



## COMPARISON OF THERAPEUTIC EFFECTS OF 8 MG DEXAMETHASONE INTRAMUSCULAR ADMINISTERED PRE-OPERATIVELY VS. POST OPERATIVELY AFTER THE SURGICAL EXTRACTION OF IMPACTED MANDIBULAR THIRD MOLARS

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### ABSTRACT:

**Background:** Third molar eruption and continuous positional changes after eruption can be related not only with race but also with nature of the diet, the intensity of the use of the masticatory apparatus and possibly due to genetic background. Hence, the present study was undertaken for comparing the Therapeutic Effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars.

**Materials & methods:** This study was conducted on 50 subjects reporting to the OPD at Dental Max Care (Private Dental Clinic). Cases were taken at random to be allocated in any of the following groups: Group A: Administration of Pre-operatively Intramuscular 8 mg Dexamethasone. Group B: Administration of Post-operatively Intramuscular 8 mg Dexamethasone. The patients were given the routine post-operative home care instruction. Antibiotic coverage was given: capsule amoxicillin 500mg orally 3 times daily for 3 days. The sutures will be removed at 7th day follow up. Patients were assessed postoperatively and data were analysed.

**Results:** Mean swelling was significantly higher among patients of group B at postoperative 1<sup>st</sup> day and at postoperative 3<sup>rd</sup> day. However; at postoperative 7<sup>th</sup> day, no significant difference was observed in terms of swelling in between both the study groups.

**Conclusion:** Superior post-operative therapeutic effects are achieved by pre-operative administration of 8 mg intramuscular injection of dexamethasone as compared to post-surgical administration in impacted third molar surgeries.

**Key words:** Dexamethasone, Impacted, Molar

### INTRODUCTION

Third molar eruption and continuous positional changes after eruption can be related not only with race but also with nature of the diet, the intensity of the use of the masticatory apparatus and possibly due to genetic background.<sup>1-3</sup>

The ideal moment to determine whether or not to remove third molars is also under debate, since impaction prediction has not been scientifically proven. Moreover, it is a daunting task to predict

this biological condition with any degree of reliability. Systematic reviews report that there is no evidence to support or refute prophylactic removal of asymptomatic impacted third molars, even in adults. These systematic reviews contraindicate the prophylactic removal of third molars in order to prevent late lower anterior crowding. Glucocorticoids act at every step in the inflammatory process to decrease circulating lymphocytes, inhibit capillary dilatation and fibroblast proliferation, and alter prostaglandins and leukotrienes synthesis. As the suppression of these factors exerts a profound effect on tissue inflammation, corticosteroids are used in surgical procedures to reduce the acute inflammatory conditions that occur postoperatively. Acute inflammation induced by tissue damage plays a major role in development of postoperative pain. Moreover, locally applied glucocorticoids have a direct inhibitory effect on signal transmission in nociceptive C-fibers and ectopic neuroma discharge in injured nerves.<sup>4-6</sup>

The postoperative experience of pain depends on the degree of surgical trauma suffered, requirement for bone tissue removal, and the extension of the periosteum. The role of corticosteroids in preventing postoperative pain is controversial. Corticosteroids are employed particularly after surgery to limit the accumulation of inflammatory mediators and reduce fluid transudation and edema. Dexamethasone has a wide variety of uses in the medical field. As a treatment, dexamethasone has been useful in the treatment of acute exacerbations of multiple sclerosis, allergies, cerebral edema, inflammation, and shock.<sup>6-8</sup> Hence, the present study was undertaken for comparing the Therapeutic Effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars.

## **MATERIALS & METHODS**

The present study was undertaken for comparing the Therapeutic Effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars.

This study was conducted on 50 subjects reporting to the OPD at Dental Max Care (Private Dental Clinic). Cases were taken at random to be allocated in any of the following groups:

Group A: Administration of Pre-operatively Intramuscular 8 mg Dexamethasone. Group B: Administration of Post-operatively Intramuscular 8 mg Dexamethasone.

The patients were given the routine post-operative home care instruction. Antibiotic coverage was given: capsule amoxicillin 500mg orally 3 times daily for 3 days. The sutures will be removed at 7th day follow up. Patients were assessed postoperatively and data were analysed. Data was analysed by using SPSS 21.0. Quantitative variables were presented as means and standard deviations. Qualitative variables were presented as frequencies and percentages. The results of the two groups were compared using t-test and chi-square test.

## **RESULTS**

Mean age of the patients of group A and group B was 25.1 years and 26.2 years respectively. Both the groups were comparable in terms of age-wise distribution of patients. Among the patients of group A, mean swelling during preoperative period, postoperative 1<sup>st</sup> day, postoperative 3<sup>rd</sup> day and postoperative 7<sup>th</sup> was 12.1 cm, 11.8 cm, 13.5 cm and 12.4 cm respectively. Among the patients of group B, mean swelling during preoperative period, postoperative 1<sup>st</sup> day, postoperative 3<sup>rd</sup> day and postoperative 7<sup>th</sup> day was 12.6 cm, 14.3 cm, 15.1 cm and 12.3 cm respectively. Mean swelling was significantly higher among patients of group B at postoperative 1<sup>st</sup> day and at postoperative 3<sup>rd</sup> day. However; at postoperative 7<sup>th</sup> day, no significant difference was observed in terms of swelling in between both the study groups.

**Table 1:** Descriptive results of age (years)

Age (years)	Group A	Group B
Mean	25.1	26.2
SD	4.1	4.8
t-statistics	-385	
p- value	0.45	

**Table 2:** Descriptive statistics for swelling (cm)

Swelling	Group A	Group B	p- value
Pre-operative swelling (cm)	12.1	12.6	0.12
Post-operative 1 <sup>st</sup> day swelling (cm)	11.8	14.3	0.00*
Post-operative 3 <sup>rd</sup> day swelling (cm)	13.5	15.1	0.00*
Post-operative 7 <sup>th</sup> day swelling (cm)	12.4	12.3	0.26

\*: Significant

## DISCUSSION

The present study was undertaken for comparing the Therapeutic Effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars. Mean age of the patients of group A and group B was 25.1 years and 26.2 years respectively. Both the groups were comparable in terms of age-wise distribution of patients. Among the patients of group A, mean swelling during preoperative period, postoperative 1<sup>st</sup> day, postoperative 3<sup>rd</sup> day and postoperative 7 was 12.1 cm, 11.8 cm, 13.5 cm and 12.4 cm respectively. Among the patients of group B, mean swelling during preoperative period, postoperative 1<sup>st</sup> day, postoperative 3<sup>rd</sup> day and postoperative 7<sup>th</sup> day was 12.6 cm, 14.3 cm, 15.1 cm and 12.3 cm respectively. Gaspar BDS et al established the effects of pre- and postoperative administration of dexamethasone for upper and lower third molar surgery. A randomized, triple-blind clinical trial with a split-mouth design was conducted with a sample composed of 30 patients. Participants were divided in two groups: Group A (one dose of dexamethasone 12 hours after surgery) and Group B (one dose of placebo 12 hours after surgery). All patients received single dose of dexamethasone (8mg) and nimesulide (100mg) per oral route, one hour before surgery. The outcome variables were: pain, total number of analgesics taken, interval between analgesics, swelling and trismus. Those parameters were evaluated in different timepoints. Quantitative data were subjected to the Kolmogorov-Smirnov normality test and compared by means of the paired t-test and ANOVA. Group A showed less swelling and trismus 48h after surgery (p=0.167), but no statistical significant different were found. On assessment of postoperative pain 16 hours after surgery, the scores were higher in Group B (placebo) (p=0.031).<sup>10</sup> In the present study, Mean swelling was significantly higher among patients of group B at postoperative 1<sup>st</sup> day and at postoperative 3<sup>rd</sup> day. However; at postoperative 7<sup>th</sup> day, no significant difference was observed in terms of swelling in between both the study groups. Sreesh S et al compared the postoperative pain, edema and trismus following third molar surgery while using preoperative intravenous and submucosal routes of dexamethasone, in terms of pain, facial swelling, and trismus. This study consisted of 64 patients presented with mesioangular impacted mandibular third molar for surgical removal. Preoperative measurements of edema, trismus were analyzed. Postoperative pain was estimated using visual analogue scale. Edema was assessed by the extra oral facial measurements. Trismus was measured by recording the interincisal opening in millimeters. Dexamethasone was administered intravenously or submucosally according to the choice of operating surgeon and were divided into 2 groups. Changes in parameters was analysed using t test and Mann– Whitney U test. Here, submucosal group were reported with increased pain on the second postoperative day. On seventh postoperative day mean value turns to  $0.7 \pm 1$  for submucosal and  $0.6 \pm$

1.2 for intravenous group. On overall observation, intravenous group expressed statistically significant ( $P < 0.01$ ) reduction in pain compared to the submucosal group during immediate and second postoperative days. Analyzing the previous studies, and from the experience of the present one, it could be reasonably found out that administration of submucosal dexamethasone is beneficial for overall patient compliance.<sup>11</sup> Hiriyanna NM et al investigated objective facial measurements, mouth opening and compared them with subjective scores on a visual analogue scale and quality of life (QOL) recovery questionnaire. Patients were randomly divided into two groups and received 8 mg DX as either submucosal or intravenous injection 5 min after administration of local anaesthesia. Data was collected at 2nd and 7th post-op intervals. Thirty patients were evaluated in the study. SM route behaved similarly to IV route in producing changes in facial measurements [ $P = 0.533$ ], mouth opening [ $P = 0.533$ ] and pain [VAS] scores [ $P = 0.533$ ] at early and late intervals. Questionnaire subscale scores were not significantly different between groups, but total mean score was significant [ $P = 0.050$ ] with a measure of variance 17.54 in group IV compared with 39.54 of group SM showing that subjectively, IV route brought better recovery. Submucosal route can be an effective less invasive, painless, straightforward alternative to systemic administration of corticosteroid for improving QOL recovery in mandibular third molar surgery.<sup>12</sup>

## CONCLUSION

Superior post-operative therapeutic effects are achieved by pre-operative administration of 8 mg intramuscular injection of dexamethasone as compared to post-surgical administration in impacted third molar surgeries.

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