such as diabetes mellitus, hepatic dysfunctions, blood dyscrasias, and bleeding disorders were excluded from the study.

Informed consent of the patients was taken after explaining the risks and benefits associated with the treatment.

Patients were divided in two groups, namely study group and control group with 25 patients in each group.

In the study group, after flushing the socket with normal saline and betadine solution, 2 ml of honey soaked in sterile gauze was applied to cover the socket, whereas in the control group, a gauze with zinc oxide eugenol paste was used to cover the socket instead of honey.

Patients were recalled for follow-up on postoperative 3rd day, 5th day, and 10th day. Dressing was changed at every visit.

The following were the parameters assessed on follow-up visit clinically, i.e., pain, swelling, redness, and formation of granulation tissue in the socket.

Pain was measured by the Visual Analog Scale (VAS). According to this scale, patient's pain was categorized as mild (1–4), moderate (5–7), and severe (8–10). Sensitivity on gentle probing of the extraction socket was considered on all or none basis.



Figure 5: Postoperative 10th day

All the patients were called for follow-up on 3rd, 5th, and 10th days for pain assessment, evaluating mucosal edges, and assessing the periodontal index.

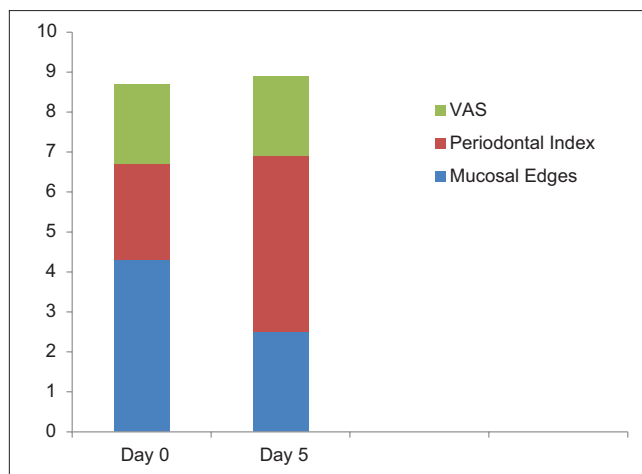
Statistical analysis was done by paired *t*-test method using SPSS software version 17 (Dabur India Ltd, 8/3 Asaf Ali road, New Delhi 110002, India).

Results

Healthy granulation tissue formation in honey group was noted from the 5th day. The formation of granulation tissue and resultant healing of socket were enhanced in patients where honey was used as a medicament for the treatment of dry socket. Change in the distance between mucosal edges when compared from the day of clinical presentation to 5th day postplacement was statistically significant ($P < 0.001$). Other parameters such as VAS scale and periodontal index were also found to be better when compared with 0 day to 5th day but were not statistically significant ($P = 0.547$ and $P = 0.370$, respectively) [Table 1 and Graph 1]. Hence, we found that there was a significant reduction in inflammation, hyperemia, and mucosal edges that resulted in the reduction of pain and discomfort to the patient [Figures 1 to 5]. There was no side effect of honey observed in our study, so it can be used as an alternative for the management of dry socket.

Discussion

Dry socket is believed to occur due to high level of fibrinolytic activity in the extraction socket resulting in the lysis of blood clot, which results in the exposure of bone. The pain of dry socket occurs because of the release of kinins which are immediately available following tissue trauma; exposure of nerve endings to air, food, and fluids in bare bone of the extraction socket; and an infectious process which releases tissue activators and pain mediators. Dry socket is more common in mandible than maxilla because of more vascularization of maxilla than mandible. In addition, molars are more



Graph 1: Change in parameter (Mucosal edges, VAS scale & periodontal index) on 0 day and 5th day

Table 1: Describes significant changes in distance between mucosal edges, VAS scale and periodontal index on 0 day and 5th day

Parameters	0 days (mean±SD)	5 days	P
Mucosal edges	4.5000±2.08248	2.4600±1.52810	0.000
Periodontal index	2.0400±0.53299	2.8200±0.71969	0.547
VAS scale	1.3200±47121	2.6000±0.53452	0.370

VAS: Visual Analog Scale; SD: Standard deviation

involved because their sockets have wider circumferences resulting in larger blood clots than other teeth, which probably expose the blood clots to more fibrinolytic activity.

The traditional method of management is aimed at pain control until the beginning of normal healing. Systemic antibiotics are not needed for treating dry socket. It is a superficial inflammation merely of cortical plate of the extraction socket, and hence topical anesthetic or analgesic gels are enough for treatment.^[10]

Among many therapeutic agents, honey is a carbohydrate-rich syrup produced by bees from floral nectar. Honey is a nectar collected by bees from a wide variety of plants, which is concentrated by evaporation of water to form a saturated or supersaturated solution of sugars, consisting typically of 17% water, 38% fructose, 31% glucose, 10% other sugars, and a wide range of micronutrients (vitamins, amino acids, and minerals), with a pH below 4.^[11]

It is antibacterial, anti-inflammatory, and odorless. It helps in granulation and epithelialization, shedding of necrotic tissue, and has analgesic and antioxidant effects.^[12] Honey helps to keep the wound moist. In addition, it stimulates white blood cells to produce cytokines, particularly interleukin-1, interleukin-6, and tumor necrosis factor. Honey also helps to speed up the healing process and reduces scarring.^[13] Honey dehydrates bacteria due to its hygroscopic property, rendering them

inactive. The potassium withdraws moisture from the bacteria. Aluminum sulfate and sucrose present in honey also accelerate normal healing process.^[14] In their study, Elbagoury and Fayed used honey as a dressing material after surgical removal of impacted third molars which resulted in less pain.^[15]

Hygroscopic properties, acidic pH, and hydrogen peroxide present in honey make it antibacterial which was recognized by Molan.^[10]

Hydrogen peroxide produces enzyme which is a major factor giving honey its antibacterial property. Peripheral B-lymphocytes and T-lymphocytes proliferate, which stimulates monocytes to release tumor necrosis factor,^[10] and also hydrogen peroxide produces sterilizing effect when ripened.^[16]

Bacteria get destroyed due to glucose content which is essential for the “respiratory burst” in macrophages. Additionally, honey substrates for glycolysis, the major mechanism of energy production in macrophages.

Honey also has antioxidant property due to its inhibition of chemiluminescence in a xanthine/xanthine oxidase-luminal system that works via generation of superoxide radicals.^[17,18]

The overall physical properties of honey provide a protective barrier by osmosis, which creates moist healing environment and does not stick to the underlying tissue.

Conclusions

Honey soaked in sterile gauze placed in dry socket cases showed accelerated healing with minimum patient discomfort. Excess use of eugenol can lead to necrosis of bone. Honey can be used as a medicament for the management of dry socket.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

- Gottlieb B, Crawford H. Therapy and prophylaxis of dry socket. *Am J Orthod Oral Surg* 1943;29:B328-31.
- Blum IR. Contemporary views on dry socket (alveolar osteitis): A clinical appraisal of standardization, aetiopathogenesis and management: A critical review. *Int J Oral Maxillofac Surg* 2002;31:309-17.
- Report of a workshop on the management of patients with third molar teeth. *J Oral Maxillofac Surg* 1994;52:1102-12.
- Al-Khateeb TL, el-Marsafi AI, Butler NP. The relationship between the indications for the surgical removal of impacted third molars and the incidence of alveolar osteitis. *J Oral Maxillofac Surg* 1991;49:141-5.
- Neville BW, Damm DD, Allen CM, Bouquet JE. *Oral & Maxillofacial Pathology*. Philadelphia: W.B. Saunders; 2002.
- Nitzan DW. On the genesis of “dry socket”. *J Oral Maxillofac Surg* 1983;41:706-10.
- Peterson L. *Contemporary Oral and Maxillofacial Surgery*. St. Louis: Mosby; 2003.
- Cawson R, Odell E, Porter S, Cawson R. *Cawson’s Essentials of Oral Pathology and Oral Medicine*. Edinburgh: Churchill Livingstone; 2002.
- Singh V, Pal US, Singh R, Soni N. Honey a sweet approach to alveolar osteitis: A study. *Natl J Maxillofac Surg* 2014;5:31-4.
- Molan P. The antibacterial activity of honey. *Bee World* 1992;73:5-28.
- White J. The composition of honey. *Bee World* 1957;38:57-66.
- Allen K, Molan P. The sensitivity of mastitis-causing bacteria to the antibacterial activity of honey. *N Z J Agric Res* 1997;40:537-40.
- MunFei Y, Pillay A, Zainol J. Experimental evaluation of repair process of burn-wounds treated with 15 UMF Manuka honey. *J Med Sci (Faisalabad)* 2003;3:358-66.
- Ikram R, Khan SA, Cheema MS. Treatment of dry socket. *Prof Med J* 1998;5:451-5.
- Elbagoury EF, Fayed NA. Application of “natural honey” after surgical removal of impacted lower third molar. *Egypt Dent J* 1985;31:203-11.
- Namias N. Honey in the management of infections. *Surg Infect (Larchmt)* 2003;4:219-26.
- Frankel S, Robinson G, Berenbaum M. Antioxidant capacity and correlated characteristics of 14 unifloral honeys. *J Apic Res* 1998;37:27-31.
- Mobarok Ali AT, al-Swayeh OA. Natural honey prevents ethanol-induced increased vascular permeability changes in the rat stomach. *J Ethnopharmacol* 1997;55:231-8.