

## Original Article

## Role of turmeric in management of alveolar osteitis (dry socket): A randomised clinical study

Parveen Akhter Lone<sup>a,\*</sup>, Syed wakeel Ahmed<sup>b</sup>, Vivek Prasad<sup>b</sup>, Bashir Ahmed<sup>c</sup><sup>a</sup> Professor & Head, Maxillofacial & oral surgery (OMFS), Indira Gandhi government dental college jammu, 180005 affiliated to university of jammu, Jammu & Kashmir, India<sup>b</sup> Department of OMFS IGGDC jammu, India<sup>c</sup> Department of geology, University of jammu, Jammu & Kashmir, India

## ARTICLE INFO

## Article history:

Received 29 June 2017

Accepted 29 August 2017

Available online 1 September 2017

## Keywords:

Mustard oil

dry socket

Curcumin

Holy powder

Anti-inflammatory

## ABSTRACT

Plants & their extracts have immense potential for the management or treatment of the wounds. The phyto medicines for the wound healing are not only cheap & affordable but are purportedly safe as hypersensitivity reactions are rarely encountered with the use of these agents, these natural agents induce healing & regeneration of the lost tissue by multiple mechanisms Turmeric commonly is called as Haldi in Hindi. *C. Longa* has been reported to possess anti bacterial, anti fungal & anti inflammatory activities. Turmeric is known as traditional herb to Asia & India also called as *curcuma longa*, with maximum healing properties & other great uses. It is widely used in India & China for traditional Chinese medicine. This act as anti inflammatory agent to treat different kind of diseases & health problems.

**Aims & objectives:** The aim of this study was to study the therapeutic, healing benefits of turmeric, an herb commonly used in Asia

**Material & methods:** The study was conducted in department of oral & maxillofacial surgery of Indira Gandhi government dental college jammu. 178 patients were selected from the outpatient department of oral & maxillofacial surgery. The diagnosis of dry socket was made clinically. Turmeric dressing with mustard oil was given in group A & in group B ZOE dressing was given.

**Results:** In this study there was significant reduction in pain, inflammation & discomfort after turmeric and ZOE dressing. Wound healing was seen faster, than dressing with ZOE. There is no side effect of Turmeric. Statistical analysis was done  $p < 0.05$ , was found statistically significant

© 2018 Published by Elsevier B.V. on behalf of Craniofacial Research Foundation.

## 1. Introduction

Wound is defined as the disruption of the cellular & anatomic continuity of a tissue of a tissue<sup>1</sup> or as a break in integrity of skin or mucosa & may also be defined as a loss or breaking of cellular & anatomic of functional continuity of living tissue.<sup>2</sup> Wound may be produced by physical, chemical, thermal, microbial or immunological insult to the tissues & damage to the skin or mucosa is a good medium for entry & growth of micro organism.

Alveolar osteitis also called dry socket is the most common post extraction complication of teeth, most commonly occurring in 40–45 years of age. Traumatic extraction, aggressive curettage & irrigation, oral microorganisms, remaining fragments of bone &

root in extraction wound, dislodgement of blood clot by excessive mouth rinsing & gargles by patient, oral contraceptives & smoking are important etiologic factors responsible for dry socket. There is loss of blood clot from socket. Symptom ranges from mild discomfort to sever pain, radiating to temporal region, TMJ, ear & eye, halitosis, empty socket & Trismus.

There are various modalities used for management of dry socket like use obtund ant & pain reducing dressing such as zinc oxide euginol dressing, anti infective agents, systemic or local, anti fibrinolytic agent & surgical intervention to remove necrotic clot & encourage the formation of blood clot. Treatment include administration of drugs either locally or systemically in attempt to initiate wound repair.<sup>3</sup> The topical agents include antibiotic & antiseptic,<sup>4</sup> dislodging agent (chemical debridement eg hydrogen peroxide, eusol & collagenase ointment).<sup>5</sup> Wound healing promoters eg tretinoin, aloe Vera extract honey comfrey, benzoyl peroxide, dexpanthol, tetrachloride oxide solution, clostebol acetate & chamomillia

\* Corresponding author.

E-mail addresses: [parveen.lone@yahoo.com](mailto:parveen.lone@yahoo.com) (P.A. Lone), [syedwakeel12@gmail.com](mailto:syedwakeel12@gmail.com) (S.w. Ahmed), [Drprasadvivek1991@gmail.com](mailto:Drprasadvivek1991@gmail.com) (V. Prasad), [basher@jugga.com](mailto:basher@jugga.com) (B. Ahmed).

Various substances like tissue extracts,<sup>6</sup> vitamins & minerals & No of plant products<sup>7</sup> have been reported by various workers to possess pro healing effects. Wound healing herbals accelerates blood clotting, fight infection & accelerates the wound healing also. Plants or chemicals derived from plants need to be identified & formulated for treatment & management of wounds. No of herbal products are being investigated at present & various herbal products have been used in management of wounds over the years, few of them are Aloe Vera, Neem, cedrus, turmeric, jasmine auriculatum.

Turmeric is an amazing natural herbal with healing properties. It has been used as traditional remedy in ayurvedic medicine for thousands of years. it has powerful anti oxidant & anti inflammatory properties.<sup>8-10</sup> Turmeric has many valuable components but the one seems getting attention is curcumin.<sup>11</sup> Curcumin is a yellow pigment present in the spice turmeric (curcuma Longa) & has been linked with anti oxidant, anti inflammatory, antiprolifeartive, anti diabetic, anticancer, anti viral, & anti Rheumatic effects.

In India & Asia this native traditional herb is called holy powder because of its anti inflammatory properties to treat different kinds of diseases & health problems, digestive difficulties, treatment of infections & wounds. It is only soluble in fat, so curcumin is best to combine with fats, coconut milk, ghee, butter, oils etc.<sup>11</sup> In the present study turmeric powder was mixed with mustard oil to make paste.

## 2. Methodology

A total of 178 patients of dry socket were selected from outpatient department of Oral & Maxillofacial surgery. Patients with systemic ailments like diabetes, patients on steroid therapy, hypothyroid patients, pregnant & lactating mothers were not included in the study. The informed consent was taken from the patient. Diagnosis of dry socket was made clinically. Wound was checked for necrotic bone, fetid odour, pain swelling, and pus discharge. Patients were divided in two groups

GROUP A was treated with a dressing of turmeric & mustard oil.

GROUP B was treated with zinc oxide euginol dressing.

Dried Rhizome of C longa (Haldi) collected from local market was crushed into powder using a mechanical blender. The fine powder was obtained after sieving using 150 Mm sieve. This powder was stored & fresh dressing using sterile gauge & mustard oil was prepared. This dressing was done on alternate days till symptoms subsided. After irrigation with saline socket was packed with dressing. (Figs. 1–3) This study was under taken to evaluate the effect of turmeric dressing in management of dry socket wound

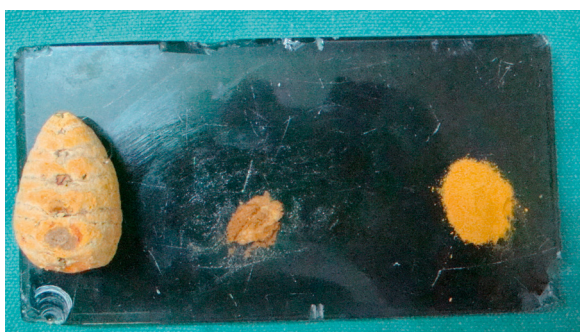


Fig. 1. Dry socket wound.

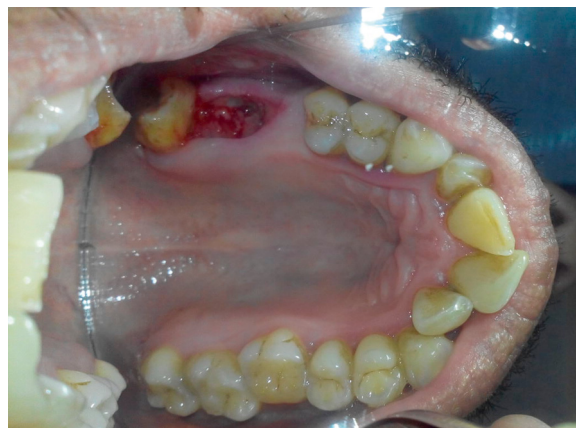


Fig 2. Dressing prepared.



Fig. 3. Dressing in socket.

**Table 1**  
Number of patients revealed subsided symptoms in different days of dressing.

Group	Day of dressing						Total
	2nd	3rd	4th	5th	6th	7th	
Group A	55	25	10	0	0	0	90
group B	0	0	40	37	0	11	88
Total	55	25	50	37	0	11	178

### 3. Results

In group A all the symptoms like pain, swelling, necrotic socket, halitosis, started subsiding from 2nd day as shown in Table 1 & bar graph. Whereas in group B in majority of the patients symptoms started subsiding on 4th dressing onwards

Test of significance between two treatment groups (Chi-square test/goodness of fit test)

**H<sub>0</sub> (Null hypothesis).** Two treatment groups are independent i.e. No difference between two treatments is seen

**H<sub>1</sub> (Alternate hypothesis).** Two treatment groups are not independent i.e. significant difference between two treatments is noted

Note: 6th day figure not considered for calculation as none of the cases was reported. After ( $\chi^2$  test)  $p < 0.05$ , reject H<sub>0</sub>, statistically significant. (Table 2)

### 4. Discussion

Dry socket alveolar osteitis is a very common complication after extraction or surgical removal of tooth. Commonly known as “dry socket” this condition remains a common postoperative problem that results in severe pain and repeated practice/hospital visits.<sup>12</sup> Most studies have shown that the incidence of dry socket is 1–4% of all routine dental extractions. & 5–30% of impacted third molar.<sup>13–14</sup> In the present study dry socket was seen in 7% extractions & 4% after impactions

Onset of Alveolar osteitis (AO) is 1–3 days after tooth extraction & duration usually ranges from 5 to 10 days. Similarly in the present study Patients with the symptoms reported as follows 58 on 5th day, 24 on 4th day 22 on 6th day 13 on 7th 3 on 9th day.<sup>15</sup>

During last century many attempts have been made to find proper way of preventing & management of dry socket & large no of clinical studies have been carried out in these subjects. Medical treatment of wound include administration of drugs either locally or systemically in an attempt to aid wound repair.<sup>16</sup> Various herbal products have been used in wound management like, Aloe Vera, Neem, & turmeric. Turmeric, curcuma longa, cedrus deodar, jasminum auriculatum. Honey has been used in management alveolar osteitis.<sup>16</sup>

C.longa commonly known as turmeric & Haldi in Hindi has been reported to possess antibacterial, anti-fungal activities.<sup>17</sup> Turmeric extract rich in curcuminoids a widely known for its anti inflammatory, anti oxidant & anti microbial properties. The mechanism of action of Curcumin may be considered as multi-centric since it act as a prostaglandin inhibitor, stabilizer of the liposomal membrane, inhibitor of the activity of leucotrienes &

thromboxaneB4 without effecting the synthesis of prostacyclines, stimulator of adrenal steroidogenesis, substance P Depletor in nerve terminals, analgesic & anti oxidant.<sup>18,19</sup>

Curcuma longa also contains proteins, fats, (A,B,C) all have important role in wound healing & regeneration.<sup>20</sup> The anti-inflammatory property & presence of vit A & protein result in early synthesis of collagen fibers by mimicking fibroblastic activity. Juice of fresh rhizome is commonly applied to recent wounds, bruises & leech bites.<sup>21</sup>

The anti-inflammatory properties of curcumin were shown to inhibit the 5-lipoxygenase activity in rat peritoneal neutrophils as well as the 12-lipoxygenase and the cyclooxygenase activities in human platelets.<sup>22</sup> Curcumin had no significant effect on quercetin-induced nuclear DNA damage, lipid per oxidation and protein degradation and thus has the unique potential of acting as both pro- and antioxidants, depending on the redox state of their biological environment. Extensive in vitro and in vivo testing has shown that turmeric inhibits chemically-induced epidermal ornithine decarboxylase activity, epidermal DNA synthesis, and the promotion of skin tumours in mice.<sup>23</sup>

Turmeric also reduce arachidonic acid induced rat paw & mouse skin oedema & markedly inhibit epidermal lipoxygenase & cyclooxygenase activity in vitro as reported in few studies.<sup>24</sup>

Ingestion of turmeric has demonstrated a bacteriostatic or bactericidal effect against organism involved in cholecystitis & has been used to treat biliary infection in humans. Topical application of turmeric paste has shown good results in scabies.<sup>25</sup>

It has been demonstrated that turmeric helps in treatment of chronic ulcers through the following mechanism 1) microcirculation improvement 2) angiogenesis stimulation 3) granulation tissue formation promotion, 4) re epithelialization acceleration. All of the wounds in their study exhibited the typical pattern of wound healing, with minimal wound contraction noted during the initial lag phase followed by a rapid increase in wound contraction during the proliferative phase day 6 to day 25. It has been reported that with topical or oral use of turmeric the size of wound reduced significantly during proliferative phase when compared to wound size treated with saline. This shows that oral intake or topical application of turmeric may enhance wound healing & contraction of wound when compared with daily cleansing with saline & ZOE dressing. Turmeric powder was tested for its healing abilities in acute wounds created by surgical incisions before entering the clinical trials.<sup>26</sup>

### 5. Conclusion

The present study was done to use turmeric to promote wound healing. We found that the use of turmeric at the site of an injury by topical application promotes healing of wounds. The results of present study clearly indicated that the turmeric Accelerated wound healing process. & has great potential for wound healing. Therefore the turmeric can be used in different forms for treating different ailments including surgical wounds.

**Table 2**  
Test calculation ( $\chi^2$  tests).

Group	2nd Day	3rd Day	4th Day	5th Day	7th Day	Total
Observed Frequency						
Group A	55	25	10	0	0	90
group B	0	0	40	37	11	88
Total	55	25	50	37	11	178
Expected frequency						
Group A	27.81	12.64	25.28	18.71	5.56	90
group B	27.19	12.36	24.72	18.29	5.44	88
Total	55	25	50	37	11	178
df	4					
p	1.47E-30					
$\alpha$	0.05					

### References

- Bennet RG. *Fundamentals of Cutaneous Surgery*. St. Louis: C.V.Mosby; 1988 [778].
- Rizvi SC, Vinay K, Stainly R. *Pathologic Basis of the Disease WB Saunders Company Philade Curcuma Longa Linn.*
- Savanth SS, Shah RA. In: Savant SS, Shah RA, Gore D, eds. *Text Book and Atlas of Dermatology and Cosmetology*. 1st edn Mumbai: ASCAD; 1998:12–17.
- Chulani HL. *The Law of Medical Negligence*. 1st edn Mumbai: Radhakrishnan Medical and Educational Trust; 1996:51–83.
- Savanth SS, Mehta N. In: Savanth SS, Shah RA, Gore D, eds. *Text Book & Atlas of Dermatosurgery & Cosmetology*. 1st edition Mumbai: ASCAD; 1996:50–61.
- Rao SG, Udupa AL, Udupa SL, Rao PGM, Rao Ganesh, Kulkarni DR. *Calendula and Hypericum: two homeopathic drugs promoting wound healing in rat. Fitoterapia*. 1991; LXII(6):508–510.

7. Dahanukar SA, Kulkarni RA, Rege NN. Pharmacology of medicinal plants and natural products. *Indian J Pharmacol.* 2000;32:S81–S118.
8. Menon VP, Sudheer AR. Antioxidant & anti inflammatory properties of curcumin. *Adv Exp Med Biol.* 2007;595:105–125 [Article].
9. Jagetia G, Aggarwal CBB. Spicing up of the immune system by curcumin. *J Clin Immunol.* 2007;27(1):19–35.
10. White B. D. Z. clinical inquiry, does turmeric relieve inflammatory condition? *J Fam pract.* 2011;60(3):155–156 [11 Pari].
11. Tewas D, Eckel J. Role of curcumin in health & diseases. *Arch physiol Biochem.* 2008;114(2):127–149.
12. Rood JP, Danford M. Metronidazole in the treatment of Dry Socket. *Int J Oral Surg.* 1981;10:345–347.
13. Rud J. Removal of impacted lower third molar with acute pericoronitis and acute necrotizing gingivitis. *Br J Oral Surg.* 1970;7:153–159.
14. Blum IR. Contemporary views of dry socket (AO): a clinical appraisal of standardization, aetiopathogenesis and management: a clinical review. *Int J Oral Maxillofac Surg.* 2002;31:309–317.
15. Trieger N, Schlagel GD. Preventing dry socket: a simple procedure that works. *J Am Dent Assoc.* 1991;122:67–68.
16. Sanchis JM, Penarrocha M. Tetracycline compound placement to prevent dry socket: a postoperative study of 200 impacted mandibular third molars. *J Oral Maxillofac Surg.* 2004;62:587–591.
17. Schmidt JM, Greenspoon JS. *Aloe vera* dermal wound gel is associated with a delay in wound healing. *Obstet Gynecol.* 1991;78:115–117.
18. Chopra RN, Nayar SL, Chopra IC. *Glossary of Indian Medicinal Plants*, 1 New Delhi: CSIR; 1986.
19. Jorge Alonso. *Tratado De Fitofármacos Y Nutraceuticos*, 1 Barcelona: Corpus; 2004:395–403 [633.8 ALO].
20. Srimal RC. Turmeric: a brief review of medicinal properties. *Fitoterapia.* 1997;68(6):83–94 [ref.2503].
21. Rao SGV, Selvaraj J, Senthil R, Radhakrishnan RN, Murali Manokar B. Efficacy of some indigenous medicines in wound healing in rats. *Indian J Anim Sci.* 2003;73:652–653.
22. Kumar AS, Singh HP, Parkash Prem, Singh SP. Efficacy of some indigenous drugs in tissue repair in buffaloes. *Indian Vet J.* 1993;70:42–44.
23. Ammon HPT, et al. Mechanism of antiinflammatory actions of curcumin and boswellic acids. *J Ethnopharmacol.* 1993;38:113–119.
24. Huang MT, et al. Inhibitory effect of curcumin, chlorogenic acid, caffeic acid, and ferulic acid on tumor promotion in mouse skin by 12-O-tetradecanoylphorbol-13-acetate. *Cancer Res.* 1988;48:5941–5946.
25. Conney AH, et al. Inhibitory effect of curcumin and some related dietary compounds on tumor promotion and arachidonic acid metabolism in mouse skin. *Adv Enzyme Regul.* 1991;31:385–396.
26. Ramprasad C, et al. Observation on the Pharmacology of *Curcuma Longa*, Linn. *Ind. J. Phys. and Pharm. A.* 1957;1:136–143.