

Submucosal Dexamethasone Vs Intramuscular Dexamethasone in Surgical Extraction of Third Molars- A Retrospective Study

Research Article

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Abstract

Transalveolar extraction of mandibular third molar is a cumbersome and dreaded procedure. For most of the patient it brings discomfort to interfere the daily chores because of post pain, swelling and trismus. In this prospective randomised study, we evaluate the effect of dexamethasone of pain, swelling and trismus. A total of 44 patients were enrolled in this prospective study that are divided into two groups. Group A (22 patients) to receive submucosal dexamethasone and Group B (22 patients) to receive intramuscular dexamethasone postoperative to the mandibular third molar extraction. Equal number of males and females in both groups are taken in this study. SPSS software was used for analysis. There was no significant difference in the demographic data and duration of surgery between the groups. Pain and trismus was more marked on the 3rd day and slowly reduced but no significant difference between the groups. They give comparable result when used intraoperatively during third molar surgery.

Keywords: Dexamethasone; Intramuscular; Prospective; Submucosal; Transalveolar Surgery.

Introduction

Sometimes a tooth may fail to emerge into proper alignment and remains “entrapped” in the gum tissue and jaw bone. Such a tooth is referred to as an impact. Impactions may occur due to various reasons. For example, the jaw may be too small and there may be insufficient space for the teeth to erupt. Teeth may also become twisted, tilted, or displaced as they try to emerge, resulting in impacted teeth. The most common impacted teeth are wisdom teeth or third molars.

Impacted teeth may result in swelling, pain and infection of surrounding gum tissue. Also, impacted teeth may cause permanent damage to nearby teeth or lead to the formation of cysts or tumors that can destroy sections of the jaw. Therefore, it is often recommended that impacted teeth be promptly removed. Transalveolar extraction of impacted third molars is the most commonly found procedure by oral and maxillofacial surgeons

[1]. It involves intentional and minor trauma to the hard and soft tissue surrounding the teeth that generally leads to pain, swelling and trismus that brings the patient discomfort for social well being [2]. The prime concern of each and every dentist is to reduce the postoperative sequelae.

This extraction can involve injury which further cause trauma leading to inflammation due to action of phospholipase. These are preferred to act as mediators of inflammation. This peaks during the 2nd day after extraction [3]. The first step is to reduce inflammation caused due to injury this leads to reduction in fluid translation and a decrease in edema [4]. These corticosteroid drugs can be administered orally, submucosally or intravenously. Even though there are many routes there is no clear evidence that provide quick relief [5]. In this prospective randomised study, we evaluate the effect of dexamethasone by either giving submucosal or by intramuscular route to reduce on pain, swelling and trismus.

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Received: November 10, 2020

Accepted: December 15, 2020

Published: December 18, 2020

Citation: Harini G, Dinesh Prabu, Balakrishnan RN. Submucosal Dexamethasone Vs Intramuscular Dexamethasone in Surgical Extraction of Third Molars- A Retrospective Study. *Int J Dentistry Oral Sci.* 2020;7(12):1222-1225. doi: <http://dx.doi.org/10.19070/2377-8075-20000241>

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Materials And Methods

- This Study was conducted in the oral and maxillofacial surgery department .Datas were collected by reviewing the patient records and analysed the data of 86,000 patients. Group-A-Sub-mucosal dexamethasone and Group-B-Intramuscular dexamethasone. Total of which 44 patients were involved who undergone mandibular third molar extraction.
- Both male and female were taken equally in both the groups for this study.

Inclusion Criteria

18-48 years with no active infection at time of extraction .

Exclusion Criteria

- Immunocompromised patients
- Patient with allergic reaction to lignocaine,dexamethasone.
- Patient with steroid use.
- Lactation and pregnant women.
- Using antibiotics are excluded in the study.

Statistical Analysis

The data was analysed using SPSS software by means of the value to be recorded and the test of significance was applied in chi-square test. The probability value of less than 0.05 considered as significant.

Results And Discussion

A total of 44 patients were enrolled in the prospective study. This study was conducted from 1st april 2019-1st april 2020

Table-1 illustrates the demographic data related to the patient and mean duration of surgery among the groups.The mean age in group A was 30.6 yrs+/- 4.6 years and group B was 29.6 yrs+/- 5.2 years. Equal gender with 22 patients was taken for both group-A and Group-B. The mean time duration of surgery was less than 30 minutes.

The other table-2 illustrates the comparison of pain score among both the groups. On 7 th postoperative day Group A and Group B, no patient had severe pain. Group A - 4 patients had moderate pain, 9 patients had mild pain and 9 patients had no pain. In group B only 2 patients had moderate pain 10 patients had mild pain and 10 patients had no pain, there was no statistical significant difference between the groups on 3 rd and 7 th postoperative day. Pearson chi-square value-1.034 and p-value was found to be 0.73 for 3rd post-operative day and Pearson chi-square value-2.062 and p-value was found to be 0.35 for 5th postoperative day this implies that there are no statistical significance between two groups.

Removal of the mandibular wisdom tooth is one of the most painful,frightful and dreadful amongst patients [6]. Its associated consequences like pain,swelling and trismus can interfere with patient social well being, Operators are trying their best to reduce this discomfort.Various techniques and medications are put into to reduce sequelae [7]. Corticosteroids like dexamethasone and methylprednisolone because of their pure glucocorticoids and

Figure 1. Bar graph shows Third postoperative day association between pain scores and groups. X-axis denotes severity of pain and Y-axis denotes no.of.patients. In both Group-A and Group-B Moderate and severe pain was experienced during the 3rd post operative day. 27% of the patient in Group-A (Blue) experienced moderate pain. However the test was found to be statistically non-significant using Chi-square test (Pearson chi-square value-0.94 and p-value-0.763).

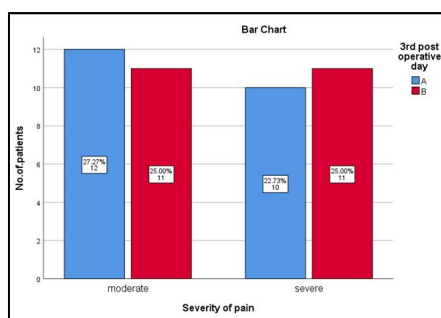


Figure 2. Bar graph shows seventh postoperative day association between pain and groups. X-axis denotes severity of pain and Y-axis denotes the number of patients. In both Group-A and Group-B patients experienced no pain,moderate and mild pain. Majority of patients in both Group-A (Blue) and Group-B (pink) experienced a range of mild to no pain. Therefore, the difference was found to be statistically not significant (Pearson chi-square-1.983 and p-value-0.98).

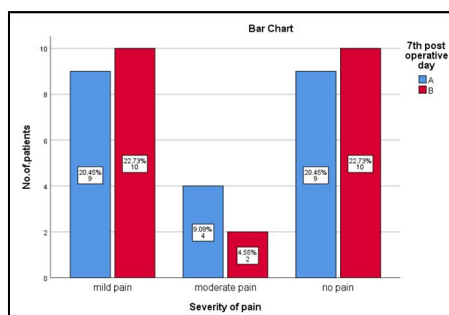


Table 1. Shows the variables of age,gender and duration of surgery. The mean age of the patient participated in the study in Group-A is 30.6 ± 4.6 years and Group-B is 29.6 ± 5.2 years. Equal distribution of gender was taken in both the groups. The duration of surgery done in both groups are less than 30 minutes.

Variables	GROUP A(Submucosal)	GROUP B(Intramuscular)
Age (Mean)	30.6 ± 4.6 years	29.6 ± 5.2 years
Gender n(%)	Female	11(25%)
	Male	11(25%)
Duration of surgery	>30 minutes	> 30 minutes

Table 2. Comparison of pain scores(VAS) between group A and group B. Chi-square test was used to find difference between the groups at 3rd postoperative day(Pearson chi-square value-1.034; $p > 0.05$) and 7th postoperative day (Pearson chi-square value-2.062; $p > 0.05$). Even Though the test was found to be statistically not significant, severe pain score was observed at 3rd postoperative day among 11 (50%)study subjects in Group B and during 7th postoperative day, moderate pain was experienced by 4(20%) in Group A.

TIME OF SURGERY	VAS	GROUP-A n(%)	GROUP-B n(%)	Pearson chi-square value	P-value
3rd postoperative day	No pain(score 0-1)	0(0%)	0(0%)	1.034	0.73
	Mild pain(score 1-3)	0(0%)	0(0%)		
	Moderate pain(score 4-6)	12(54%)	11(50%)		
	Severe pain(score 7-9)	10(46%)	11(50%)		
7th postoperative day	No pain(score 0-1)	9(40%)	10(45%)	2.062	0.35
	Mild pain(score (1-3)	9(40%)	10(45%)		
	Moderate pain (4-6)	4(20%)	2(10%)		
	Severe pain(7-9)	0(0%)	0(0%)		

no mineral solid effort can be used in dentoalveolar surgery and least adverse effect on leukocyte chemotaxis [8, 9]. Hence they have gained widespread importance in this arena [10]. In metaanalysis by [11], he interfered that giving corticosteroids like dexamethasone has mild to moderate value in reduction of post-operative inflammatory signs and symptoms.

El hag et al [11] in their study compared 1 mg dexamethasone injection he included the significant reduction Dexamethasone has half life of 36-72 hours. He concluded that there is significant reduction in swelling and trismus following third molar surgery. According to a study [12], marked reduction in pain, swelling and trismus were seen after administration of intravenous 125 mg of methylprednisolone preoperatively following mandibular third surgery. According to a similar study conducted by [13], a marked reduction in oedema was seen on the first postoperative day but there was a rebound increase in oedema on the 2nd and 3rd post operative day. Dexamethasone has a half life of 36-72 hours. Corticosteroids stabilize the lysosomal membrane and therefore prevent the release of proteolytic enzymes. They also decrease the capillary permeability and therefore lead to reduction in oedema [14].

According to our study there was no significant difference in trismus in both the groups which correlated with the study done by [15] where intramuscular application of dexamethasone produced marked reduction in trismus but its submucosal administration did not produce notable results Various factors such as age ,gender and operating time have also been seen to influence healing and swelling after surgery. But in our study these variables

were insignificant and the same surgeon performed all the surgery therefore no impact. Considerable research has been conducted in the field of oral and maxillofacial surgery with relevance to the current population under study [16-30]. This study attempts to identify the effectiveness among the population. Further studies with a larger population is advised.

Conclusion

From the results of present study we can conclude that submucosal or intramuscular dexamethasone has no significant difference in postoperative sequela and therefore any route can be used after surgery without many variations. Dexamethasone given submucosally or intramuscularly is an effective way of minimising swelling, trismus, and pain after removal of impacted lower third molars, and is comparable with the intramuscular route. It offers a simple, safe, painless, non-invasive, and cost-effective treatment in moderate and severe cases.

Authors Contribution

First author (Harini G) performed analysis, and interpretation and wrote the manuscript. Second author (Dr Dinesh Prabu) contributed to conception, data design, analysis, interpretation and critically revised the manuscript. Third author (Dr. Bala Krishnan R N) participated in the study and revised the manuscript. All the three authors have discussed the results and contributed to the final manuscript.

Acknowledgement

This study was supported by Saveetha institute of technical and medical sciences, Chennai.

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