EFFECT OF DEXAMETHASONE DOSAGE ON TRISMUS AFTER SURGICAL REMOVAL OF MANDIBULAR THIRD MOLAR IMPACTION- A RANDOMIZED CLINICAL TRIALS

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ABSTRACT

Objective: *To compare incidence of trismus postoperatively in patients receiving preoperative 4mg versus 8mg intravenous dexamethasone after the surgical removal of impacted mandibular third molars.*

Materials and Methods: *Forty participants were randomly divided into two groups by lottery method. Group A received 4mg dexamethasone and group B received 8mg intravenously one hour before the procedure. Both genders with age range of 18-40 years, having mouth opening more than 35 mm and impacted mandibular third molars were included in the study. Cases having contra-indications to the use of steroids like diabetes mellitus, glaucoma, and tuberculosis were excluded. Mouth opening was measured in millimetres preoperatively and post-operatively after 2 days. Descriptive statistics were calculated. Independent t test and Chi-square test were used to compare mouth opening and trismus between the two groups respectively.*

Results: *The mean age was 29.62±6.704 years. The males were 21(52.5%) and females were 19(47.5%). The mean post-operative mouth opening at day 2 was more in 8mg (35.95±2.704) than 4mg dexamethasone group(31.30±5.292) and results were statistically significant (P=.001). Similarly the comparison of trismus in 4mg versus 8 mg dexamethasone shows that trismus was less in 8mg (25%) than 4mg dexamethasone group (60%) and results were statistically significant (P=0.025).*

Conclusion: *The administration of 8 mg dexamethasone was more effective than 4mg to reduce the degree of trismus.*

Keywords: *Third molar, impacted third molar, trismus, dexamethasone*

INTRODUCTION

Third molar is last tooth to erupt in oral cavity.[1] The jaws growth in most of the individuals is completed when the time of third molar eruption arrive. Due to this reason it commonly remains impacted partially or completely.[2] As the third molar have no major role in occlusion and chewing, it is usually recommended to remove it. Though the removal of asymptomatic impacted third molar is controversial, there is no reason to retain a symptomatic impacted third molar.[3] Impacted third molar commonly associated with symptoms like pericoronitis, periodontitis, cystic lesion, neoplasm and pathologic root resorption can cause unfavourable effects on neighboring tooth.[4, 5]

Under local anesthesia removal of mandibular impacted third molar is much more challenging for surgeon.[6] About 80% of individuals have mandibular third impaction.[7] The surgical removal of third molar is usually associated with complications like trismus, pain, swelling , dysasthesia, severe infection, bone fracture, and dry socket.[8, 9] Analgesics, antibiotics, steroids and enzymes like serratiopeptidase are usually prescribed to minimize these post-surgical complications.[10]

The use of dexamethasone as intramuscular,

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intravenous or sub mucosal as preoperative or postoperative seems to be effective to prevent postoperative trismsus.[11] A study conducted by Laureano Filho et al.[5] reported 8mg dexamethasone relief trismus statistically more than that 4mg dexamethasone in patients undergoing mandibular third molar surgery. However another study reported that there was no statistically significant difference in trismus after the use 4mg versus 12 mg dexamethasone in patients undergoing third molar disimpaction.[12]

Despite the frequently clinical use of dexamethasone, very few studies compare the use of different dosage. In pursuit of improved immediate postoperative patient quality of life after third molar surgery, there is need to conduct clinical trials. This study was conducted to evaluate the comparative postsurgical effect of two different doses of intravenous dexamethasone to decrease the trismus after the surgical extraction of mandibular impacted third molar surgery in our setting.

The objective this trial was to compare incidence of trismus postoperatively in patients receiving preoperative 4mg versus 8mg intravenous dexamethasone after the surgical removal of impacted mandibular third molar.

MATERIALS AND METHODS

This randomized clinical trial was conducted at Outpatient department of oral and maxillofacial surgery of Saidu College of dentistry, Swat from august 2019 to December 2020. Ethical approval was obtained from hospital ethical review committee. After detailed explanation about the purpose and benefits of the study, verbal informed consent was obtained from all participants.

Non probability, consecutive sampling technique was used. The sample size was 42 (21 in each group) calculated by WHO software at 5% level of significance and 80% power of test using mean mouth opening of 34.52± 8.04mm in 8mg of dexamethasone and 27.52±3.42mm in 4mg of dexamethasone from previous study.[5]

Both genders with age range of 18-40 years, having mouth opening more than 35 mm and impacted mandibular third molars were included in the study. Cases having contra-indications to the use of steroids like diabetes mellitus, glaucoma, and tuberculosis were excluded. Those who already had taken anti-inflammatory drugs within last 15 days were also excluded.

After detailed history and relevant clinical examination, demographics like age and gender was recorded. Participants meeting inclusion criteria were randomly divided into two groups by using lottery method. Group A received 4mg and group B received 8 mg dexamethasone intravenously 60 minutes before the procedure. All the participants were asked to rinse their mouth with chlorhexidine 0.2 % mouthwash prior to local anaesthesia as well in postoperative period. All impacted third molars were surgically removed by consultants (oral and maxillofacial surgeon with FCPS or equivalent qualification) under local anaesthesia. Each patient was prescribed analgesics (ibuprofen 400 mg 8 hourly), penicillin (Amoxillicin 500mg 8 hourly) and metronidazole (400mg 8 hourly). Mouth opening (MO) was recorded pre-operatively and at day 2 in both groups. Trismus was recorded as positive if mouth opening was less than 35mm and measured by ruler.

All data analysis was performed in SPSS 22. Mean and SD was computed for continuous data like age, pre- and post-operative MO. Frequencies and percentages were calculated for categorical variables like gender and trismus. Comparison of mouth opening between the two groups was done post-operatively at day 2 using independent samples t test. Presence of trismus was compared between the two groups using Chi-square test. For all analysis $P \leq 0.05$ was set as a level of significance.

RESULTS

Of total 42 selected participants, 2 cases were lost to follow up so finally 40(20 in each group) patients were analyzed. The mean age was 29.62±6.704 years with range from 18 to 40 years.

The males were 21(52.5%) and females were 19(47.5%). The common age group was 18-25 (n=14, 35%) followed by 36-40 years (n=12, 30%). Post operative trismus at day 2 was present in 17(42.5%) cases. The details are given in table 1.

The mean pre-operative mouth opening was 45.55±4.58 in 4mg dexamethasone and was 46.25±5.056 in 8mg group. The difference was not statistically significant (P=0.649). The mean post-operative mouth opening at day 2 was more in 8mg (35.95±2.704) than 4mg dexamethasone

group(31.30±5.292) and results were statistically significant (P=.001). (Table 2)

Similarly the comparison of trismus in 4mg versus 8 mg dexamethasone shows that trismus was less in 8mg (25%) than 4mg dexamethasone group (60%) and results were statistically significant (P=0.025). The detailed statistics are given in table 3.

DISCUSSION

This study was aimed to compare the incidence of trismus postoperatively in patients receiving preoperative 4mg versus 8mg intravenous dexamethasone during surgical removal of impacted mandibular third molar. Our main findings were; the mean post-operative mouth opening was more

Table 1: Frequency of gender, age group and post operative trismus at day 2

		Frequency	Percent
Gender	Male	21	52.5
	Female	19	47.5
Age Group	18-25	14	35.0
	26-30	8	20.0
	31-35	6	15.0
	36-40	12	30.0
Trismus	Yes	17	42.5
	No	23	57.5

Table 2: Comparison of mouth at preoperative and post-operative in two dosage groups of dexamethasone

	Dexamethasone	Mean ± SD	95% CI	P-Value
Pre-operative MO	4mg	45.55±4.58	-3.78, 2.38	.649
	8mg	46.25±5.056		
Post Operative MO	4mg	31.30±5.292	-7.34, -1.95	.001
	8mg	35.95±2.704		

*independent t test

Table 3: Comparison of trismus in 4mg versus 8 mg dexamethasone

Dexamethasone	Trimus				P-Value*
	Yes		No		
	N	%	n	%	
4mg	12	60.0	8	40.0	0.025
8mg	5	25.0	15	75.0	

Chi-square test

in 8mg than 4mg dexamethasone group statistically. The incidence of trismus (<35 mm MO) was higher in 4mg dexamethasone group than 8mg (P=0.025).

We conducted randomized clinical trials on dexamethasone though other steroid like methylprednisolone can be also used to control swelling and trismus in cases undergoing impaction third molars extraction. A previous met analysis showed that dexamethasone is more effective than other steroids in patients that need surgical removal of impacted third molars.[13]

In the current study we used consecutive sampling and males were more than females. This may be due to the reason that males are more outdoor working and financially independent. So have more chances to seek dental treatment especially surgeries.

In this study the mean age was 29.62±6.704 years. The age range was form 18 to 40 years. Third

molar usually erupts upto 18 years. After that they are usually considered impacted. So in this study lower limit of age was 18 years. Upper limit was 40 years. The reason may be that third molar is usually removed in symptomatic conditions like pericoronitis etc. Most of these appear before age 40.

Our results showed that there was no statistically significant difference in MO preoperatively between the two groups (4mg vs 8mg). This shows the mouth opening in both groups was similar.

Our findings show that higher doses of steroids (dexamethasone) is more effective in reducing trismus after surgical removal of mandibular third molar. There is another Brazilian study conducted on Brazilian population to determine the efficacy of 2 different doses of dexamethasone to control complication after third molar extractions. Their results showed that 8mg Dexamethasone is more effective than 4mg in reducing trismus.[14] A randomized clinical trial compared 8mg and 4mg dexamethasone preoperatively one hour before surgical removal of third impaction and reported 8mg is more efficient in prevention of trismus than 4mg dexamethasone.[5] These results are similar to our study.

Ustun et al[15] found no significant different between 1.5mg/kg and 3.0mg/kg of steroid (methylprednisonlone) on trismus after third molar surgery. These differences in results attributed that they used different drug than our study. However genetics of the participants and complexity of impacted third molar can be other factors. Another study also reported that there was no statistically significant diference in trismus after the use 4mg versus 12 mg dexamethasone in patients undergoing third disimpaction.[12]

This randomized clinical trial has some limitations like the frequency of trismus can be variable due to difficulty index of the impacted mandibular third molar. In case of more bone resection and soft tissue manipulation for difficult impaction higher degree of limited mouth opening is expected. So more trials are needed to explore this area further.

CONCLUSIONS

Within the limitations of this study it can be concluded that the administration of 8 mg dexamethasone was more effective than 4mg of the dexamethasone to reduce the degree of trismus.

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