Original Article - Comparative Study

Efficacy of Alvogyl (Combination of Iodoform + Butylparaminobenzoate) and Zinc Oxide Eugenol for Dry Socket

Narendra B. Supe, Sneha H. Choudhary[1], Sheetal M. Yamyar[2], Kuldeep S. Patil[3], Amit Kumar Choudhary[4], Vishwas D. Kadam[5]

Departments of Oral and Maxillofacial Surgery, [2]Orthodontics and [5]Oral Medicine and Radiology, C.S.M.S.S. Dental College and Hospital, Aurangabad, Maharashtra, [1]Department of Oral Medicine and Radiology, Teerthanker Mahaveer Dental College and Research Centre, [4]Department of Anaesthesia, Teerthanker Mahaveer Medical College, Moradabad, Uttar Pradesh, [3]Department of Periodontics, Dr. HSRSM Dental College and Hospital, Hingoli, Maharashtra, India

Abstract

Context: Alveolar osteitis (AO) (dry socket) is a postoperative healing complication after tooth extraction. Pain is considered the most important symptom of dry socket which can vary in frequency and intensity. **Aim:** The aim of the present study was to evaluate the management of AO with alvogyl and zinc oxide eugenol (ZOE). **Study Design:** This study was designed as a single-blinded prospective study with a sample size of fifty patients included in the study after obtaining the informed consent. **Materials and Methods:** All the fifty patients with dry socket were randomly selected and divided into two groups as follows: (1) Group I: Patients who received alvogyl paste as an intrasocket medication and (2) Group II: Patients who received ZOE as an obtundant dressing. **Statistical Analysis Used:** Data were analyzed using *t*-test and Chi-square test. **Results:** The mean number of dressings required was less in Group I as compared to Group II, and thus Group I showed faster healing. In addition, the intensity of pain decreased more rapidly in Group I as compared to Group II. The mean time required for complete pain relief was less in Group I as compared to Group II, and thus Group I showed faster relief from pain. **Conclusion:** Alvogyl is better for the management of dry socket by virtue of shorter time required for complete pain relief, fewer visits for dressing change, and faster clinical healing of the socket.

Keywords: Alveolar osteitis, alvogyl, dry socket, zinc oxide eugenol

Introduction

Alveolar osteitis (AO) is defined as "postoperative pain inside and around the extraction site, which increases in severity at any time between the first and third days after the extraction, accompanied by a partial or total disintegrated blood clot within the alveolar socket with or without halitosis."[1] The term "dry socket" was first used by Crawford in 1896 to describe the condition. Other terms such as fibrinolytic alveolitis, alveolitis sicca dolorosa, postoperative alveolitis, alveolalgia, septic socket, necrotic socket, localized osteomyelitis, and delayed extraction wound healing have also been used in reference to this condition.[2] It is clinically characterized by the denuded osseous surroundings covered by a yellow-gray necrotic tissue layer, with the surrounding mucosa usually becomes erythematous, with putrid odor and intense pain that radiates to the ear and neck. Treatment of AO can be either pharmacological or nonpharmacological.[3] Management of dry socket can be by irrigation, surgical intervention, and placement of medicated dressing such as antibacterials, topical anesthetics, and obtundants, or combinations of all the three, for example, zinc oxide and eugenol-impregnated cotton pellets, alvogyl, and dentalone.[4] Till date, only one study has been reported in literature that had compared the effectiveness of alvogyl, zinc oxide eugenol (ZOE) and neocone in the management of dry socket. However, there is no study to show whether alvogyl is better than ZOE for the treatment of AO in detail. Therefore, the

Access this article online

Quick Response Code:

Website: www.amsjournal.com

DOI: 10.4103/ams.ams_167_18

Address for correspondence: Dr. Sneha H. Choudhary, Department of Oral Medicine and Radiology, Teerthanker Mahaveer Dental College and Research Centre, Moradabad, Uttar Pradesh, India. E-mail: snehachy1606@gmail.com

How to cite this article: Supe NB, Choudhary SH, Yamyar SM, Patil KS, Choudhary AK, Kadam VD. Efficacy of alvogyl (Combination of Iodoform + Butylparaminobenzoate) and zinc oxide eugenol for dry socket. Ann Maxillofac Surg 2018;8:193-9.

present study was undertaken to compare the healing capacity of alvogyl and ZOE.

Aim

This study aimed to evaluate the efficacy of alvogyl in comparison with ZOE in the treatment of dry socket.

Objectives

- To compare the efficacy of alvogyl versus ZOE in relieving pain
- To compare the time duration taken to heal dry socket after the application of alvogyl versus ZOE
- To compare the mean time required for complete pain relief after the application of alvogyl versus ZOE.

Study design

This study, which was designed as a single-blinded prospective study, was conducted on fifty patients reporting to the department of oral and maxillofacial surgery who required treatment for dry socket after extraction from September 2013 to June 2015.

The protocol of the study was approved by the Institutional Ethical Committee.

The following inclusion and exclusion criteria were considered and only those patients who met the inclusion criteria were selected for the study after taking an informed consent.

Inclusion criteria

1. Patient age group ranging between 14 and 70 years
2. Both males and females.

Exclusion criteria

1. Patients who are allergic to alvogyl and/or to other medications prescribed in the study
2. Patients below the age of 14 years and above the age of 70 years
3. Pregnant patients
4. Medically compromised patients, for example, diabetes in which healing is delayed
5. Patients having fractured root or foreign body in the dry socket.

Materials And Methods

All the fifty patients with dry socket were randomly allocated into two groups as follows:

- Group I: Patients who received alvogyl (combination of iodoform + butylparaminobenzoate) paste as an intrasocket medication
- Group II: Patients who received ZOE as an obtundant dressing.

Details of materials

Group I

Alvogyl is a brown fibrous paste available in jars of 12 g. It contains the following ingredients per 100 g (Septodont):

Active ingredients:

- 25.70 g of Butamben (butylparaminobenzoate)
- 15.80 g of iodoform (triiodomethane) and
- 13.70 g of eugenol.

Other ingredients:

Olive oil, spearmint oil, sodium lauryl sulfate, calcium carbonate, penghawar djambi, fibers derived from the brackenfern, cibatium barometz, and purified water.

Group II

ZOE cement prepared by mixing powder and liquid.

Powder:

- Zinc oxide – 80.0%
- Polymethyl methacrylate – 20.0%
- Zinc stearate – traces
- Zinc acetate – traces
- Thymol – traces.

Liquid:

- Eugenol – 85.0%
- Olive oil – 15.0%.

Procedure

All the patients presenting with dry socket were evaluated by taking intraoral periapical radiographs to exclude the presence of root fragments within a socket. All the patients in the study routinely received tablet diclomol 50 mg as rescue medication. Before giving the dressing, all the patients were carefully evaluated for pain, amount of bone exposed, and healing. The socket was irrigated with betadine and sterile saline to make free of food debris in both treatment groups. Curettage was avoided in order to prevent dislodging of any residual clot present in the socket.

Patients were recalled on the 3rd, 5th, 7th, and 10th days, and pain, healing, and complications (if any) were evaluated and recorded in each visit according to the following criteria.

1. Pain was evaluated by Visual Analog Scale (VAS) as follows:
    - No pain (score 0): No need for analgesic
    - Mild pain (scores 1–3): One tablet of 50 mg diclofenac sodium per day
    - Moderate pain (scores 4–6): Two tablets of 50 mg diclofenac sodium per day
    - Severe pain (scores 7–10): More than two tablets of 50 mg diclofenac sodium per day.

Furthermore, the time required for the complete pain relief was recorded.

2. Healing

Healing was measured by socket covered by initial granulation tissue on a scale as follows:

- 0 – No healing
- 1 – 1/4th of the socket covered
- 2 – 1/2nd of the socket covered
- 3 – 2/3rd of the socket covered
- 4 – 3/4th of the socket covered

- 5 – The socket covered almost completely, wound closed.

Time required for the healing of the socket almost completely was noted.

The number of dressings required for healing of the extraction socket was evaluated clinically as per the below-mentioned criteria.

- 1 – First dressing on the day of starting the treatment
- 2 – Second dressing on the 3rd day
- 3 – Third dressing on the 5th day
- 4 – Fourth dressing on the 7th day
- 5 – Fifth dressing on the 10th day.

3. Complications such as delayed healing, abscess, osteomyelitis, space infections, and foreign body reactions were noted. Sockets that remained unhealed even after the 10th day were considered to be delayed healing.

Data thus collected were tabulated. The results of the collected data were subjected to statistical analysis by Chi-square test and independent *t*-test. Results were drawn accordingly.

Results

Age distribution

Patients' age ranged from 18 to 51 years, with a mean age at the time of presentations being 32.32 years, disregarding treatment groups ($P = 0.693$). All the patients were divided into three age groups as follows: <25, 25–40, and > 40. A majority of patients were found between the age group of 25 and 40 years, i.e., 28 (56%) [Table 1].

Gender distribution

Out of the fifty patients of dry socket, 29 (58%) were female and 21 (42%) were male, with a ratio of 1.4:1. However, there was no significant effect of gender on both of the treatment groups [Table 2].

Jaw distribution

Dry socket was more common in mandible than maxilla. Out of the fifty patients of dry socket, 39 (78%) found in mandible and 11 (22%) found in maxilla with a ratio of 3.54:1. In Group I, there were 19 (76%) cases in mandible and 6 (24%) cases in maxilla and in Group II, there were 20 (80%) cases in mandible and 5 (20%) cases in maxilla [Table 3]. The occurrence of dry socket more commonly in mandible than in maxilla may be because of thick cortical bone in the mandible, which is thought to be responsible for poor perforation of blood supply to the mandibular region, hence resulting in a higher incidence of dry socket.

Site distribution

The mandibular first molar (17 [43.58%]) had the highest incidence of dry socket occurrence followed by mandibular third molar (13 [33.33%]) and mandibular second molar (09 [23.07%]) [Table 4].

Number of dressings

The mean number of dressings required was 2.72 and 3.88 for Group I and Group II, respectively. The mean number of dressings required was less in Group I as compared to Group II, and thus Group I showed faster healing [Table 5].

Pain

On the day of presentation of dry socket, the mean pain scores (i.e., VASB) were 8.48 and 8.96 in Group I and Group II, respectively, which was statistically not significant ($P = 0.066$).

Posttreatment, on the 3rd day, mean pain scores (i.e., VAS1) were 3.96 and 5.8 in Group I and Group II, respectively, which was statistically significant ($P = 0.0018$).

Postoperatively, on the 5th day, mean pain scores (i.e., VAS2) were 1.68 and 3.68 in Group I and Group II, respectively, which was statistically significant ($P = 0.0001$).

Postoperatively, on the 7th day, mean pain scores (i.e., VAS3) were 0.44 and 1.71 in Group I and Group II, respectively, which was statistically significant ($P = 0.0000$).

Table 1: Distribution of age group

Groups	<25	25-40	>40	Total	χ^2	*P*
Group I (alvogyl)	6	14	5	25	0.73	0.693 (NS)
Group II (ZOE)	4	14	7	25		
Total	10	28	12	50		

ZOE=Zinc oxide eugenol; NS=Not significant

Table 2: Gender distribution of dry socket

Groups	Male	Female	Total	χ^2	*P*
Group I (alvogyl)	10	15	25	0.08	0.775 (NS)
Group II (ZOE)	11	14	25		
Total	21	29	50		

ZOE=Zinc oxide eugenol; NS=Not significant

Table 3: Distribution in jaws (maxilla/mandible)

Groups	Maxilla	Mandible	Total	χ^2	*P*
Group I (alvogyl)	06	19	25	5.71	0.733 (NS)
Group II (ZOE)	05	20	25		
Total	11	39	50		

ZOE=Zinc oxide eugenol; NS=Not significant

Table 4: Site distribution in the lower jaw

Groups	LM1	LM2	LM3	Total
Group I (alvogyl)	8	5	6	19
Group II (ZOE)	9	4	7	20
Total	17	9	13	39

ZOE=Zinc oxide eugenol; LM=Lower molar

Table 5: Comparison of mean number of dressings

Groups	Mean±SD	*P*
Group I (alvogyl)	2.72±0.94	0.0003 (S)
Group II (ZOE)	3.88±1.13	

ZOE=Zinc oxide eugenol; S=Significant; SD=Standard deviation

Postoperatively, on the 10th day, mean pain scores (i.e., VAS4) were 0.12 and 0.92 in Group I and Group II, respectively, which was statistically significant ($P = 0.0202$). Regardless of the treatment the VAS score changed during the follow-up period; however, the intensity of pain decreased more rapidly in Group I [Table 6]. The mean time required for complete pain relief was 6.52 days and 9.06 days for Group I and Group II, respectively, which was statistically significant ($P = 0.0003$) [Table 7].

Healing

Pretreatment, at the day of presentation, mean healing scores (i.e., HLWB) were 2.12 and 2.08 in Group I and Group II, respectively, of which the difference was not statistically significant ($P = 0.8930$).

Posttreatment, on the 3rd day, mean healing scores (i.e., HLW1) were 3.44 and 2.8 in Group I and Group II, respectively, which was statistically significant ($P = 0.0285$).

Postoperatively, on the 5th day, mean healing scores (i.e., HLW2) were 1.68 and 3.68 in Group I and Group II, respectively, which was statistically significant ($P = 0.0038$).

Postoperatively, on the 7th day, mean healing scores (i.e., HLW3) were 0.44 and 1.71 in Group I and Group II, respectively, which was statistically significant ($P = 0.0045$).

Postoperatively, on the 10th day, mean healing scores (i.e., HLW4) were 0.12 and 0.92 in Group I and Group II, respectively, which was statistically significant ($P = 0.0099$).

The mean time required for almost complete healing was 7.47 days and 9 days for Group I and Group II, respectively, which was statistically significant ($P = 0.0420$).

Complications

Two patients (8%) of Group I and 9 patients (36%) of Group II showed delayed healing as a complication. Group II showed greater percentage of complications than Group I. This difference was statistically significant ($P = 0.017$).

Table 6: Comparison of pain using Visual Analog Scale

Visual Analog Scale	Mean±SD		*P*
	Alvogyl	ZOE	
VASB	8.48±1.05	8.96±0.73	0.066 (NS)
VAS1	3.96±1.52	5.8±1.87	0.0018 (S)
VAS2	1.68±1.52	3.68±1.89	0.0001 (S)
VAS3	0.44±0.92	2.52±1.71	0.0000 (S)
VAS4	0.12±0.44	0.92±1.61	0.0202 (S)

VAS=Visual Analog Scale; SD=Standard deviation; NS=Not significant; S=Significant; ZOE=Zinc oxide eugenol

Table 7: Mean time required for complete pain relief

Groups	Mean±SD	*P*
Group I (alvogyl)	6.52±1.88	0.0003 (S)
Group II (ZOE)	9.06±2.14	

SD=Standard deviation; ZOE=Zinc oxide eugenol; S=Significant

Discussion

AO (dry socket) can be defined as the inflammation of the extraction socket occurring 1–4 days postoperatively, characterized by intense throbbing pain, accumulation of disintegrated clot and food debris in the socket, and malodor. Around 95%–100% of patients report within 7 days of surgery with pain.[3] Different risk factors have been associated with the development of postextraction dry socket such as difficulty of extraction, surgeon skill, the use of oral contraceptives, deficient intraoperative cleaning of the socket, advanced age, female sex, smoking, excessive use of vasoconstrictors during tooth extraction, and immune suppression.[5]

The main etiological factor for dry socket has been suggested to be an increased local fibrinolytic activity. The increase in fibrinolytic activity might result in a premature loss of the blood clot after extraction. Fibrinolysis, which is the result of plasminogen pathway activation, can be accomplished by direct (physiologic) or indirect (nonphysiologic) activator substances.[6] Pain occurs because of the release of kinins following tissue trauma, exposure of nerve endings to air, food and fluids in bare bone of the extraction socket, and infectious process which releases tissue activators and pain mediators.[7]

The age range of the patients in the present study was 18–51 years, with a mean age of 32.32 years. The relation of age group and dry socket was found to be statistically significant in the present study. Majority of the patients were in their third decade of life. Similar finding was observed by Majati *et al*.,[8] who reported the affected age range to be from 15 to 65 years, with a mean age of 32.78 years. Rauf *et al*.[9] found a mean age of 32.9 years at the time of presentation of patients with dry socket. In the study by Fahimuddin *et al*.,[7] the mean age at the time of presentation of patients with dry socket was found to be 31.68 years.

In the present study, the patients with dry socket were divided into three age groups as follows: <25 years, 25–40 years, and >40 years. Of these, a majority of patients with dry socket were found in the age group of 25–40 years. Faizel *et al*.[10] also found the relation of age group and dry socket to be statistically significant with the highest incidence of dry socket in the age group of 21–40 years. The occurrence of dry socket in this age group may be because of more solid nature of bone which is relatively disease free that can lead to difficult and traumatic extraction. The prevalence of dry socket increases with increase in extraction difficulty and surgical trauma which could be due to more release of direct tissue activators secondary to bone marrow inflammation.[7]

Out of the fifty patients included in the present study, 29 (58%) were female and 21 (42%) were male [Figure 1]. This showed a female preponderance with a female-to-male ratio of 1.4:1. These results are in accordance with the studies done by Faizel *et al*.,[10] Majati *et al*.,[8] Rauf *et al*.,[9] and Pal *et al*.[11] However, these findings are in contrast to the results

of Fahimuddin *et al*.,[7] who reported 45 males and 15 females with dry socket in their study with a male-to-female ratio of 3:1. This gender predilection may be attributed to a better health-seeking behavior of females, but some researchers have associated it with hormonal changes and others with the use of oral contraceptive pills, which increase fibrinolytic activity in blood and saliva of women during the menstrual phase.[12]

In the present study, dry socket was more common in mandible than maxilla. Out of the fifty patients of dry socket, 39 (78%) were found in mandible and 11 (22%) were found in maxilla with a ratio of 3.54:1. There was no significant effect of site on both the treatment groups (P = 0.733) [Figure 2]. These findings are in accordance with the studies done by Faizel *et al*.,[10] Majati *et al*.,[8] Fahimuddin *et al*.,[7] Upadhyaya and Humagain,[12] and Heasman and Jacobs,[13] who reported significantly higher incidence of dry socket in the mandible as compared to the maxilla.

In the present study, the mandibular first molar (17 [43.58%]) had the highest incidence of dry socket occurrence followed by mandibular third molar (13 [33.33%]) and mandibular second molar (09 [23.07%]) [Figure 3]. Similar findings were observed by Fahimuddin *et al*.[7] in their study who reported the highest incidence of dry socket in mandibular first molar

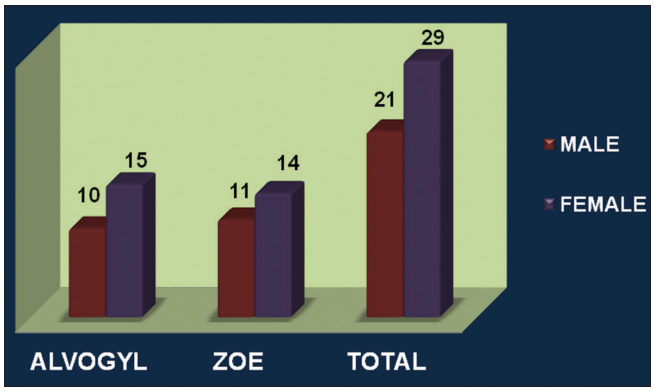

Figure 1: Graph showing gender distribution of dry socket in ALVOGYL group and ZOE group

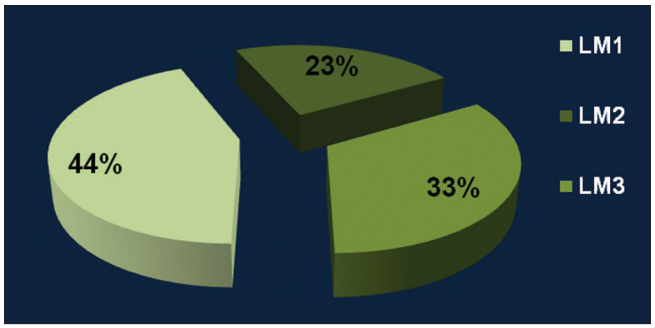

Figure 3: Graph showing site distribution of dry socket in the lower jaw

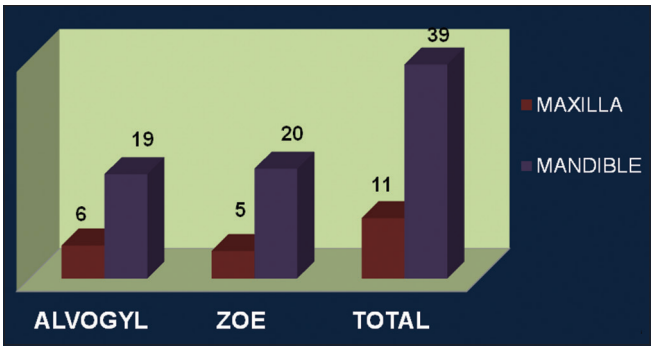

Figure 2: Graph showing distribution of dry socket in both the jaws (maxilla/mandible)

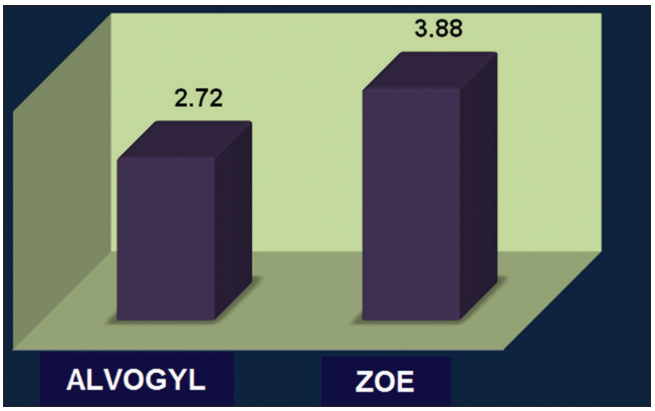

Figure 4: Graph showing comparison of mean numbers of dressings in ALVOGYL group and ZOE group

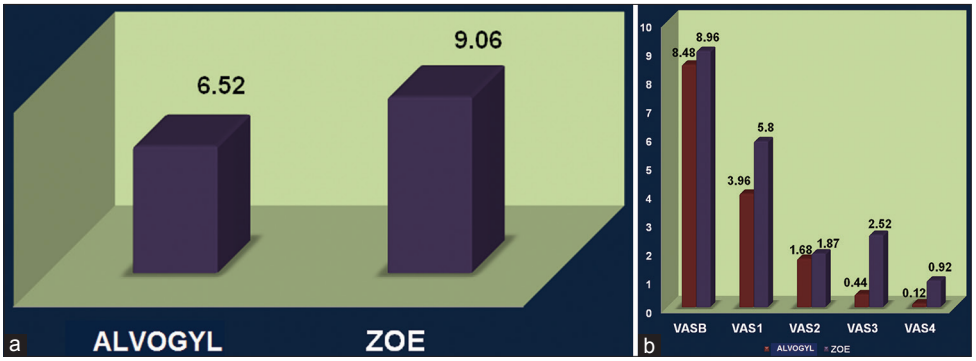

Figure 5: (a) Graph showing mean time required for complete pain relief in ALVOGYL group and ZOE group. (b) Graph showing mean pain score using Visual Analog Scale

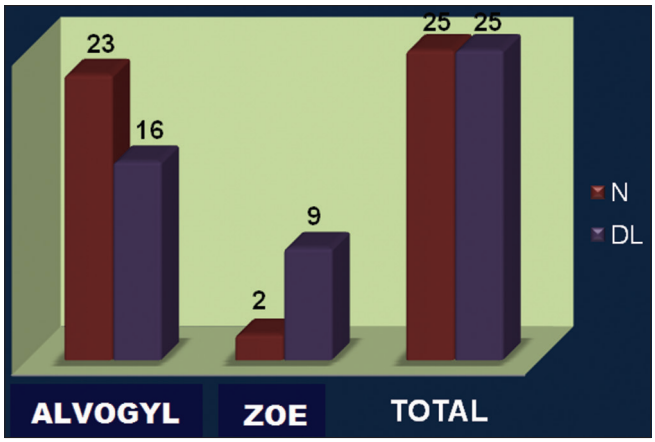

Figure 6: Graph showing complications in ALVOGYL group and ZOE group

followed by mandibular third molar and mandibular second molar. Majati *et al*.[8] found the highest incidence of dry socket in the mandibular third molar followed by mandibular second molar and mandibular first molar. Faizel *et al*.[10] also observed the highest incidence of dry socket in mandibular third molar. The possible reason for this difference may be the dental treatment neglect of the patient as well as the high caries index since most of the first molars that were extracted were grossly decayed. Grossly decayed teeth usually result in pathologic fracture during extraction, thus increasing the difficulty level of extraction.

In the present study, the mean number of dressings required was 2.72 and 3.88 for alvogyl group and ZOE group, respectively, for healing of the socket [Figure 4]. Similar findings were observed by Faizel *et al*.[10] in their study who found the average number of dressings required in the alvogyl group to be 3 and in the zinc oxide group to be 4. This showed that alvogyl required lesser number of dressings and thus lesser time for healing than that of ZOE.

In the present study, the mean time required for complete pain relief in alvogyl group was 6.52 ± 1.88 days and in ZOE group, it was 9.06 ± 2.14 days [Figure 5a and b]. This difference in complete pain relief between the two groups was statistically significant ($P = 0.0003$). Similar observations were made by Faizel *et al*.[10] in their study who found the mean time for complete pain relief of 6.47 days in alvogyl group and 8.64 days in the ZOE group ($P < 0.0001$). Majati *et al*.[8] reported the mean period of 4.2 days for complete pain relief in the ZOE group.

Faizel *et al*.[10] did a prospective study to evaluate and compare the effectiveness of neocone, alvogyl, and ZOE intraalveolar dressings for the management of dry socket. They found that alvogyl was superior to the other two medications for providing initial pain relief. However, neocone provided complete pain relief and the healing was fastest with neocone.

In the present study, the only complication observed was delayed healing. The cases of dry socket which remained unhealed even after the 10th day were considered to be delayed healing. Two cases of delayed healing were reported in the alvogyl group on the 10th day, whereas nine cases of delayed healing were reported in the ZOE group [Figure 6]. Thus, it was observed that there were less number of complications in alvogyl group as compared to the ZOE group.

In 2015, Tasoulas *et al*. reported a case of a 56-year-old female who presented with chronic infection in the area of second left mandibular premolar, which had been extracted about 1 year ago. Panoramic radiograph revealed a well-defined radiolucent lesion resembling a nonhealed postextraction socket. A purulent darkly pigmented mass was surgically removed from the postextraction area. The patient's past dental history revealed that following extraction, AO had developed, which was managed with the placement of alvogyl (containing eugenol, iodoform, butamben, and penqhwar fibers) in the socket every 4–5 days. The patient did not return for alvogyl removal after the third application. Thus, they concluded that failure to remove medicament such as alvogyl from the dry socket might result in a persistent foreign body reaction.[14]

Conclusion

The present study concludes that alvogyl is the most successful combination for the management of dry socket. ZOE is a cost-effective and easily available medicament for dressing. Although both the medicaments showed positive outcomes, alvogyl required least number of dressings and was quicker in providing lasting pain relief. It may therefore be advantageous to use alvogyl dressings to facilitate faster recovery to the patients; this may translate into earlier return to work and productivity. However, larger sample size is required to definitely prove that alvogyl is indeed superior to ZOE in spite of its cost to practicing dental surgeon. In addition, further researches should include patients with systemic diseases as well as medically compromised patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. 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.
2. Alwraikat AA. Alveolar osteitis: Incidence and risk factors following third molar surgery in Jordan. Pak Oral Dent J 2009;29:19-22.
3. Sheikh MA, Kiyani A, Mehdi A, Musharaf Q, Pathogenesis and management of dry socket (alveolar osteitis). Pak Oral Dent J 2010;30:323-6.
4. Preetha S. An overview of dry socket and its management. J Dent Med Sci May 2014;13:32-5.
5. Torres-Lagares D, Infante-Cossio P, Gutierrez-Perez JL, Romero-Ruiz MM, Garcia-Calderon M, Serrera-Figallo MA, *et al.* Intra-alveolar chlorhexidine gel for the prevention of dry socket in mandibular third molar surgery. A pilot study. Med Oral Patol Oral Cir

Bucal 2006;11:E179-84.
6. Kiran S, Naik VG, Khandeparker RV, Jain H, Berwal V. Current recommendations for treatment of dry socket-a review. J Adv Med Dent Sci Res 2014;2:108-13.
7. Fahimuddin, Abbas I, Khan M, Rehman AU. Management of dry socket: A Comparison of two treatment modalities. Pak Oral Dent J 2013;33:31-4.
8. Majati SS, Kulkarni D, Kotrashetti SM, Lingaraj JB, Janardhan S. Study of dextranomer granules in treatment of alveolar osteitis: A prospective study of 50 Cases. JIOH 2010;2:99-103.
9. Rauf MA, Kamal A, Farooq S. Management of dry socket: Hydrogen peroxide as an irrigant. PJMHS 2014;8:772-3.
10. Faizel S, Thomas S, Yuvaraj V, Prabhu S, Tripathi G. Comparision between neocone, alvogyl and zinc oxide eugenol packing for the treatment of dry socket: A double blind randomised control trial. J Maxillofac Oral Surg 2015;14:312-20.
11. Pal US, Singh BP, Verma V. Comparative evaluation of zinc oxide eugenol versus gelatin sponge soaked in plasma rich in growth factor in the treatment of dry socket: An initial study. Contemp Clin Dent 2013;4:37-41.
12. Upadhyaya C, Humagain H. Prevalence of dry socket following extraction of permanent teeth at Kathmandu University Teaching Hospital (KUTH), Dhulikhel, Kavre, Nepal: A study. Kathmandu Univ Med J (KUMJ) 2010;8:18-24.
13. Heasman PA, Jacobs DJ. A clinical investigation into the incidence of dry socket. Br J Oral Maxillofac Surg 1984;22:115-22.
14. Tasoulas J, Daskalopoulos A, Droukas C, Nonni A, Nikitakis NG. An unusual microscopic pattern of foreign body reaction as a complication of dry socket management. Oral Surg Oral Med Oral Pathol Oral Radiol 2018;125:e118-23.