



## USE OF CHLORHEXIDINE 0.2% GEL TO PREVENT ALVEOLAR OSTEITIS IN MANDIBULAR THIRD MOLAR SURGICAL EXTRACTION.

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**ABSTRACT... Objectives:** To evaluate the efficacy of 0.2% chlorhexidine gel placed intra alveolar in the prevention of alveolar osteitis after the surgical extraction of mandibular third molar. **Study Design:** Randomized Control trial. **Setting:** Department of Oral and Maxillofacial Surgery, LUMHS, Jamshoro/Hyderabad. **Period:** January 2016 to July 2016. **Material & Methods:** This study consisted of 40 patients in control group A and 40 patients of Chlorohexidine gel group B used after surgical extraction. A single dose of 0.2% bio-adhesive gel was introduced in group B while the control group A was left alone. Postoperative complications like pain, swelling, limited mouth opening, and dry socket were seen. Frequency and percentages were calculated. Mean +/- SD were calculated for quantitative variables. **Results:** On 3rd day patients reported with pain in group A were 24 and in group B were 15. Pain was seen in 4 patients (10%) on 15<sup>th</sup> day in group A while in group B no patient came with pain. 19 patients reported with dry socket on day 3 in group A and 4 patients in group B, While none of the patient encountered with Dry socket on 15<sup>th</sup> day in group in both groups. **Conclusion:** The data presented indicates that the bio-adhesive gel containing 0.2% chlorohexidine, applied post-extraction produced a better patient recovery.

**Key words:** 0.2% Chlorohexidine Gel, Alveolar Osteitis, Efficacy, Intra Alveolar, Mandibular Third Molar, Surgical Extraction.

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### INTRODUCTION

In recent era, the most routinely performed dentoalveolar surgery is the surgical removal of impacted teeth.<sup>1</sup> Mandibular third molars erupt at 17 to 21 years age. Deficient space in the dental arch, an aberrant path of eruption and late eruption sequence are the main etiological factors.<sup>2</sup> Impacted third molars often present with pericoronitis, caries of adjacent teeth, cystic lesions, neoplasms and pathologic root resorptions.<sup>3</sup> The complications which are encountered more frequently are pain, swelling and trismus followed by sensory nerve damage, dry socket, infection and hemorrhage. While complications of less occurrence are strict trismus, iatrogenic damage to adjacent second molar and iatrogenic mandibular fracture.<sup>4</sup>

The more prevalent and unpleasant complication that occurs after surgical removal of third molar is

“Alveolar Osteitis” or Dry Socket.<sup>5</sup> The condition that occurs in post extraction phase is Alveolar Osteitis. This condition accompanies pain at the extraction site that boost in brutality at any time between 1 and 3 days after the extraction. Clinical finding are partially or totally disintegrated blood clot within the alveolar socket with or without halitosis, very sensitive bone surfaces, covered by a greyish yellow layer of detritus and necrotic tissues.<sup>6,8</sup>

The factors that are responsible for occurrence of alveolar osteitis at third molar site are excessive trauma and enhanced threat of bacterial contamination.<sup>7</sup> In order to reduce the risk of its development there are numerous protocols that has been introduced or suggested that include; antifibrinolytic and clot support agent application, anti inflammatory steroidal drugs, systemic antibiotic, local antibiotics application,

chlorhexidine mouthwash, and application of chlorhexidine gel.<sup>9</sup>

An antiseptic in nature chlorhexidine is effectual on both aerobic and anaerobic bacteria. Among the variety of forms of chlorhexidine, the chlorhexidine mouthwash is the most widely considered form.<sup>10</sup> The new line of management of chlorhexidine group in patients of alveolar osteitis is the introduction of 0.2% Chlorhexidine bio-adhesive gel. The method of application of this gel is such that it could be placed within the alveolar socket making it possible to have a more direct action on the alveolus. This provides more reliable and direction action on socket as compared to chlorhexidine mouthwash.<sup>11</sup>

Alveolar osteitis is a common and early complication after mandibular third molar extraction. However, it causes severe pain with disturbance in social life, sleep and work. Many treatments are introduced to treat alveolar osteitis. Here in this study we have used chlorhexidine 0.2% gel to decrease the incidence of alveolar osteitis and its sequelae.

## MATERIAL & METHODS

This randomized control trial with non-probability purposive sampling contains 80 patients as follows:

**Group A:** Controlled Group = 40 Patients.

**Group B:** Chlorhexidine gel used after surgical extraction = 40 Patients.

### Inclusion Criteria

- Patients with either gender having age range of 18 to 35 years requiring extraction of surgical extraction of mandibular third molar.

### Exclusion Criteria

- Patients not willing to participate in study
- Smoker Patient
- Patient on oral contraceptives
- Patient with known allergy to chlorhexidine
- Mentally retarded patients

### Data Collection Procedure

Data were collected from OPD patients of Oral

& Maxillofacial Surgery Department, Liaquat University of Medical & Health Sciences Jamshoro/Hyderabad, who met inclusion criteria. Informed consent was taken from the patient by researcher. A complete history of the patient with name, age, gender, presenting complaint, and clinical findings like presence or absence of swelling, pericoronitis, impaction pattern according to winter's classification were recorded.

After diagnosis of the type of impaction, the patient prepared for the extraction of tooth by surgical technique. After rinsing the socket with 0.9% normal saline (Searle Ltd. Pakistan) and gentle curettage if required, a single dose of 0.2% bio-adhesive gel [Clinica gel; platinum pharm. (PVT) Ltd] was introduced in group B, while the control group A was left alone. Postoperative complications like pain [using VAS from zero (no pain) to 10 (worst pain imaginable)], and dry socket were recorded in the proforma. Each patient was called for follow-up on the 3<sup>rd</sup>, 7<sup>th</sup> and 15<sup>th</sup> days.

## RESULTS

The results showed that in Group A there were 21 male and 19 female patients while in Group B there were 18 male and 45 female patients. The frequency distributions of both groups according to gender are presented in Table-I.

The mean age of study subjects in Group A (Control Group) was  $24.47 \pm 5.23$  SD years while mean age of study subjects in Group B (Chlorhexidine Gel Group) was  $23.80 \pm 4.68$  SD years. The age was further stratified in two groups. Frequency and percentage of age groups are presented in Figure-1.

Most common angulations were Horizontal in group A and group B (40% and 32.4%) respectively. The detailed frequency distribution of angulations type is shown in Table-II.

In our study pain was observed in 24(60%) study subjects on 3<sup>rd</sup> day, 11(27.5%) study subjects on 7<sup>th</sup> day and 4(10%) study subjects on 15<sup>th</sup> day in group A, while in group B, pain was present in 15(37.5%) study subjects on 3<sup>rd</sup> day, 5(12.5%)

study subjects on 7<sup>th</sup> day and 0(0%) study subjects on 15<sup>th</sup> day. The detailed frequency distribution of pain in group A and group B is presented in Table-III.

Swelling was present in 21 (52.5%) study subjects on 3<sup>rd</sup> day, 12(30%) study subjects on 7<sup>th</sup> day and 3(7.5%) study subjects on 15<sup>th</sup> day in group A, while in group B, swelling was present in 9(22.5%) study subjects on 3<sup>rd</sup> day, 5(12.5%) study subjects on 7<sup>th</sup> day and 0(0%) study subjects on 15<sup>th</sup> day. The detailed frequency distribution of swelling in group A and group B is presented in Table-IV

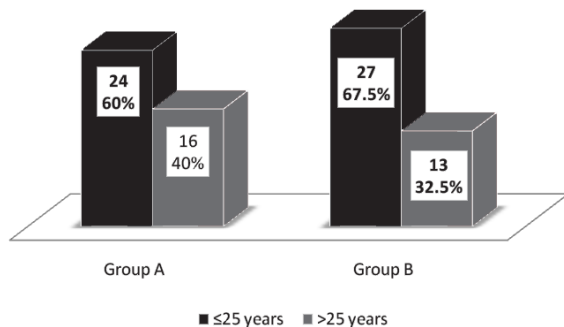
Dry socket was present in 19(47.5%) study subjects on 3<sup>rd</sup> day, 9(22.5%) study subjects on 7<sup>th</sup> day and 0(0%) study subjects on 15<sup>th</sup> day in group A, while in group B, dry socket was present in 4(10%) study subjects on 3<sup>rd</sup> day, 3(7.5%) study subjects on 7<sup>th</sup> day and 0(0%) study subjects on 15<sup>th</sup> day. The detailed frequency distribution of dry socket in group A and group B is presented in Table-V.

The results showed that there was significant association of two study group with pain on 3<sup>rd</sup> day (p=0.044), swelling on 3<sup>rd</sup> day (p=0.006) and dry socket on 3<sup>rd</sup> day (p=0.000).

	Group A n(%)	Group B n(%)
Male	21(52.5)	18(45)
Female	19(47.5)	22(55)
Total	40	40

**Table-I. Frequency distribution of gender. (n=80)**

**Group-A: Control**



**Figure-1. Frequency and percentage of patients according to age group. (n=80).**

**Group-B: 0.2% Chlorohexidine Gel**

	Group A n(%)	Group B n(%)
Mesioangular	8(20)	10(25)
Horizontal	16(40)	12(30)
Vertical	11(27.5)	10(25)
Distoangular	5(12.5)	8(20)
Total	40	40

**Table-II. Frequency distribution of angulation type. (n=80)**

Pain		Study Group		Total	P- Value
		Group A	Group B		
3 <sup>rd</sup> Day	Present (n=39)	24	15	39	0.044*
	Absent (n=41)	16	25	41	
7 <sup>th</sup> Day	Present (n=16)	11	5	16	0.094**
	Absent (n=64)	29	35	64	
15 <sup>th</sup> day	Present (n=4)	4	0	4	0.116**
	Absent (n=76)	36	40	76	

**Table-III. Frequency and association of study group according to pain on 3<sup>rd</sup>, 7<sup>th</sup> and 15<sup>th</sup> day. (n=80)**

Swelling		Study Group		Total	P-Value
		Group A	Group B		
3 <sup>rd</sup> Day	Present (n=30)	21	9	30	0.006*
	Absent (n=50)	19	31	50	
7 <sup>th</sup> Day	Present (n=17)	12	5	17	0.056**
	Absent (n=63)	28	35	63	
15 <sup>th</sup> day	Present (n=3)	3	0	3	0.241**
	Absent (n=77)	37	40	77	

**Table-IV. Frequency and association of study group. According to swelling on 3<sup>rd</sup>, 7<sup>th</sup> and 15<sup>th</sup> day. (n=80)**

Dry Socket		Study Group		Total	P-Value
		Group A	Group B		
3 <sup>rd</sup> Day	Present (n=23)	19	4	23	0.000*
	Absent (n=57)	21	36	57	
7 <sup>th</sup> Day	Present (n=12)	9	3	12	0.060**
	Absent (n=68)	31	37	68	
15 <sup>th</sup> day	Present (n=0)	0	0	0	N/A
	Absent (n=80)	40	40	80	

**Table-V. Frequency and association of study group according to dry socket on 3<sup>rd</sup>, 7<sup>th</sup> and 15<sup>th</sup> day. (n=80)**

**DISCUSSION**

The condition that seems quite common is the failure of third molars to erupt within time. The surgery of these impacted teeth is the consistently carried out procedure.<sup>12,13</sup>

In our study, predominance of male in group A and female in group B was noticed. A study carried out by Ayaz in 2012 shows most of the patients as males (64.2%).<sup>14</sup> Another research conducted in united states showed males in majority 57%.<sup>15</sup> On the other hand studies carried out in Libya<sup>16</sup> and Nigeria<sup>17</sup> reported a predominance of the female gender.

Our study showed approximately 60% of the study population in the third decade. This show a relationship with studies conducted by Khan A<sup>18</sup> and Ahmed A<sup>16</sup> where they have found mean age as 26.4 years.

In our study, the distribution of the angulations was such that mesioangular pattern was found in 20% patients, horizontal in 40% patients, vertical in 27.5% patients and distoangular angulations in 12.5% of the study participants in group A. In group B, the distribution of the angulations was such that mesioangular was found in 27% patients, horizontal in 32.4% patients, vertical in 24.3% patients and distoangular angulations in

16.3% of the study participants.

The pattern of impactions that resembles our data includes the study conducted by Ayaz A where he has documented mesioangular impaction in majority and distoangular pattern as least occurring.<sup>14</sup> Mesioangular pattern as abundant in number was also seen by Jaffar et al<sup>19</sup> with 52.3%, he also found distoangular pattern in only 9.1 % cases. Various national and international researches conducted in diggerent parts of world resembles our data in large.<sup>17,18,20,21</sup> In contrast to our findings, few studies have also found vertical impaction as mostly occurring.<sup>8,23</sup> A study on Jordanian sample showed 61% patients with vertical pattern, that is disagreement with our data.<sup>22</sup>

In our study, the frequency of swelling was 52.5% on 3<sup>rd</sup> post-op day, 30.0% on the 7<sup>th</sup> post-op day and 7.5% on the 15<sup>th</sup> post-op day in group A. The frequency of swelling was 22.5% on 3<sup>rd</sup> post-op day, 12.5% on the 7<sup>th</sup> post-op day and 0.0% on the 15<sup>th</sup> post-op day in group B. Study documented by Coello Gomez A<sup>1</sup> says that there is no statistically significant difference in both groups in terms of swelling.

In our study, the frequency of pain in the study participants was 60.0% on 3<sup>rd</sup> post-op day, 27.5% on the 7<sup>th</sup> post-op day and 10.0% on the 15<sup>th</sup> post-op day in group A. The frequency of pain in the study participants was 37.5% on 3<sup>rd</sup> post-op day, 12.5% on the 7<sup>th</sup> post-op day and 0.0% on the 15<sup>th</sup> post-op day in group B. Susarla SM in his study noticed that intensity of pain begins right after the effect of anesthesia diminishes following third molar surgery, which he has seen rising high at peak after 6 to 12 hours of surgery.<sup>24</sup> Ayaz A concludes in his study that on 3<sup>rd</sup> postoperative day 37.7% patients had mild pain.<sup>14</sup>

Chlorhexidine as a prophylactic antiseptic agent has shown excellent results in prevention of alveolar osteitis. In literature search, the occurrence of dry socket ranges in percentage of 0.3% to 26%.<sup>25</sup> Various studies showed diminished rate of occurrence dry socket by using chlorhexidine gel in third molar sockets<sup>14,18,19</sup> which resembles our

data. The study published by Khan MA<sup>26</sup> showed 24 patients reporting with dry socket out of 62 after surgical extraction. Daly B<sup>27</sup> in 2012 stated that 42% cases were prevented from alveolar osteitis by the application of chlorhexidine gel.

## CONCLUSION

Within the limitation of our study it was concluded that use of bio-adhesive gel containing 0.2% chlorhexidine that is applied in post extraction sockets decreases the happening of alveolar osteitis.

## Conflict of Interest

There is no conflict of study and the cost of chlorhexidine gel was managed by patient himself.



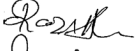
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3	Raza Ali	Manuscript designing.	
4	Salman Shams	Resultls & Proof reading.	