

Original Research

Assessment of effect of dexamethasone among patients undergoing surgery for removal of impacted third molar

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ABSTRACT:

Background: The present study was conducted for assessing the effect of dexamethasone among patients undergoing surgery for removal of impacted third molar. **Materials & methods:** A total of 100 subjects scheduled to undergo surgery for impacted mandibular third molar were included. Subjects were taken at random to be allocated in any of the following groups: Group A: Administration of Pre-operatively Intramuscular 8 mg Dexamethasone and Group B: Administration of Post-operatively Intramuscular 8 mg Dexamethasone. Patients were subjected to complete history taking including medical and dental examination as per proforma. All the patients underwent surgery were impacted third molar according to their respective study groups. Visual analogue scale was used to analyse the intensity of the pain on a scale of 0 to 10 with 0 indicating no pain and 10 indicating maximum severe unbearable pain. Data was analysed by using SPSS software. **Results:** Mean postoperative mouth opening was significantly lower among patients of group B in comparison to patients of group A at postoperative 1st day and 3rd day. However, while comparing the VAS in between the two study groups at different time intervals, non-significant results were obtained. **Conclusion:** Significantly better post-operative therapeutic effects are achieved by pre-emptive administration of 8 mg intramuscular injection of dexamethasone as compared to post-surgical administration in impacted third molar surgeries.

Key words: Dexamethasone, Third molar, Impacted

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INTRODUCTION

Third molars are the most frequently impacted teeth and might fail to erupt into a normal functional position. The prevalence of impacted third molars ranges between 16.7–68.6% across various populations. Studies from the Gulf region have reported an impacted third molars rate of 32–40.5%. A recently published study from Oman found that 54.3% of young Omani adults between 19–26 years old have at least one impacted third molar.^{1,2}

Extraction of third molars is one of the most common procedures performed by oral surgeons. Generally, these surgeries do not encounter difficulties but at times can result in complications; a complication rate of 4.6–30.9% following the extraction of third molars is reported in the literature. Complications may occur intraoperatively or develop during the postoperative period.^{3,4}

Dexamethasone has a wide variety of uses in the medical field. As a treatment, dexamethasone has

been useful in treating acute exacerbations of multiple sclerosis, allergies, cerebral edema, inflammation, and shock. Patients with conditions such as asthma, atopic and contact dermatitis, and drug hypersensitivity reactions have benefited from dexamethasone. Dexamethasone is a potent glucocorticoid with very little, if any, mineralocorticoid activity. Dexamethasone's effect on the body occurs in a variety of ways. It works by suppressing the migration of neutrophils and decreasing lymphocyte colony proliferation. The capillary membrane becomes less permeable, as well. Lysosomal membranes have increased stability. 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.⁴⁻⁷ Hence; the present study was conducted for assessing the effect of dexamethasone among patients undergoing surgery for removal of impacted third molar.

MATERIALS & METHODS

The present study was conducted for assessing the effect of dexamethasone among patients undergoing surgery for removal of impacted third molar. A total of 100 subjects scheduled to undergo surgery for impacted mandibular third molar were included. Subjects 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.

Patients were subjected to complete history taking including medical and dental examination as per proforma. All necessary pre-operative radiographs, intra-operative and postoperative photographic records were taken and mentioned. Demographic

details and the written informed consent was entered on a Proforma and signed by patients. Under aseptic conditions patients were prepared. All the patients underwent surgery were impacted third molar according to their respective study groups. Visual analogue scale was used to analyse the intensity of the pain on a scale of 0 to 10 with 0 indicating no pain and 10 indicating maximum severe unbearable pain. Data was analysed by using SPSS software.

RESULTS

Mean age of the patients of the Group A and group B was 35.3 years and 34.7 years respectively. Majority proportion of patients of both the study groups were males. Mesio-angular type of impaction was the most common form in impaction in both the study groups. Mean postoperative mouth opening was significantly lower among patients of group B in comparison to patients of group A at postoperative 1st day and 3rd day. However; while comparing the VAS in between the two study groups at different time intervals, non-significant results were obtained.

Table 1: Distribution of patients according to angulation of impacted tooth

Angulation of impacted tooth	Group A		Group B	
	Number of patients	Percentage	Number of patients	Percentage
Disto-angular	9	18	8	16
Horizontal	6	12	8	16
Mesio-angular	26	52	24	48
Vertical	9	18	10	20
Total	50	100	50	100

Table 2: Descriptive statistics for Mouth opening (mm)

Descriptive	Group A	Group B	p- value
Pre-operative	48.3	49.2	0.11
Post-operative 1 st day	36.1	31.3	0.00*
Post-operative 3 rd day	43.5	35.2	0.00*
Post-operative 7 th day	48.5	48.9	0.58

*: Significant

Table 3: Descriptive statistics for VAS

Descriptive	Group A	Group B	p- value
Pre-operative	0	0	-
Post-operative 1 st day	4.8	4.8	0.52
Post-operative 3 rd day	2.7	3.1	0.65
Post-operative 7 th day	0.16	0.15	0.45

*: Significant

DISCUSSION

An impacted tooth can be defined as one that is prevented from erupting up to occlusal level because of malposition, physical barrier or lack of space in the arch. Impacted third molars are considered as the developmental, pathological and medical deformities characteristic of a modern civilization. For many years removing or retaining impacted third molar has been a subject of discussion in the dental literature. They are considered as "Waste Bin" in dental

practice as they are regarded as functionally nonessential.^{1,2}

The indications for removing impacted teeth can be divided into those of acute or chronic pathology. Impacted third molars are often associated with pain, infection, cyst formation, benign tumors, root resorption, bone loss, periodontal disease, and caries. The decision to surgically remove impacted third molars is often unclear. There are no absolute treatment protocols established. The dentist must

consider a variety of factors and make an informed decision with the patient.^{3,4}

By virtue of its potential anti-inflammatory effects, dexamethasone is useful in lowering pain, and is currently the most powerful anti-inflammatory drug, with a long half-life. Dexamethasone is considered safe for periods shorter than two weeks even in amounts above physiological doses. Previous studies have shown that the perioperative use of corticosteroids reduces postoperative discomfort after removal of impacted mandibular third molars.⁶⁻⁹ Hence; the present study was conducted for assessing the effect of dexamethasone among patients undergoing surgery for removal of impacted third molar.

Mean age of the patients of the Group A and group B was 35.3 years and 34.7 years respectively. Majority proportion of patients of both the study groups were males. Mesio-angular type of impaction was the most common form in impaction in both the study groups. Mean postoperative mouth opening was significantly lower among patients of group B in comparison to patients of group A at postoperative 1st day and 3rd day. Our results were in concordance with the results obtained by previous authors who also reported similar findings. In a study conducted by Graziani F et al, authors studied the effect of endo-alveolar and sub-mucosal administration of dexamethasone sodium phosphate to prevent inflammatory sequelae after surgical removal of lower third molars. Forty-three patients underwent bilateral extractions of lower third molars and were randomly assigned to receive either dexamethasone 4 mg (group A) or 10 mg (group B) as endo-alveolar powder or 10 mg as sub-mucosal injection (group C) unilaterally. A multivariate analysis revealed that treatment and osteotomy time were both significantly positively associated with the degree of postoperative trismus and edema. Other baseline classification variables (e.g., molar classification) were also predictive of the degree of change in all clinical parameters. Test sites treated (any steroid application) showed greater reductions in all clinical parameters recorded compared to control.¹⁰ In a similar study conducted by Grossi GB et al, authors evaluated the effect of submucosal administration of dexamethasone sodium phosphate on discomfort after mandibular third molar surgery. Sixty-one consecutive patients requiring surgical removal of a single mandibular impacted third molar under local anesthesia were randomly placed into 3 groups. After the onset of local anesthesia, the experimental groups received dexamethasone at 2 different doses (4 or 8 mg) as submucosal injection, and the control group received no drug. The patients' perception of the severity of symptoms was assessed with a follow-up questionnaire (PoSSe scale). On the second postoperative day, facial edema showed a statistically significant reduction in both dexamethasone 4-mg and dexamethasone 8-mg groups compared with the

control group, but no statistically significant differences were observed between the 2 dosage regimens of dexamethasone. Parenteral use of dexamethasone 4 mg, given as an intraoral injection at the time of surgery, is effective in the prevention of postoperative edema.¹¹

In the present study, however; while comparing the VAS in between the two study groups at different time intervals, non-significant results were obtained. In another previous study conducted by Laureano Filho JR et al, authors evaluated the effect of two different concentrations (4 and 8 mg) of dexamethasone to decrease the swelling and trismus after the surgical extraction of mandibular impacted third molars. This randomized clinical trial comprised thirty (30) adult patients of both genders with no local or systemic problems, with bilateral impacted lower third molars in similar position, where surgical extraction had been indicated. They were given 4 mg and 8 mg of dexamethasone 1 hour before the surgical procedure at the first or second surgery. The presence of trismus was analyzed through measurement of the interincisal distance (IID). These assessments were obtained before the operation and 24h and 48 h after the surgery. The results showed a significant difference in the measurements of the degree of swelling and trismus of the treated sample. 8 mg of dexamethasone promoted a greater reduction of symptoms than 4 mg of dexamethasone.¹²

CONCLUSION

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

REFERENCES

1. Miloro M, Ghali GE, Larsen PE, Waite PD. Peterson's Principles of Oral and Maxillofacial Surgery. 2nd ed. London: BC Decker Inc; 2004. p. 139.
2. Brown LH, Berkman S, Cohen D, Kaplan AL, Rosenberg M. A radiological study of the frequency and distribution of impacted teeth. J Dent Assoc S Afr. 1982;37:627-30.
3. Fanning EA, Moorrees CF. A comparison of permanent mandibular molar formation in Australian Aborigines and Caucasoids. Arch Oral Biol. 1969;14:999-1006.
4. Corssmit EPM, Dekkers OM. Screening in adrenal tumors. Curr Opin Oncol. 2019 May;31(3):243-246.
5. Bano G, Mir F, Beharry N, Wilson P, Hodgson S, Schey S. A Novel Medical Treatment of Cushing's Due to Ectopic ACTH in a Patient With Neurofibromatosis Type 1. Int J Endocrinol Metab. 2013 Winter;11(1):52-6.
6. Teachey DT, Pui CH. Comparative features and outcomes between paediatric T-cell and B-cell acute lymphoblastic leukaemia. Lancet Oncol. 2019 Mar;20(3):e142-e154.
7. Monreal JA, Duval F, Mokrani MC, Fattah S, Palao D. Differences in multihormonal responses to the dopamine agonist apomorphine between unipolar and

- bipolar depressed patients. *J Psychiatr Res.* 2019 May;112:18-22.
8. Polderman JAW, Farhang-Razi V, van Dieren S, Kranke P, DeVries JH, Hollmann MW, Preckel B, Hermanides J. Adverse side-effects of dexamethasone in surgical patients - an abridged Cochrane systematic review. *Anaesthesia.* 2019 Jul;74(7):929-939.
9. Wu X, Sun W, Tan M. Noncoding RNAs in Steroid-Induced Osteonecrosis of the Femoral Head. *Biomed Res Int.* 2019;2019:8140595.
10. Graziani F, D'Aiuto F, Arduino PG, Tonelli M, Gabriele M. Perioperative dexamethasone reduces post-surgical sequelae of wisdom tooth removal. A split-mouth randomized double-masked clinical trial. *Int J Oral Maxillofac Surg.* 2006 Mar;35(3):241-6.
11. Grossi GB, Maiorana C, Garramone RA, Borgonovo A, Beretta M, Farronato D, et al. Effect of submucosal injection of dexamethasone on postoperative discomfort after third molar surgery: A prospective study. *J Oral Maxillofac Surg* 2007;65:2218-26
12. Laureano Filho JR, Maurette PE, Allais M, Cotinho M, Fernandes C. Clinical comparative study of the effectiveness of two dosages of Dexamethasone to control postoperative Clinical swelling, trismus and pain after the surgical extraction of mandibular impacted third molars. *Med Oral Patol Oral Cir Bucal.* 2008;13:E129–E132.