ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

ORIGINAL RESEARCH

Comparison of Therapeutic Effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars

[1]Dr. Nikhel Dev Wazir, [2]Dr. Premlata, [3]Dr. Harvinder Singh, [4]Dr. Bela Mahajan, [5]Dr. Esha Bali, [6]Dr. Jasjit Kaur Sahota

[1]Professor & Head, Department of Conservative and Endodontics, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India
[2]Professor, Department of Oral and Maxillofacial Surgery, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India
[3]Professor and Head, Department of Prosthodontics, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India
[4]Professor and Head, Department Oral Pathology and Microbiology, IDS, Sehora Jammu, Jammu & Kashmir, India
[5]Reader and Head, Department of Public Health Dentistry, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India
[6]Professor, Department of Periodontology, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India

Corresponding author
Dr. Harvinder Singh
Professor and Head, Department of Prosthodontics, Institute of Dental Sciences, Sehora, Jammu, Jammu & Kashmir, India
Email: harvlobana@yahoo.co.in

Received: 13 November, 2022 Accepted: 26 December, 2022

Abstract

Aim: Comparison of therapeutic effects of 8 mg Dexamethasone Intramuscular Administered Pre-operatively vs. Post Operatively after the Surgical Extraction of Impacted Mandibular Third Molars.

Materials & methods: 100 outpatients who underwent surgical removal of lower third molar were included and were broadly divided into two study 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. Maximum interincisal opening was measured pre-operatively, 1st and 3rd day. Visual analogue scale was used to analyse the intensity of the pain (0-10). The results of the two groups were compared using t-test.

Results: Among the patients of group A, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.1 mm, 35.3 mm and 46.5 mm respectively. Among the patients of group B, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.6 mm, 31.7 mm and 39.4 mm respectively. Significant better results were obtained in terms of mouth opening among patients of group A. Mean VAS among the patients of group A at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.3 and 2.4 respectively. Mean VAS

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

among the patients of group B at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.1 and 2.1 respectively. Non-significant results were obtained while comparing the mean VAS at different time intervals.

Conclusion: It was concluded from the study that superior post-operativetherapeutic effects are achieved by pre-emptive administration of 8 mg intramuscular injection of dexamethasone

Key words: Dexamethasone, Surgical Extraction, Third Molars

Introduction

The prevalence of third molar impaction ranges from 16.7% to 68.6%. Most studies have reported no sexual predilection in third molar impaction. Some studies, however, have reported a higher frequency in females than males.[1]

Different authors advocate different school of thoughts regarding prophylactic removal of impacted teeth. There is no evidence of a significant increase in third-molar pathology with age. Of course, teeth that become repeatedly symptomatic or develop associated pathology should be removed. [2]

When a third molar, usually the mandibular third molar, partially erupts through the mucosa, a mild-to-moderate inflammatory response similar to gingivitis/periodontitis may appear. Sometimes the patient may actually have a severe infection that may require vigorous medical and surgical treatment. [3]

In the past, many different approaches, including drains, laser therapy and medications with enzymes, muscle relaxants or corticosteroids were clinically evaluated in an effort to minimize these post-operative sequelae. 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.[4- 6]

Dexamethasone has proven itself to be one of the most effective anti-inflammatory agents and this has been a prime reason for its use following the minor and the major surgical procedures in the field of oral and maxillofacial surgery across the globe in the last 3-4 decades.[7] 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 based the data collected prospectively from random group of 100 outpatients who underwent surgical removal of lower third molar. 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.

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. Under aseptic conditions patients were prepared. Local anaesthesia, 2% Lidocaine (1: 100000 epinephrine) were administered to all the patients. The patients were given the routine post-operative home care instruction. Maximum interincisal opening was measured pre-operatively, 1st and 3rd day. Visual analogue scale was used to analyse the intensity of the pain (0-10). The results of the two groups were compared using t-test.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

Results

Mean age of the patients of group A and group B was 25.1 years and 23.9 years respectively. Among the patients of group A, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.1 mm, 35.3 mm and 46.5 mm respectively. Among the patients of group B, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.6 mm, 31.7 mm and 39.4 mm respectively. Significant better results were obtained in terms of mouth opening among patients of group A. Mean VAS among the patients of group A at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.3 and 2.4 respectively. Mean VAS among the patients of group B at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.1 and 2.1 respectively. Non-significant results were obtained while comparing the mean VAS at different time intervals.

Table 1: Descriptive statistics for Mouth opening (mm)

Descriptive	Group A	Group B	p-value
Pre-operative Mouth opening (mm)	48.1	48.6	0.4478
Post-operative 1st day Mouth opening (mm)	35.3	31.7	0.000*
Post-operative 3rd day Mouth opening (mm)	46.5	39.4	0.000*

*: Significant

Table 2: Descriptive statistics for pain (VAS)

Variable	Group A	Group B	p-value
Pre-operative Pain Score (VAS)	0	0	-
Post-operative 1st day Pain Score (VAS)	4.3	4.1	0.11
Post-operative 3st day Pain Score (VAS)	2.4	2.1	0.35

Discussion

Third molars are the most frequently impacted teeth because of their particular topography, phylogeny and ontogeny. They are directly or indirectly associated with numerous disorders in the mouth, jaw and facial regions. Therefore, the extraction of third molars is one of the most common surgical procedure for Oral and Maxillofacial surgeons. Various causes have been suggested in the literature for the impaction of the third molar. It has been suggested that the gradual evolutionary reduction in the size of the human mandible/maxilla has resulted in too small mandible/maxilla that may accommodate the corresponding molars. It has also been found that the modern diet does not offer a decided effort in mastication, resulting in loss of growth stimulation of jaws, and thus the modern man has impacted and unerupted teeth. Corticosteroids have potent anti-inflammatory activity, and have been used at different dosages and through various routes of administration to lessen the inflammatory effects of third molar surgical removal.[6- 9]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.

Mean age of the patients of group A and group B was 25.1 years and 23.9 years respectively. Among the patients of group A, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.1 mm, 35.3 mm and 46.5 mm respectively. Among the patients of group B, mean mouth opening during preoperative period, postoperative 1st day and postoperative 3rd day was 48.6 mm, 31.7 mm and 39.4 mm respectively. In a previous study conducted by Arabia S et al, authors compared the therapeutic effects of 8 mg dexamethasone intramuscular administered pre-operatively vs post-operatively after the surgical extraction of impacted mandibular third molars. 150 patients constituted the study and were randomly divided into two groups. Group A received

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

8 mg dexamethasone (intramuscular) 1hr pre-operatively. Group B received 8 mg dexamethasone (intramuscular) immediately after the surgery. According to the gender there were 81(54%) males and 69 (46%) females, in both the groups combined. Males to females' ratio was 1.17: 1 in this study. Post-operative 1st and 3rd day follow-up showed that there was a significant difference between the two groups in terms of swelling and mouth opening (P=0.000). Overall, Group A showed much better results as far as the post-operative swelling and mouth opening was concerned. There was no statistical difference in the scores when the post-operative pain was evaluated on 1st, 3rd and 7th day (P=0.679, P=0.755, P=0.202). The depth, angulation and the position of the tooth did not affect the study in terms of significance (P=0.626, P=0.874, P=1.000). It was concluded that preoperative administration of single dose of dexamethasone intramuscularly was more effective than the postoperative period, in reducing the swelling and trismus.[9]

Significant better results were obtained in terms of mouth opening among patients of group A. Mean VAS among the patients of group A at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.3 and 2.4 respectively. Mean VAS among the patients of group B at preoperative time, postoperative 1st day and postoperative 3rd day was 0, 4.1 and 2.1 respectively. Non-significant results were obtained while comparing the mean VAS at different time intervals. Sitthisongkhram K, et al evaluated the effects of preoperative and postoperative injections of 4 mg of dexamethasone into the pterygomandibular space on postoperative pain, facial swelling, and the restriction of mouth opening following lower third molar surgical removal. Twenty-seven participants with bilateral symmetrical lower impacted third molars were included in this study. Each participant was randomly allocated to one of two groups. Group A received injections of 1 ml dexamethasone (4 mg/mL) and 1 mL placebo into the pterygomandibular space before and after surgery, respectively. Group B received the same doses of placebo before surgery and dexamethasone after surgery. A significant restriction of mouth opening on the second postoperative day was observed in both groups. Nonetheless, the postoperative restriction of mouth opening, facial swelling, postoperative pain, and analgesic consumption after lower third molar surgical removal were not significantly different in the two groups. Regardless of the time of administration, dexamethasone injections into the pterygomandibular space resulted in satisfactory control of the postoperative sequelae of the mandibular third molar surgical removal.[10]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 selling 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.[11]

Conclusion

It was concluded from the study that superior post-operativetherapeutic effects are achieved by pre-emptive administration of 8 mg intramuscular injection of dexamethasone.

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

References

1. Archer WH. Oral Surgery: A Step-By-Step Atlas of Operative Techniques, 4th ed. Philadelphia: W.B. Saunders Company; 1966. p. 507-10.
2. Peterson LJ. Principles of Management of Impacted Teeth. In: Peterson LJ, Ellis E III, Hupp JR, Tuker MR, editors. Contemporary Oral and Maxillofacial Surgery, 3rd ed. St. Louis: Mosby; 1998. p. 215-48.
3. Vegas-Bustamante E, Mico-Llorens J, Gargallo-Albiol J, Satorres-Nieto M, Berini-Aytes L, Gay-Escoda C. Efficacy of methylprednisolone injected into the masseter muscle following the surgical extraction of impacted lower third molars. Int J Oral Maxillofacial Surg. 2008; 37:260–263.
4. Costa MG, Pazzini CA, Pantuzo MC, Jorge ML, Marques LS. Is there justification for prophylactic extraction of third molars? A systematic review. Braz Oral Res. 2013;27(2):183–188.
5. Mettes TG, Ghaeminia H, Nienhuijs ME, Perry J, Van der Sanden WJ, Plasschaert AJ. Surgical removal versus retention for the management of asymptomatic impacted wisdom teeth. Cochrane Database Syst Rev. 2012;6 CD003879.
6. Lindauer SJ, Laskin DM, Tüfekçi E, Taylor RS, Cushing BJ, Best AM. Orthodontists' and surgeons' opinions on the role of third molars as a cause of dental crowding. Am J Orthod Dentofacial Orthop. 2007;132(1):43–48.
7. Yuasa H, Sugiura M. Clinical postoperative findings after removal of impacted mandibular third molars: prediction of postoperative facial swelling and pain based on preoperative variables. Br J Oral Maxillofacial Surg. 2004 Jun;42(3):209-14.
8. Juodzbalys G, Daugela P. Mandibular third molar impaction: review of literature and a proposal of a classification. J Oral Maxillofacial Res. 2013;4(2): e1. Published 2013 Jul 1. doi:10.5037/jomr.2013.4201
9. Arabia S. Comparison of therapeutic effects of 8 mg dexamethasone intramuscular administered pre-operatively vs. post operatively after the surgical extraction of impacted mandibular third molars. Journal of Dental and Craniofacial Research. 2018;3(2):9.
10. Sitthisongkhram K, Niyomtham N, Chaiyasamut T, Pairuchvej V, Kumar KC, Wongsirichat N. Effectiveness of dexamethasone injection in the pterygomandibular space before and after lower third molar surgery. J Dent Anesth Pain Med. 2020 Oct;20(5):313-323.
11. Gaspar BDS, de Castro JKS, Ferraro-Bezerra M, Amora-Silva BF, de Barros Silva PG, de Vasconcelos V, Avelar RL, Alencar PNB. Effects of pre and postoperative dexamethasone for control of pain, swelling and trismus after third molar surgery: a randomized, triple-blind clinical trial. J Dent Health Oral Disord Ther. 2020;11(2):42–48.