

COMPARISON OF MEAN TRISMUS BY GIVING TWO DOSES OF DEXAMETHASONE AFTER SURGICAL EXTRACTION OF MANDIBULAR IMPACTED THIRD MOLAR

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ABSTRACT:

AIMS AND OBJECTIVES: Compare the difference in the mean trismus by giving two doses of Dexamethasone after surgical extraction of impacted mandibular third molar.

DURATION: February 2016 to August 2016.

SETTINGS: Out patient Maxillofacial Surgery Department, Madinah Teaching Hospital, Faisalabad.

MATERIAL & METHODS: In this Randomized Clinical Trial, 60 patients divided into 2 groups 30 in each group admitted for removal of unilateral impacted mandibular third molars were included. The age range was 20-50 years for both gender, mouth opening was ≥ 35 mm. Group A received 4mg Dexamethasone tablet one hour before the procedure. Group B received 8mg Dexamethasone tablet one hour before the procedure. After proper elevation and reflection of the appropriate muco-periosteal flap, buccal and distal guttering was done in order to facilitate the delivery of tooth. Later, flap was sutured. 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.

RESULTS: In this study, out of 60 patients, 51.7% were males while 48.3% were females. Mean age of the patients was 37.25 ± 9.04 years. In Group-A, mean for maximum inter-incisor mouth opening before treatment was 39.20 ± 4.23 mm while it was 25.77 ± 3.58 mm after treatment. In group B patients who received 8 mg dexamethasone before tooth extraction mean maximum inter-incisor distance before treatment was 38.50 ± 4.47 mm. Mean inter-incisor distance after 8mg dexamethasone followed by tooth extraction was 35.53 ± 5.11 , p-value was found to be < 0.0001 which was clinically significant.

CONCLUSION: 8 mg of dexamethasone was statistically more significant in reduction of trismus as compare to 4mg.

Keywords: Mandibular Third Molar, Surgical extraction, Dexamethasone, Trismus

INTRODUCTION:

Extraction of the 3rd molar teeth after local anesthetic is commonly done in many institutions. The prevalence of retained third molars in the adult population is 80%. Extraction of the 3rd molar teeth produces tissue trauma resulting in an inflammatory reaction. This inflammatory process involves pain, swelling and dysfunction during the post-operative period^[1]. The limitation of the opening of the mouth after surgical removal of lower 3rd molar tooth is called trismus and it occurs due to pain, swelling, edema of the tissues with involvement of the muscles and tendons^[2].

Previous study shows that, 4 mg Dexamethasone used in treatment of trismus, symptoms appear up-to $27.52 \text{ mm} \pm 3.42$ and with use of 8 mg Dexamethasone trismus occurs up to $34.52 \text{ mm} \pm 8.04$ in patients undergoing mandibular third molar surgery. Many previously studies have used steroids through various routes including intramuscular.

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Oral route is much effective and convenient to administer; besides, it ensures rapid and almost complete absorption. Despite the frequent clinical use of Dexamethasone, very few studies compare the use of different dosage^[3].

In the immediate post-operative time of 3rd molar tooth extraction physical quality of life is disturbed significantly.

Limited mouth opening, pain, swelling especially during first postoperative week results in considerable difficulty in eating, speech, appearance, sleep and other daily activities^[4].

The rationale of the study was to compare the efficacy of 4mg and 8mg of oral dexamethasone in terms of reduction in trismus in the post-operative period of extraction of 3rd molar tooth of mandible and to suggest the surgeon for better option regarding the dose of Dexamethasone.

METHODOLOGY:

In this study, we calculated sample size of 60 patients (Divided into 2 groups, 30 in each). The calculated sample size is 30 cases in each group, with 95% confidence level and 90% power of study taking magnitude (mean \pm S.D) of trismus i.e. 27.52 ± 3.42 mm with 4mg and 34.52 ± 8.04 mm with 8mg dose of Dexamethasone in patients undergoing third molar surgery. By the above stated prerequisite the sample size required is 34. But considering the lack to follow up we included 60 patients i.e. 30 in each group.

All cases requiring surgical removal of unilateral impacted mandibular third molars were included. Their age range was 20-50 years of both gender, mouth opening were ≥ 35 mm.

We excluded all the patients with other causes of removal of mandibular 3rd molar tooth, medically compromised patients, such as diabetes mellitus(which interfere with wound healing), glaucoma and tuberculosis, already on some anti-inflammatory medication in past 14 days and those with localized infection at the extraction site.

The randomization of the groups was computed based i.e. A & B. Group A received 4mg Dexamethasone tablet one hour before the procedure. Group B received 8mg Dexamethasone tablet one hour before the procedure. After proper elevation and reflection of the appropriate muco-periosteal flap, buccal and distal guttering was done in order to facilitate the delivery of tooth. Later on , flap was sutured. 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 analyzed in SPSS, Version 23 and study results, i.e. mean \pm SD for quantitative variable i.e. trismus (mm) and age of the patients were calculated.

Frequencies and percentages were computed for gender of the participants. Student t test was used to compare the mean trismus between the two treatment modalities, $P < 0.05$ was considered as significant.

RESULTS:

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 ± 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 ± 4.23 mm from a minimum of 35mm to a maximum of 63mm. While after extraction with 4 mg prophylactic dexamethasone the mean for maximum inter-incisor distance was found to be 25.77 ± 3.58 mm ranging from a minimum of 17mm to a maximum of 33mm. 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%). Mean age was 37.93 ± 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 ± 4.47 mm ranging from a minimum of 33mm to a maximum of 62mm. Mean inter-incisor distance after 8mg dexamethasone followed by tooth extraction

was 35.53 ± 5.11 ranging from a minimum of 22mm to a maximum of 45 mm (Table 1).

In group A the mean trismus was found to be 25.77 ± 3.58 mm while in group B the mean trismus was found to be 35.53 ± 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 (Table 2).

Table 1

Characteristic	Group-A	Group-B
Males	16 (53.3%)	15 (50%)
Females	14 (46.7%)	15 (50%)
Mean age	36.57 ± 9.24	37.93 ± 8.93
Mean maximum inter-incisor mouth opening before treatment	39.20 ± 4.23 mm	38.50 ± 4.47 mm
Mean maximum inter-incisor mouth opening after treatment	25.77 ± 3.58 mm	35.53 ± 5.11

Table 2

	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	

DISCUSSION

The impacted mandibular third molar tooth (wisdom tooth) is very usual among young adults. Previously, it has been expected that one out of every 11 mandibular third molar teeth appear in 19 to 25 years of people. In older adults, 1 in every 46 mandibular third molar teeth was reported to be impacted. In our

study there were 60 patients in total. There was a slight male predominance with 51.7% males as compared to 48.3% females. However the difference has been just slight. There are different gender distribution among patient with impacted 3rd molar. In many of these studies, the difference has been just slight, as it was seen in our study. Mean age of our patients was 37.25 ± 9.04 years ranging from a minimum of 20 to a maximum of 50 years. 3rd decade is the most common age group to be encountered among patients with impacted 3rd molar and this was also in accordance with our study. Mean for maximum inter-incisor distance was 38.85 ± 4.32 mm ranging from a minimum of 33 to a maximum of 63.

Extraction of the 3rd molar teeth after local anesthetic is commonly done in many institutions. Trismus is a straight continuation of the swelling after impaction surgery that compresses nervous structures and generate a variety of pain. Dexamethasone was chosen with 2 dosages (4mg and 8 mg) as it has already been provensafe.

In this study all the patients were advised to use a mouthwash chlorhexidine 0.2 % before local anesthesia. After the extraction, a non-steroidal anti-inflammatory drug (paracetamol 500 mg given after six hours for 4 days) were prescribed. Outcomes of both treatment modalities (both dosage) in term of decrease in postoperative trismus at day 2 were measured. When comparing doses, 8 mg dexamethasone was statistical significant in reducing the trismus (p-value = 0.000). The average of the "maximum inter-incisional" mouth opening distance was significantly higher in group B as compared to group A (p-value =0.000001). Neupert et al (1992) reported that maximum inter-incisal mouth opening improved after using 4 mg dexamethasone, but was not statistically significant was observed between steroid versus placebo groups for pain or swelling (p-value > 0.05). After one day of surgery the limit of mouth opening was reduced initially by 9.3% later by using 8 mg of dexamethasone and 2 days opening limit of the mouth increased to 11.74%, this difference was clinically and statistically significant. Similar

results were shown in study by Alcântara CEP, et al.

Beirne et al, conducted a clinical trial by using Methylprednisolone (125 mg) with 3rd molar surgery. He reported decrease in pain after 1st post-operation day. Trismus significantly improved along with the use of steroids, but was not significantly associated with reduction of pain. Pain was not reduced with 4 mg or 8 mg of dexamethasone use as well^[19]. Similar results were seen by Agostinho CN, et al.^[10], Bortoluzzi MC, et al^[11], Mojsa IM, et al and Boonsiriseth K, et al^[13] but pain^[12] and swelling was shown to be reduced by Klongnoi B, et al^[14]. Fernandes IA, et al concluded from his meta-analysis that steroids from any feasible route is effective in reducing pain and edema when compared to non-steroidal treatment^[15-20].

Previous study shows that, with the use of 4 mg dexamethasone trismus occurs up to 27.52 ± 3.42 mm and with use of 8 mg dexamethasone trismus occurs up to 34.52 ± 8.04 mm in patients undergoing mandibular third molar surgery. In few studies reported previously, single and different doses of steroids had been used intramuscularly, intravenously or orally before the operation, peri-operatively and after the operation^[21].

More over according to Schmelzeisen R et al the use of steroid orally during the operation once and after the operation of removal of 3rd molar tooth, improved swelling, jaw opening, and pain. Just after operation on day 1, dissimilarity in swelling was 54.3% ($p < 0.001$) measured by tape, 46% ($p < 0.001$) deliberated using a gauge in 1st molar region and 29% ($p > 0.05$) by ultrasonic evaluation of cheek diameter. Restriction opening of mouth was reported to be improved (17.7%) ($P < 0.005$). Improvement of pain was measured by visual analog scale (VAS) showed a significant improvement (50%) ($P < 0.05$). Need of analgesic after the operation also showed significant improvement (37%) ($P < 0.05$) with subsequent steroid use. 76% patients favored the use of steroid^[22].

In a study done few years back, Tiwana et al also preferred use of steroid along with 3rd molar surgery had helpful effect decreasing morbidity, decreasing length of hospital stay,

length of treatment^[23].

In a meta-analysis, 22 of 29 studies reported reduced swelling while 18 of 25 studies reported improvement in opening of the mouth. 14 studies reported the benefit of corticosteroids on all 3 sequelae, with 71.4% resulted from the use of methylprednisolone^[24].

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When Imam Ali was asked about Faith in Religion, he replied that the structure of faith is supported by four pillars endurance, conviction, justice and jihad.

Hazrat Ali (Karmulha Wajhay)