



ORIGINAL ARTICLE

Dental Science

COMPARATIVE STUDY OF USEFULNESS OF ALVOGYL AND ZINC OXIDE EUGENOL AFTER SALINE IRRIGATION FOR MANAGEMENT OF DRY SOCKET

**KEY WORDS:** Alvogyl, pain relief, Zinc oxide eugenol, dressing

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ABSTRACT

**Background-** Dry socket is a clinical complication of considerable importance. It remains the most commonly encountered complication following extraction of teeth by general dentists and specialists.

**Aim-** To study usefulness of alvogyl and zinc oxide eugenol after saline irrigation for management of dry socket.

**Methods-** Forty four patients who underwent extraction of teeth and satisfying the inclusion and exclusion criteria were included in the study. Patients who were diagnosed to have dry socket were randomly allocated to receive either Zinc oxide Eugenol or Alvogyl.

**Results-** Zinc oxide eugenol had a mean value of 28.11 minutes for initial pain relief whereas Alvogyl had a mean value of 11.68 minutes. Alvogyl dressing is statistically significant from zinc oxide eugenol dressing in initial time for pain relief. On comparing the number of dressing changed between the two groups, alvogyl had lesser number of dressings than zinc oxide eugenol.

**Conclusion-** Alvogyl showed better results in the form of shorter time required for pain relief, lesser visits for dressing change and faster clinical healing of the socket than Zinc oxide eugenol. Thus Alvogyl is better for the management of dry socket.

INTRODUCTION

As per definition, Alveolar osteitis (AO) is 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.<sup>1</sup> Synonymous terms are dry socket, fibrinolytic alveolitis, alveolitis sicca dolorosa, postoperative alveolitis, alveolalgia, septic socket, necrotic socket, localized osteomyelitis etc.<sup>2</sup>

Etiology behind dry socket is multifactorial. Such factors may include age, sex, nutritional deficiency and decreased body resistance. Important local factors include anatomical location, trauma during surgery, smoking, local circulation, fibrinolysis of clot and vasoconstrictors.<sup>3,4</sup> Microorganisms play a key role in developing dry socket. *Treponema denticola* an organism found abundantly in association with the gingival disease have extracellular plasmin like activity.<sup>5</sup>

Treatment of AO can be either pharmacological or nonpharmacological. Management of alveolar osteitis remains controversial as no single method has gained universal acceptance as the condition cannot be treated as long as the etiology has not been firmly established. 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.<sup>6,7</sup> Keeping above facts in mind, we conducted this study with the aim of comparison of usefulness of alvogyl and zinc oxide eugenol after saline irrigation for management of dry socket.

METHODS

The study was conducted at a the department of oral and maxillofacial surgery of a tertiary care teaching dental hospital of northern India. This prospective study was conducted on forty four patients seeking treatment for dry socket after extraction. Study subjects were divided into 4 groups as per severity of pain. A. Mild (I): Study subjects had annoying (bothering) pain during most awaking hours but did not need analgesics. B. Moderate (II): Study subjects had pain that required and was relieved by analgesics but that did not interfere with normal daily activities. C. Severe (III): Study subjects had pain that was not relieved by analgesics but that did not interfere with normal daily activities but that did not interfere with normal daily activities. D. Agonizing (IV): Study subjects had pain that was not relieved by analgesics but that did not interfere with normal daily activities and that inter- fered with normal daily activities.

Study subjects within each group were randomly divided into two subgroups, each of which named after the treatment modality that it would receive. All patients underwent brief saline irrigation of the socket with 2ml normal saline (0.9% solution) to remove any debris. For the first subgroup, Alvogyl (Alv) was lightly packed into the ES. For patients in the second subgroup (I+Z), the extraction socket was irrigated with 15mL warm normal 0.9% saline and then lightly packed with a cotton pellet impregnated with freshly prepared zinc oxide eugenol paste (ZOE).

Inclusion criteria for the study subjects were pain after simple dental extraction (forceps extraction), diagnosis of AO (dry socket) and age between 25 and 55 years. Exclusion criteria were signs or symptoms of an infected socket, systemic or local conditions hindering or otherwise affecting healing, disorders causing bleeding tendencies, tooth extraction peri-menstrually, pregnancy, lactation, or use of oral contraceptives, hormonal disturbances, and smoking.

Following parameters for assessing treatment effectiveness were taken into account,

**Curative:** Treatment was followed by a pain-free day without other Curative medication (or pain became too slight to be annoying or to lead the patient to seek medical or dental intervention);

**Palliative:** Treatment was followed by decreased pain severity but Palliative pain remained at least annoying, or treatment was followed by a decrease in the dose of analgesics taken, or both;

**Ineffective:** Treatment was not followed by noticeable diminution in pain severity (and pain remained at least annoying), or the treatment had a palliative effect that was not maintained to the end of a 5 minute visit.

The total time needed after each treatment for the patient not to seek medical or dental intervention was recorded in each group in order to assess effectiveness of each method. The potency of an agent was considered high if that period was 2 days or less, moderate if it was 3 or 4 days, and low if it was 5 days or more, as the total healing period typically ranges from 7 to 10 days. Any agent who could achieve a curative effect within 1 day, thus requiring only a single application, was considered a definitive therapy.

Written and informed consent was obtained from study subjects.

Permission of ethical committee was obtained from the Institutional Ethics Committee. All the questionnaires were manually checked and edited for completeness and consistency and were then coded for computer entry. After compilation of collected data, analysis was done using Statistical Package for Social Sciences (SPSS), version 21 (IBM, Chicago, USA). The results were expressed using appropriate statistical variables.

**RESULTS**

Dry socket was found more common in male patients as compared to females. Age group of 30-40 years was most commonly involved. Dry socket incidence was lower for multiple extractions and higher for single tooth extractions.

The effectiveness of each treatment modality in each group is shown below. In all the period of pain assessment 5 min, 30 min, 1 hour, day 1, day 2, day 3 and day 5, Alvogyl was found comparatively better than Zinc oxide eugenol dressing. The initial time for pain relief was compared between the two groups. Zinc oxide eugenol had a mean value of 28.11 minutes for initial pain relief whereas Alvogyl had a mean value of 11.68 minutes. Alvogyl dressing is statistically significant from zinc oxide eugenol dressing in initial time for pain relief. (Table 1)

**Table 1: Comparison about pain relief between among study subjects**

Pain	Group	N	Mean	Std. Deviation	P Value
Initial Pain	Zinc Oxide Eugenol	22	28.11	9.28	<0.001
	Alvogyl	22	11.68	4.65	
Pain Relief after therapy	Zinc Oxide Eugenol	22	03.73	1.44	0.05
	Alvogyl	22	02.18	1.07	

On comparing the number of dressing changed between the two groups, alvogyl had lesser number of dressings than zinc oxide eugenol and this finding was found to be statistically significant. (Table 2)

**Table 2: Comparison about number of dressings between zinc oxide eugenol and Alvogyl**

Group	Dressings			Total	P Value
	2	3	4		
Zinc Oxide Eugenol	2	8	12	22	Significant
Alvogyl	10	9		19	

Although I+Z was curative in group. I, it was palliative in group II. Alv was palliative for group, I patients. Otherwise, both agents failed to show any positive results. Both agents were of moderate potency either when the agent was curative or palliative. No agent was recorded as a definitive therapeutic agent.

**DISCUSSION**

Dry socket is a clinical complication of considerable importance. It remains the most commonly encountered complication following extraction of teeth by general dentists and specialists. Dry socket is 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 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.

In our study, dry socket was found more common in male patients as compared to females. Study by MacGregor<sup>8</sup> showed a higher incidence of dry socket in females, which is consistent with the finding of the present study. This may be due to the fact that prior to 1960 oral contraceptives were not appreciably used<sup>1</sup>. Ygge et al.<sup>9</sup> and also Sweet and Butler<sup>10</sup> reported that oral contraceptive pills increased fibrinolytic activity in the blood and saliva of women during the menstrual phase.

In this study, age group of 30-40 years was most commonly involved. Amaratunga NA et al.<sup>11</sup> reported highest incidence of dry

socket in 3rd and 4th decades of life. Krogh HW et al.<sup>12</sup> reported a dramatic reduction in later decades. Most surgical extractions in these studies were performed in patients who were in their 3rd and 4th decades.

We observed that, dry socket incidence was lower for multiple extractions and higher for single tooth extractions. Nusair YM et al.<sup>13</sup> reported a lower incidence of dry socket after multiple extractions than after single tooth extractions, and these findings are consistent with the present study. It could be due to less pain tolerance in patients with single extractions compared to patients with multiple extractions, whose teeth have deteriorated significantly. Moreover, multiple extractions involving periodontally diseased teeth may be less traumatic, and it is not infrequent in such situations to opt for primary alveoloplasty and primary closure. The latter may confer some clot protection benefits.

We observed that, in all the period of pain assessment 5 min, 30 min, 1 hour, day 1, day 2, day 3 and day 5, Alvogyl was found comparatively better than Zinc oxide eugenol dressing. The initial time for pain relief was compared between the two groups. Zinc oxide eugenol had a mean value of 28.11 minutes for initial pain relief whereas Alvogyl had a mean value of 11.68 minutes. Pain relief is considered the primary goal of treatment in case of dry socket. The composition of both Alvogyl and Zinc oxide eugenol contains eugenol, which acts as the sedative and anodyne effects as well as had antibacterial properties. Alvogyl also contains butamben (anesthetic) and iodoform (antimicrobial). Bloomer et al.<sup>14</sup> suggested using Zinc oxide eugenol in managing dry socket. Retardation of healing and inflammation were reported by Alexander et al.<sup>15</sup> when using Alvogyl. Faizel et al.<sup>16</sup> in his study found the mean time for complete pain relief of 6.47 days in alvogyl group and 8.64 days in the ZOE group.

In the present study, on comparing the number of dressing changed between the two groups, alvogyl had lesser number of dressings than zinc oxide eugenol and this finding was found to be statistically significant. Similar findings were observed by Faizel et al.<sup>16</sup> 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.

**CONCLUSION**

This study observed that Alvogyl is superior thus a better alternative to the Zinc oxide eugenol dressing for providing pain relief, fewer visits and faster clinical healing. Further studies are warranted to support our findings.

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