

EFFECTIVENESS IN PAIN CONTROL OF ALVOGYL VERSUS ZINC OXIDE-EUGENOL IN PATIENTS WITH DRY SOCKET: A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Objectives: To compare the effectiveness of pain control between Alvogyl and Zinc Oxide in individuals experiencing dry socket.

Materials and Methods: This randomized controlled trial was conducted at Bacha Khan College of Dentistry, Mardan with the inclusion of 60 participants (30 in each group). Inclusion criteria comprised patients with dry socket occurring two or three days after extraction, aged between 12 and 60 years, of both genders, and Pakistani nationals. Exclusion criteria included medically compromised patients, pregnant females, individuals with a history of radiotherapy, and those with any known allergy to eugenol. One group was treated with Alvogyl, while the other received Zinc oxide eugenol packing. The time to initial pain relief (in minutes) and complete cessation of pain (in days) were recorded through phone calls. The Student t-test was employed to compare the outcome variable between the two groups.

Results: The mean age was 29.27 ± 6.60 years, with 30 females (50%) and 30 males (50%). The time for initial pain relief was significantly longer for ZnO Eugenol (26.04 ± 3.82 minutes) compared to Alvogyl (6.81 ± 2.25 minutes), with a statistical significance of $p < 0.001$. Similarly, the time for final pain relief was also significantly longer for ZnO Eugenol (8.78 ± 0.24 days) compared to Alvogyl (6.88 ± 0.64 days), with a p-value of less than 0.001.

Conclusion: Based on our results, it can be concluded that Alvogyl is superior to Zinc oxide eugenol in the management of dry socket, particularly in terms of pain relief.

Key words: Alvogyl, alveolar osteitis, dry socket, osteitis sicca, pain

INTRODUCTION

Dry socket, or alveolar osteitis (AO), is a common and unpleasant complication that frequently arises after the extraction of permanent teeth^{1,2}. Despite efforts to refine its definition with terms like AO, localized osteitis, and others, the colloquial use of the term "dry socket". This condition is

characterized by severe throbbing pain, along with the accumulation of disintegrated clot and debris in the socket, leading to malodor. The precise cause of dry socket remains elusive, though several theories propose contributing factors³. These include the early dislodgment of the blood clot from the extraction site, trauma induced during surgery, secondary infections, nutritional deficiencies, mechanical dislodgement of clots, reduced vascularity in the area, and drug-induced factors such as the use of oral contraceptives and tobacco⁴.

In addressing the challenges posed by dry socket,

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Alvogyl, developed by Septodont in France, serves as an intra-socket medication specifically formulated for this purpose. Alvogyl's composition includes Iodoform (15.8%), known for its antimicrobial properties; Butylparaminobenzoate (25.7%), functioning as an anesthetic; Eugenol (13.7%), which not only retards the inflammatory process but also relieves pain by inhibiting the action of prostaglandins; and Penghawar (3.5%), an anti-inflammatory agent⁵. This carefully crafted combination aims to tackle the multifaceted aspects of dry socket, providing relief from pain, preventing infection, and supporting the overall healing process in the postoperative period. By addressing these various ingredients, Alvogyl endeavors to enhance the effectiveness of dry socket treatment and improve the patient's post-extraction experience.

Dry socket is common facing issue prevalence in our dental practices. There is a lack of well-controlled randomized clinical trials in our population which can provide highest level of evidence. Therefore, this study will provide evidence-based guidelines for selecting appropriate materials in the management of dry socket.

The objective of this study was to compare the effectiveness of pain control between Alvogyl and Zinc Oxide in individuals experiencing dry socket.

MATERIALS AND METHODS

This randomized controlled trial was conducted at Bacha Khan College of Dentistry, Mardan after obtaining ethical approval from the ethical committee (108/BKCD, Dated:2/1/2023), within a duration of one month. The calculated sample size was 20 (10 in each group) at a 95% confidence interval and 99% power. The mean time for pain relief for Alvogyl was 6.478 ± 0.45 minutes, and for ZnO Eugenol, it was 8.645 ± 3.46 minutes, as reported in a previous study⁶. However, for the purpose of normality, a total of 60 participants were included (30 in each group). The participants were selected using a non-probability sampling consecutive technique. Inclusion criteria comprised patients with dry socket occurring two or three days after extraction, aged between 12 and 60 years, of both genders, and Pakistani nationals (based on National identity card). Exclusion criteria were medically compromised patients, pregnant females, individuals with a history of radiotherapy, and those with any known allergy to eugenol.

The participants were randomly divided into two groups (alvogyl and zinc oxide) using the block randomization technique. After obtaining verbal informed consent from all participants, a detailed history and collection of demographic data were conducted. The dry socket was examined, effective local anesthesia was administered, and it was cleaned with normal saline. Experimental group was treated with Alvogyl, while the control group received Zinc oxide eugenol packing. The patients were blinded to the intervention.

Prior to introducing medication into the socket, observations were made regarding clinical findings such as pain levels, inflammation severity, and the extent of exposed bone. The study excluded individuals allergic to Alvogyl/ZOE components or the prescribed medications, pregnant patients, those on oral contraceptives, and medically compromised individuals. The time to initial pain relief (in minutes) and complete cessation of pain (in days) were recorded through phone calls.

Data analysis was conducted using SPSS version 23. Means and standard deviations (SD) were calculated for numeric data such as age and time to relieve pain. Frequency and percentages were computed for categorical variables such as gender and age group. The Student t-test was employed to compare the outcome variable between the two groups, with a significance level set at $P \leq 0.05$.

RESULT

The mean age ($p=0.54$), gender distribution ($p=0.999$), and age groups ($p=0.79$) in the Zinc Eugenol and Alvogyl groups were not statistically different. The details are presented in Table 1.

Table 2 presents a comparison of the time to cease pain between the ZnO Eugenol and Alvogyl groups. The time for initial pain relief was significantly longer for ZnO Eugenol (26.04 ± 3.82 minutes) compared to Alvogyl (6.81 ± 2.25 minutes), with a p-value of less than 0.001. Similarly, the time for final pain relief was also significantly longer for ZnO Eugenol (8.78 ± 0.24 days) compared to Alvogyl (6.88 ± 0.64 days), with a p-value of less than 0.001. These results, as determined by the Two Sample t-test, suggest that Alvogyl provides quicker relief from pain than ZnO Eugenol in both the initial and final phases, and the observed differences are

statistically significant.

In both genders, Alvogyl was statistically more effective than Eugenol ($P < 0.001$) in providing initial pain relief and achieving the complete cessation of pain than zinc oxide Eugenol (Fig 1 and 2).

DISCUSSION

Our findings showed that Alvogyl was more effective than Eugenol in relieving pain in the management of dry socket. Researchers have sought effective methods to prevent dry socket, the most common complication following tooth extraction. Various approaches, including systemic antibiotics, topical antibiotics, chlorhexidine, para-hydroxybenzoic acid, tranexamic acid, polylactic acid, steroids, eugenol-containing dressings, lavage, and 9-aminoacridine, have been explored⁸. However, the field remains contentious, lacking a universally accepted preventive method. Despite numerous interventions proposed, the complex nature of dry socket prevention underscores the need for further research to establish consensus on effective preventive measures in dental practice^{7,8}.

In our study, males and females were equal in number, indicating that dry socket does not exhibit a gender predilection. We excluded dry socket susceptible patients like on oral contraceptive and pregnant. Literature indicated a higher occurrence of dry socket in females. This correlation may be attributed to the historical era before 1960 when oral

contraceptives were less commonly used⁹. Previous studies⁹⁻¹¹ highlighted the impact of oral contraceptive pills on increasing fibrinolytic activity in the blood and saliva of women during the menstrual phase¹⁰. Study by Devesh et al. revealed a significantly elevated incidence of alveolar osteitis (AO) among contraceptive users, suggesting a potential

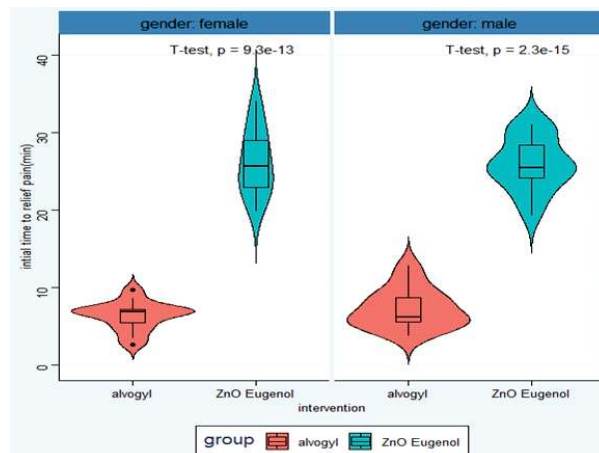


Fig 1: Comparison of initial pain relief in Alvogyl versus Eugenol

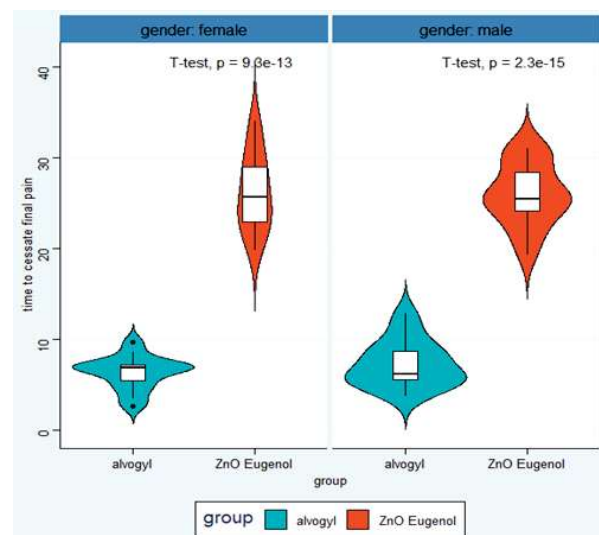


Fig 2: Comparison of final cessation pain in Alvogyl versus Eugenol

Table 2: Comparison of time to cessate pain in Eugenol versus Alvogyl

Characteristic	ZnO Eugenol, N = 30	alvogyl, N = 30	p-value*
Time for initial pain relief (minutes)	26.04 ± 3.82	6.81 ± 2.25	<0.001
Time for final pain relief (days)	8.78 ± 0.24	6.88 ± 0.64	<0.001

*Two Sample t-test

Table 1: Distribution of age and gender in both groups

Variable	Characteristic	ZnO Eugenol, N = 30	Alvogyl, N = 30	p-value*
Age(years)	Mean ± SD	29.80 ± 6.24	28.73 ± 7.00	0.54
Gender	Female	15 (50.00)	15 (50)	0.999
	Male	15 (50.00)	15(50)	
Age group(years)	20-30	17 (56.67)	19 (63.33)	0.79**
	31-45	13 (43.33)	11 (36.67)	

* Welch Two Sample t-test; **Pearson's Chi-squared test

association between oral contraceptive use and an increased vulnerability to dry socket⁹. These results contribute valuable insights into the factors influencing dry socket prevalence, emphasizing the role of oral contraceptives and hormonal influences on fibrinolytic activity in this context¹¹.

A randomized controlled trial involved a total of 40 patients who were randomly assigned to two groups, each comprising 20 patients. Group A received Alvogyl paste as an intra-socket medication, while Group B was treated with Zinc oxide eugenol paste as an obtundent for the extraction socket. The results revealed a significant reduction in pain intensity in the Alvogyl group compared to the Eugenol group. Additionally, all patients in the Alvogyl group exhibited complete healing by the 5th day, whereas only 12 patients in the Eugenol group achieved the same level of healing. The researchers concluded that both medicaments demonstrated positive outcomes in managing dry socket, but Alvogyl exhibited slightly superior efficacy compared to Zinc oxide eugenol in their study. These findings suggest that Alvogyl may be a more effective option for promoting pain relief and accelerating the healing process in cases of dry socket compared to Zinc oxide eugenol. These results are consistent with the current study⁹.

In another study, the effectiveness of Alvogyl and Eugenol in pain relief for 30 patients with dry socket was compared. The study reported that Alvogyl demonstrated superior efficacy compared to Zinc Oxide Eugenol (ZOE) dressing in providing relief from pain associated with dry socket. This finding suggests that Alvogyl may be a more effective option for alleviating pain in patients experiencing dry socket when compared to the use of ZOE dressing¹¹.

This study has several limitations, including a small sample size, being conducted at a single center, and a lack of control over potential confounders such as educational level, medical conditions, and medication use. Other limitation of the study was verbal informed consent instead of written.

CONCLUSION

Based on our results, it can be concluded that Alvogyl is superior to Zinc oxide eugenol in the management of dry socket, particularly in terms of pain relief.

REFERENCES

1. 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(2):193-8.
2. Kamal A, Omar M, Samsudin A. Management of Dry Socket: New regenerative techniques emerge while old treatment prevails. *Dent Revi*. 2022;2(1):100035.
3. Rakhshan V. Common risk factors of dry socket (alveolitis osteitis) following dental extraction: A brief narrative review. *J Stomatol Oral Maxillofac Surg*. 2018;119(5):407-11.
4. Mamoun J. Dry socket etiology, diagnosis, and clinical treatment techniques. *J Korean Assoc Oral Maxillofac Surg*. 2018;44(2):52-8.
5. Lenka S, Rathor K, Varu R, Dalai RP. Comparison between Alvogyland Zinc Oxide Eugenol Packing for the Treatment of Dry Socket: A Clinical Study. *Ind J Public Health Res Develop*. 2019;10(11):51-3.
6. Faizel S, Thomas S, Yuvaraj V, Prabhu S, Tripathi G. Comparison 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.
7. Kolokythas A, Olech E, Miloro M. Alveolar osteitis: a comprehensive review of concepts and controversies. *Int J Dent*. 2010;2010:1-6.
8. Daly BJ, Sharif MO, Jones K, Worthington HV, Beattie A. Local interventions for the management of alveolar osteitis (dry socket). *Cochrane Databas Sys Rev*. 2022;12(9):CD006968.
9. Devesh T, Yogendra KS. Comparison between Alvogyl and Zinc Oxide Eugenol Packing for the Treatment of Dry Socket. *Ann Int Med Dent Res*. 2020;7:51-4.
10. Khan ZA, Prabhu N, Ahmed N, Lal A, Issrani R, Maqsood A, et al. A comparative study to evaluate the effect of honey and zinc oxide eugenol dressing for the treatment of dry socket: a double-blind randomized controlled trial. *Appl Sci*. 2021;12(1):6.
11. Lenka S, Rathor K, Varu R, Dalai RP. Comparison between Alvogyland Zinc Oxide Eugenol Packing for the Treatment of Dry Socket: A Clinical Study. *Indian J Public Health Res Develop*. 2019;10(11):51-3.



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