



# MANDIBULAR IMPACTED THIRD MOLAR; COMPARISON OF TRISMUS BY GIVING TWO DOSAGES OF DEXAMETHASONE AFTER SURGICAL EXTRACTION OF MANDIBULAR IMPACTED THIRD MOLAR.

Sohail Fareed<sup>1</sup>, Noor ul Ain Arshad<sup>2</sup>, Zahid Qayyum<sup>3</sup>

1. BDS, FCPS  
Demonstrator  
Nishtar Institute of Dentistry, Multan.
2. BDS, FCPS  
Assistant Professor  
Department of Maxillofacial Surgery  
Multan Medical and Dental College,  
Multan.
3. BDS, FCPS  
Assistant Professor  
Department of Maxillofacial Surgery  
Hayat Abad Medical Complex  
Peshawar.

**Correspondence Address:**

Dr. Sohail Fareed  
Department of Oral & Maxillofacial  
Surgery  
Nishtar Institute of Dentistry, Multan.  
dr\_sohail\_nmc@hotmail.com

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**ABSTRACT... Objectives:** To compare the difference in mean trismus by giving two doses of Dexamethasone after surgical extraction of impacted mandibular third molar. **Study Design:** Randomized controlled clinical trial. **Period:** 1<sup>st</sup> Jan 2016 to 30<sup>th</sup> June 2017. **Setting:** Out Patient Department of Oral & maxillofacial Surgery, Nishtar Institute of Dentistry Multan. **Methodology:** Data was entered on SPSS version 23 and mean  $\pm$  SD were calculated for quantitative variables like age and mouth opening in mm. Similarly frequency and percentage of qualitative variables were calculated and presented like gender and incidence of trismus. P value  $\leq$  0.05 was considered as significant. **Results:** There were 60 patients in total. Males were 31 (51.7%) while females were 29 (48.3%) (Graph-1). Mean age of the patients was  $37.25 \pm 9.04$  years ranging from a minimum of 20 to a maximum of 50 years. When students t-test was applied to compare the means of two groups, in group A the mean trismus was found to be  $25.77 \pm 3.58$  mm while in group B the mean trismus was found to be  $35.53 \pm 5.11$  mm. The t-value was found to be 8.56 and df 58. The p-value was found to be  $< 0.0001$  which was clinically significant. **Conclusion:** The dosage of 8 mg of dexamethasone was statistically more significant in the reduction of trismus as compare to 4mg (p-value =0.000). So it is recommended that Dexamethasone with dosage of 8mg should be used to control postoperative trismus after surgical extraction of mandibular impacted third molar.

**Key words:** Dexamethasone, Mandible, Mouth Opening, Pain, Third Molar, Trismus.

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## INTRODUCTION

Removal of wisdom tooth surgically under regional (local) anesthesia is under practice from a long period of time and worldwide since the dental practice has been started. This practice is continuing at lot of clinics and institutional based dental setups.<sup>1</sup> Prevalence of third molar retention was found in almost 80% of population.<sup>2</sup>

If third molar removed surgically it can cause trauma to tissues and an inflammatory response may occur<sup>3</sup>, this inflammatory response can be diagnosed by swelling, pain, and post operative dysfunction.<sup>4</sup> Another important thing that can be observed after extraction of third molar is "Trismus" mostly found in lower third molar surgery. It's a mouth opening restriction due to multiple factors like pain, edema, hematoma, and traumatic injury of tendons and muscles of jaw.<sup>5</sup>

Use of corticosteroids as adjuncts for suppression of inflammatory mediators is a useful treatment which can lessen the edema by reducing transudation of fluids.<sup>6</sup> In a previous study it was reported that by using 4mg Dexamethasone incidence of trismus is  $27.52 \pm 3.42$  mm and with 8 mg it was  $34.52 \pm 8.04$  mm when used in patients of third molar surgical patients.<sup>7</sup>

Many studies have been conducted on different doses of steroids using I/m and I/v or orally. It was reported that oral route is effective and more efficient and easy to administered.<sup>1</sup> In concept of dexamethasone use very few studies have been conducted to report their use in trismus.<sup>7</sup>

Use of dexamethasone in third molar surgery patients a markable reduction was observed in symptoms of illness and mouth opening.<sup>8</sup> Other

symptoms like pain and swelling also reduced during 1<sup>st</sup> week and efficiency in daily activities and sleep also increased.

## METHODOLOGY

This randomized controlled clinical trial was conducted from 1<sup>st</sup> Jan 2016 to 30<sup>th</sup> June 2017 in Out Patient Department of Oral & maxillofacial Surgery, Nishtar Institute of Dentistry Multan. Approval of the ethical committee of Nishtar Institute of Dentistry Multan was taken. Fully informed consent of the patients was taken. A structured proforma was used to record the patient's demographic data like patient's name, age and gender. Patients were randomly allocated into two groups by using lottery method. Group A received 4mg Dexamethasone tablet one hour before the procedure. Group B received 8mg Dexamethasone tablet one hour before the procedure. Sample size was calculated by using following figures; 95 % confidence level, 90 % power of study and non- probability, consecutive sampling technique was used. Both gender 20-50 years, mouth opening 35 mm or greater, attending the Oral and Maxillofacial Surgery requiring surgical removal of unilateral impacted mandibular third molars and patients who gave their consent to be part of study were included in the study. Non surgical removal of mandibular third molar, medically compromised patients such as diabetes mellitus (which interfere with wound healing), glaucoma and tuberculosis, already on some anti-inflammatory medication (within 2 weeks of study entry), with localized infection at the extraction site were excluded from the study.

Surgical procedure involved adequate elevation and reflection of adequate buccal mucoperiosteal flap under local anesthesia (2% Lidocaine Hydrochloride with 1:100,000 Adrenaline), buccal and distal guttering to facilitate delivery of tooth and then meticulous irrigation of the surgical site with normal saline (0.9%). Flap was repositioned and sutured. The researcher himself performed the surgical procedure. The outcome variables of both treatment modalities in term of difference in postoperative trismus at day 2 were measured by the ruler and mouth opening less than 35mm was considered as trismus.

Data was entered on SPSS version 23 and mean  $\pm$  SD were calculated for quantitative variables like age and mouth opening in mm. Similarly frequency and percentage of qualitative variables were calculated and presented like gender and incidence of trismus. P value  $\leq$  0.05 was considered as significant.

## RESULTS

There were 60 patients in total. Males were 31 (51.7%) while females were 29 (48.3%). Mean age of the patients was  $37.25 \pm 9.04$  years ranging from a minimum of 20 to a maximum of 50 years (Table-I). Mean for maximum inter-incisor distance before treatment was  $38.85 \pm 4.32$  mm ranging from a minimum of 28 to a maximum of 45. Mean for inter-incisor distance after treatment was  $30.65 \pm 6.59$ mm ranging from a minimum of 17 to a maximum of 45 (Table-I).

In treatment group A there were 30 patients in total. Males were 16 (53.3%) while females were 14 (46.7%). Mean age of the patients in this group was  $36.57 \pm 9.24$  years ranging from a minimum of 20 to a maximum of 50 years. Mean for maximum inter-incisor mouth opening before treatment was  $39.20 \pm 4.23$  mm from a minimum of 35 to a maximum of 63. While after extraction with 4 mg prophylactic dexamethasone the mean for maximum inter-incisor distance was found to be  $25.77 \pm 3.58$  mm ranging from a minimum of 17 to a maximum of 33 (Table-II).

In group B patients who received 8 mg dexamethasone before tooth extraction there were 30 patients in total. Males were 15 (50%) and females were 15 (50%) (Graph-2). Mean age was  $37.93 \pm 8.93$  years ranging from a minimum of 22 to a maximum of 50 years. Mean maximum inter-incisor distance before treatment was  $38.50 \pm 4.47$  mm ranging from a minimum of 33 to a maximum of 62mm. Mean inter-incisor distance after 8mg dexamethasone followed by tooth extraction was  $35.53 \pm 5.11$  ranging from a minimum of 22 to a maximum of 45 mm (Table-III).

When students t-test was applied to compare

the means of two groups, in group A the mean trismus was found to be  $25.77 \pm 3.58$  mm while in group B the mean trismus was found to be  $35.53 \pm 5.11$  mm. The t-value was found to be 8.56 and df 58. The p-value was found to be  $< 0.0001$  which was clinically significant. When the difference of gender was noted between the two groups, it was found that in group A there were 14 (46.6%) females and 16 (53.3%) males while in group B there were 15 (50%) males and 15 (50%) females. P-value was found out to be  $> 0.05$  (Table-IV).

When the effect of age was noted between the two groups it was noted that in group A there were 14 (46.6%) patients aged  $< 35$  years and 16 (53.3%) patients with age  $> 35$  years. In group B there were 12 (40%) patients in age group  $< 35$  while there were 18 (60%) patients in age group  $> 35$ . When chi-square test was applied to see the significant difference, p-value was found to be 0.79.

Characteristic	Percentage (n = 60) / Mean
Males	31 (51.7%)
Females	29 (48.3%)
Mean age	$37.25 \pm 9.04$

Table-I. Demographics

Characteristic	Percentage (n = 60) / Mean
Males	16 (53.3%)
Females	14 (46.7%)
Mean inter-incisor mouth opening before treatment	$38.85 \pm 4.32$ mm
Mean inter-incisor mouth opening after treatment	$30.65 \pm 6.59$ mm

Table-II. Characteristics in patients assigned to receive 4mg dexamethasone before surgery of impacted 3<sup>rd</sup> molar

Characteristic	Percentage (n = 60) / Mean
Males	15 (50%)
Females	15 (50%)
Mean maximum inter-incisor mouth opening before treatment	$38.50 \pm 4.47$ mm
Mean maximum inter-incisor mouth opening after treatment	$35.53 \pm 5.11$

Table-III. Characteristics in patients assigned to receive 8mg dexamethasone before surgery of impacted 3<sup>rd</sup> molar

Characteristics	Group A	Group B
Mean	25.77	35.53
Standard Deviation	3.58	5.11
Standard error of mean	0.6536	0.9330
T-value	8.56	
Df	58	
p-value	$< 0.0001$	

Table-IV. Comparison of two groups by application of student's t test

### DISCUSSION

Impacted wisdom tooth is common in young patients, in previous studies it was reported that in age group of 19-25 years every 12<sup>th</sup> person has mandibular third molar teeth, and older population have every 47<sup>th</sup> person with wisdom tooth to be impacted<sup>9,10</sup> In our study there were 60 patients in total. There was a slight male predominance with 51.7% males as compared to 48.3%. However the difference was just slight. There are different gender distribution among patient with impacted 3<sup>rd</sup> molar. In many of these the difference was just slight, as it was seen in our study.<sup>11</sup> Mean age of our patients was  $37.25 \pm 9.04$  years ranging from a minimum of 20 to a maximum of 50 years. 3<sup>rd</sup> decade is the most common age group to be encountered among patients with impacted 3<sup>rd</sup> molar and this was also in line with our study.<sup>12</sup> Mean for maximum inter-incisor distance was  $38.85 \pm 4.32$  mm ranging from a minimum of 33 to a maximum of 63.

In oral and maxillofacial surgery impacted third molar surgery is very common which can cause pain in post operative time and uncomfortable condition for pasoperative patients and its remedy is a challenge for surgeons. A complete range of such surgeries is being carried out at different units. Hence the surgery of third molar in particular occupies the maximum of clinical time.<sup>13</sup> Trismus compressed the nerve ending due to its straight location and produces moderate to severe pain. In our study two doses of dexamethasone was used due to its safety and ease to adminidtered.<sup>14</sup>

Clorhexidine 0.2 % mouth wash was advised to all patients in this study before administration of local anesthesia, NSAID (pain killer) paracetamol 500 mg six hourly was given in post operative

period. When students t-test was applied to compare the means of two groups, in group A the mean trismus was found to be  $25.77 \pm 3.58$  mm while in group B the mean trismus was found to be  $35.53 \pm 5.11$  mm. The t-value was found to be 8.56 and df 58. The p-value was found to be  $< 0.0001$  which was clinically significant.

A similar study was conducted by Neupert et al in 1992 and concluded that 4 mg IV dexamethasone initially but on comparison with placebo there was no significant reduction in pain and swelling was observed,  $p > 0.05$ . But on 2<sup>nd</sup> day of treatment given reduction of mouth opening observed about 9.3% when 8 mg dexamethasone was administered. After 2 days it was 11.74% increased from baseline, it was statistically significant.<sup>15</sup>

In another study conducted by Beirne et al it was reported that Methylprednisolone 125 mg intravenously reduced the pain to a significant level at 1<sup>st</sup> postoperative day and reported that corticosteroids reduced the trismus significantly when given via IV route. But he didn't observed reduction of pain with the use of dexamethasone 4mg and 8 mg.<sup>16</sup>

In another study Dionne et al used dexamethasone 4mg before twelve hours of wisdom tooth surgery in one group and other group was given placebo. In Dexamethasone group 33 patients was administered and in placebo group 28 patients. He reported that dexamethasone group reduced the PGE2 and TxB2 level but pain not reduced to a markable limit at 1<sup>st</sup> day.<sup>17</sup> Similar results were reported by Sisk et al when Flurbiprofen 50 mg was given in comparison with 125 mg intravenous Methylprednisolone.<sup>18</sup>

In a previous study different doses of dexamethasone was used IV and IM and also orally before, during and after surgery and it was reported in dexamethasone 4 mg group trismus was found up to  $27.52 \pm 3.42$  mm and in 8 mg group trismus found up to  $34.52 \pm 8.04$  mm in patients in which third molar mandibular surgery was performed.<sup>19</sup>

In a study by Schmelzeisen R et al reported that

with use of dexamethasone in perioperative oral management of mandibular third molar surgery. He reported restriction in the mouth opening 17.7%,  $P < 0.005$ . In this study pain reduction was observed with visual analog scale (VAS) and reported that dexamethasone reduced the pain in 50% of cases,  $P < 0.05$ . In this study it was also reported that with the use of corticosteroid analgesic requirement also reduced to a significant level dexamethasone is the best choice among them in perioperative period.<sup>20</sup>

Another study was conducted by Tiwana et al in 2005 and reported that administration of IV corticosteroids before third molar surgery offers a helpful effect on health-related quality of life. Our opinion is also in favor of this conclusion that reduction in pain and swelling can improve the quality of life.<sup>21</sup>

## CONCLUSION

According to this study we conclude that the dosage of 8 mg of dexamethasone was statistically more significant in the reduction of trismus as compared to 4mg ( $p$ -value =0.001). So it is recommended that Dexamethasone with dosage of 8mg should be used to control postoperative trismus after surgical extraction of mandibular impacted third molar.



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### AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Sohail Fareed	Conceived idea, Study design.	
2	Noor ul Ain Arshad	Data collection, Literature review.	
3	Zahid Qayyum	Manuscript writing, Data analysis	