

ORIGINAL ARTICLE

Efficacy of Intra Alveolar Placement of Chlorhexidine 0.2% with Metronidazole 10mg Gel for Prevention of Dry Socket

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ABSTRACT

Objective: To evaluate the efficacy of intra alveolar placement of chlorhexidine 0.2% with metronidazole 10mg gel for prevention of dry socket.

Material and Methods: This comparative study included patients having only mandibular mesioangular Class 1, Class A impaction with same difficulty index. Patients were divided into two groups. In group A After the extraction of tooth Chlorhexidine 0.2% with Metronidazole 10mg was applied in the socket, while in group B After the extraction of tooth socket was irrigated with normal saline and patients were recalled for assessment of pain by wong bakers scale (facies) on day 1, day 3 and day 5 post-operatively.

Results: The average age of patients of group A was 28.38+4.52 years and average age of group B patients was 37.04+7.32 years. Females were found in majority in both groups as 63.6% in group A and 52.3% in group B. Average of pain score (WBFPS) on first to 5th operative days was significantly lower in group A as compared to group B, p-values were quite significant. Mean duration of surgery was almost equal among both groups. Frequency of dry socket was significantly lower in group A as 47.7% in contrast to group B as 88.6%, (p=0.001).

Results: Intra alveolar placement of chlorhexidine 0.2% with metronidazole 10mg gel was found to be effective in terms of lower post-operative pain and prevention of dry socket in contrast to normal saline

Keywords: Third molar, Dry Socket, Metronidazole, Chlorhexidine, Normal Saline

INTRODUCTION

A pathological scenario in which a tooth struggles to settle to its natural functioning location is known as tooth impaction. Third molars that have been obstructed are a regular occurrence in dental practice. When contrasted to other teeth, third molars have a greater rate of impaction. The insufficient room around the distal of the second mandibular molar and the anterior edge of the ascending ramus of the jaw is thought to be the cause of mandibular third molar impaction. Caries, pericoronitis, cysts, tumors, and root resorption of the neighboring tooth are among disorders linked with impacted teeth.^{1,2}

Uneventful healing of the surgical site is one of the most important objectives in oral surgery after extraction of third molar.³ The worst serious consequence in the practice is "dry socket," which occurs between 2-4 days following surgery.⁴ It's a bone inflammatory condition characterized by excruciating pain, a socket that's either partly or entirely devoid of blood clots, bone exposing, and gingival redness.⁵ The frequency of occurrence in the mandible is 10 times higher than in the maxilla. It ranges from 1% to 4%, with mandibular third molars accounting for up to 46% of the total.^{6,7}

Alveolar osteitis has an etiology that is not fully established. Enhanced fibrinolysis, according to Brin H causes clot disintegration, which causes alveolar osteitis. The alveolus empties, the osseous environment is despoiled and overlaid by a yellow, grey rotten tissue layer, and the mucosa around it becomes erythematous. Based to Fazakerlev and Field⁸, it is marked by severe, incapacitating, unchangeable, and persistent agony that lasts all night. The development of dry socket is also

influenced by improper oral cleanliness and the resulting alveolar contaminants. Streptococcus alpha and beta haemolyticus, as well as treponema denticola, have been discovered to be related with dry socket, with 70% of them being aerobic and 30% being anaerobic.⁹

Several methods and techniques have been presented in the literature to aid in the avoidance of alveolar osteitis. Systemic antibiotics, topical antibiotics, chlorhexidine, para-hydroxybenzoic acid, tranexamic acid, polylactic acid, steroids, and other treatments are the best common. Chlorhexidine is a biguanide antiseptic that is commonly used in mouthwashes and bioadhesive gels. It fights a wide range of aerobic and anaerobic oral infections. The human immune system tolerates it and does not develop tolerance to it. It has been demonstrated to be useful in preventing dry socket. The use of chlorhexidine gel intra-alveolarly alleviate the sufferer of the rinse's side effects, such as discoloration or a change in flavour perception. Metronidazole is a nitroimidazole antiinfective with particular action against a variety of anaerobic bacteria. It has bactericidal properties.¹⁰

The current research is driven by a commitment to minimize dry socket issues in regular practice. Its goal is to offer a basic, easy-to-apply prophylactic therapy that may be reliably offered by general dentistry clinicians after normal extractions. It was critical that it be fast and easy to use, and that it did not need lengthy pre-operative preparing, such as a week of preoperative mouthwashes or the use of systemic antibiotics. Topical antibiotics were chosen because of their high safety profile, minimal risk of hypersensitivity, and efficacy against bacteria that cause mouth infections.¹¹

METHODOLOGY

From December 2020 to October 2021, a comparative research was conducted in the Section of Oral and Maxillofacial Surgery, Liaquat University of Medical & Health Sciences, Jamshoro, Hyderabad. Using RaoSoft sample calculator, using 95% confidence interval, 5% margin of error and population size of 20000, with reference from study “effect of intra alveolar placement of 0.2% chlorhexidine bioadhesive gel on dry socket incidence and postsurgical pain: a double-blind split mouth randomized control clinical trail9” calculated sample size is 80. 10% was added for non- responding patients, so the final sample size would be (80 + 8 = 88).

Group A (Chlorhexidine 0.2% and metronidazole 10mg gel) = 44 patients

Group B (Normal saline) = 44 patients

Inclusion Criteria:

- Patients of either gender between age group of 20-45 years.
- Patient having only mandibular mesioangular Class 1, Class A , impaction.
- Impaction with same difficulty index

Exclusion Criteria:

- Failure to attend follows up sessions
- Patient having mandibular mesioangular Class II, Class B , Class III, Class C impaction.
- Immunocompromised and pregnant patients

Data collection procedure: The university's research ethics committee granted ethical permission.. Informed / written consent was taken by patient those who were fit as per inclusion criteria. Pre operatively all the patients were diagnosed for mandibular mesioangular 3rd molar impaction clinically and with the help of radiograph. In group A after the extraction of tooth, Chlorhexidine 0.2% with Metronidazole 10mg was applied in the tooth socket, while in group B After the extraction of tooth, normal saline was used to rinse the socket and participants were recalled following extraction for a wong bakers scale (facies) pain evaluation and observation of dry socket on day 1, day 3, and day 5 post-operatively.

For categorical variables, the data was input into the Statistical Package for the Social Sciences (SPSS) 21 programme, and frequency and percentages were computed using a quantitative test. Significant was defined as a P value of less than 0.05.

RESULTS

Total 88 patients of impacted tooth were analyzed, particularly in two groups as per treatment. The average age of patients of group A was 28.38+4.52 years and average age of group B patients was 37.04+7.32 years, while overall mean age was 32.89+6.57 years. Mean age was statistically significant as per study groups (p-0.001). Table.1

Females were found in majority in both groups. 63.6% were females and 36.4% were males in group A. 52.3% were females and 47.7% were males in group B. findings were statistically insignificant as per study groups (p-0.280). Table.2

Average pain score (WBFPS) on first operative day was significantly lower in group A as WBFPS (3.40+1.40) as compared to group B as average pain sore was WBFPS

(4.03+1.30), (p-0.054) . On 3rd post-operative day pain (average WBFPS) was observed significantly lower in group A as 2.28+1.62, in contrast to group B (average WBFPS 3.0+1.75), (p-0.051). On 5th post-operative day almost pain was relieved in both groups, while average of WBFPS score was still significantly lower in group A as compared to group B (p-0.011). Table 3

Table.1: Descriptive statistics of age of study groups n=88

Study groups	Statistics				p-value
	N	Mean+SD	Minimum	Maximum	
Group A	44	28.38+4.52 years	20 years	40 years	0.001
Group B	44	37.04+7.32 years	19 years	45 years	
Total	88	32.89+6.57 years	19 years	45 years	

Group A= Chlorhexidine 0.2% with Metronidazole 10mg.
Group B= Irrigated with normal saline

Table.2: Patients distribution according to gender among study groups n=88

Gender	Study group		p-value
	Group A	Group B	
Male	16	21	0.280
	36.4%	47.7%	
Female	28	23	
	63.6%	52.3%	
Total	44	44	
	100.0%	100.0%	

Table 3: Descriptive statistics of Pain (WBFPS) score on 1, 3, 5 post-operative day n=88

Pain (WBFPS) score	N	Mean	Std. Deviation	p-value	
Score On 1 st Post Operative Day	44	3.40	1.40	0.054	
					Group A
Group B	44	4.00	1.43		
Score On 3 rd Post Operative Day	44	2.28	1.62		0.051
Group B	44	3.00	1.75		
Score On 5 th Post Operative Day	44	0.95	1.69	0.011	
Group B	44	1.86	1.57		

Table 4: Descriptive statistics of duration of surgery of both groups n=88

Duration of surgery (WBFPS)	N	Mean	Std. Deviation	p-value	
Study groups	Group A	44	32.95	7.09	0.077
	Group B	44	30.11	5.33	

Mean duration of surgery was almost equal among both groups as average surgical duration was 32.95+7.09 minutes in group A and 30.11+5.33 minutes was in group B (p-0.77). Table 4

In this study the frequency of dry socket was significantly lower in group A as 47.7% in contrast to group B as 88.6%. Table 5

Table 5: Patients' distribution according to Frequency of Dry Socket n=88

Dry socket	STUDY GROUP		p-value
	Group A	Group B	
Yes	21	39	0.001
	47.7%	88.6%	
No	23	5	
	52.3%	11.4%	
Total	44	44	
	100.0%	100.0%	

DISCUSSION

In this study the frequency of dry socket was significantly less observed after intra alveolar placement of chlorhexidine 0.2% with metronidazole 10mg gel. After transalveolar extraction of impacted third molars, Kaur J et al¹² consistently observed that topical metronidazole and chlorhexidine gel are statistically significant in lowering the prevalence of alveolar osteitis. Inamdar MN et al¹³, on the other side, asserted that both chlorhexidine gel and metronidazole gel are efficient in lowering post-operative troubles such as dry socket, anguish, and oedema after impacted 3rd molar expulsion in their research on prevention of dry socket using Chlorhexidine Gel and metronidazole Gel. Mitchell et al¹⁴ evaluated the effectiveness of a gel containing 10% metronidazole for the management of dry socket and found that when the gel was administered, the dry socket healed speedier. The usage of metronidazole for the management and prevention of dry socket was advised at the study conclusion. On the other side, Khooharo TS et al¹⁵ equated the effectiveness of metronidazole and amoxicillin as preoperative single dose treatments to standard medication in the avoidance of dry socket and found that the proportion of dry socket cases in the customary cluster was greater than in the amoxicillin and metronidazole groups.

The bio-adhesive 0.2 % chlorhexidine gel, adapted just once since the extraction of impacted third molars, appears to be a suitable alternative for the lessening of alveolitis, according to Lagares DT et al, who discovered that the presentation of alveolitis was 30.76 % in the placebo group and 17.64 % in the experimental class. It occurs as a result of prolonged recovery of the extraction site, which can be caused by premature dislodgment or a paucity of blood clot development.

The mean pain rating on the first to fifth postoperative days was substantially reduced in group A than in group B in this research, with p-values that were fairly significant. Meanwhile, Inamdar MN et al¹³ observed that on the 3rd and 7th post-operative days, the mean and probable ratio of pain in both groups were substantial for metronidazole on the 7th day, but not for chlorhexidine gel. Haraji et al¹⁷ concluded that topical chlorhexidine gel significantly reduces dry socket likelihood and also reduces postsurgical pain in patients with and without dry socket in their analysis on the consequences of intra-alveolar placement of 0.2 % chlorhexidine bioadhesive gel on dry socket occurrence and postsurgical pain. In their pilot research, Torres-

Lagares D et al¹⁶ discovered that the bio-adhesive 0.2 % chlorhexidine gel, when used only once following the extraction of blocked third molars, appears to be an effective method for reducing alveolitis.

In this study average age of patients of group A was 28.38+4.52 years and average age of group B patients was 37.04+7.32 years, while overall mean age was 32.89+6.57 years. Similarly Kaur J et al¹² reported that a set of 150 individuals were evaluated, with an average age of 30.5+2.5 years, 42.6 % of whom were women and 57.3 % of whom were men, while in this study females were found in majority in both groups as 63.6% were females and 36.4% were males in group A. 52.3% were females and 47.7% were males in group B. Similarly Khooharo TS et al¹⁵ reported that the males were 67(30%) and females were 158(70%), while inconsistently Inamdar MN et al¹³ reported the out of all 17 (56.67%) male subjects and 13 (43.34%) female subjects. This gender difference may because of study sample size and environmental variations. However, we found intra alveolar placement of chlorhexidine 0.2% with metronidazole 10mg gel effective in pain reduction and dry socket prevention. Several investigations have been conducted to determine the function of metronidazole in the avoidance of dry socket, with the conclusion that precautionary metronidazole is an efficacious technique of avoiding "dry socket" following normal dental extraction.¹⁸

CONCLUSION

It was concluded that the intra alveolar placement of chlorhexidine 0.2% with metronidazole 10mg gel was found to be effective in terms of lower post-operative pain and prevention of dry socket in contrast to normal saline. Due small sample size and single center study, it is recommended that the further large scale multicentral studies should be done on this subject.

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