

## A COMPARATIVE STUDY- PREOPERATIVE INTRALESIONAL INJECTION OF DEXAMETHASONE VS. NORMAL SALINE FOR LOWER THIRD MOLAR SURGERY

### Dental Science

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### ABSTRACT

**Introduction:** The surgical removal of impacted mandibular third molar is one of the most frequent surgical interventions in dentistry. The purpose of this study was to observe and compare the effects of dexamethasone on pain, swelling and trismus administered as a preoperative single intralesional dose versus normal saline in the mandibular third molar surgery.

**Materials And Method:** The study consisted of 30 patients of which 16 were females and 14 were males. 15 patients in the study group were given single dose of preoperative intralesional injection of dexamethasone, 2ml of 8mg and 15 patients in the control group were given normal saline. The postoperative pain, trismus and edema were assessed for both the groups.

**Results:** A single dose of preoperative intralesional injection of dexamethasone showed statistically significant improvement in postoperative pain, swelling and trismus on the 2nd and 7th post-operative day compared to the control group.

**Conclusion:** A single preoperative intralesional administration of dexamethasone effectively reduces postoperative sequelae and discomfort following third molar surgery

### KEYWORDS

Intralesional injection of dexamethasone, impacted third molars, postoperative sequelae, swelling, trismus, pain

### INTRODUCTION

The surgical removal of mandibular third molar is one of the most frequent procedures performed by oral and maxillofacial surgeon. Removal of third molar is often associated with postoperative swelling, trismus, pain. It depends on several factors like difficulty in the removal, time taken and severity of the procedure. Inflammatory process is necessary for healing but if exacerbated can lead to postoperative discomfort. [1] Any surgical intervention alleviates the inflammatory response in the body which could lead to postoperative discomfort. The symptoms are observed gradually, peaking 2 days after extraction. [2] Inflammatory response occurs due to the conversion of phospholipids into arachidonic acid by phospholipase A2 enzyme and results in synthesis of prostaglandins, leukotrienes and thromboxane related substances, which are the mediators of inflammation. [2] Dexamethasone is steroidal anti-inflammatory drug, widely used in oral and maxillofacial surgery. It is synthetic analogue of prednisolone which regulates the inhibition of prostaglandin synthesis. It has a powerful analgesic and anti-inflammatory effect. [1] Dexamethasone is a long acting corticosteroid with a half-life of 36 to 48 hours. The rate at which drug absorbs depends on the area of maximum blood flow [3]. The site adjacent to the third molar is the pterygomandibular space, it is highly vascularized comprising of loose areolar connective tissue and has the maximum absorption of drug. Therefore, distal to third molar area was chosen as the site of drug injection for better absorption.

### MATERIAL AND METHOD

The prospective randomized study was carried out in the department of oral and maxillofacial surgery at Navodaya dental college and hospital, Raichur, Karnataka. The study involved 30 patients of which 16 were females and 14 were males, who required the removal of single impacted mandibular third molar under local anesthesia. The use of antibiotic or anti-inflammatory drug within 2 weeks of study entry, pregnancy or lactation, procedures lasting more than 60 minutes, immunocompromised patients, history of allergy to the drug used were excluded from the study. Patients were randomly divided into two groups. Study group (Group 1) consisted of 15 patients who received single dose of intralesional preoperative dexamethasone, 2ml of 8mg. Control Group (Group 2) consisted of 15 patients who received

intralesional preoperative normal saline. The study followed standard surgical technique under local anesthesia. The inferior alveolar, lingual and long buccal nerve block was given using local anesthesia with 2% adrenaline. After administration of local anesthesia, intralesional injection was given distal to the third molar in the respective groups. Full thickness mucoperiosteal flap limited to the second molar was raised. Osteotomy was performed using tungsten carbide bur mounted on the high speed hand piece. Socket irrigation was performed using betadine and saline after the impacted tooth was removed. The full thickness mucoperiosteal flap was then sutured with 3-0 silk. Interrupted sutures were placed. No medications were given during the procedure. At the initial visit and at postoperative 2nd and 7th day the information was recorded by a single examiner. Patients were informed to take oral antibiotic amoxicillin 500mg twice a day, metrogyl 400mg thrice a day for 5 days and Aceclofenac for the pain relief.

### Assessment Of Pain

The degree of pain was assessed using a visual analogue scale (VAS) scale which ranged from 0 to 10 where 0 indicated no pain, 1-3 mild pain, 4-6 moderate pain and 7-10 severe pain. (Fig. 1)

### Assessment Of Swelling

Evaluation of swelling was done in horizontal or transverse axis and vertical axis using 3-0 silk suture. In horizontal axis measurements were taken from gonial angle on one side to the other and in vertical axis from the centre of the lower lip to the upper border of the thyroid cartilage with the neck extended behind.

### Assessment Of Trismus

Limited mouth opening was measured as maximal interincisal distance, distance between the upper and lower incisor edge using a metal scale.



Fig 1

## RESULTS

30 patients were included in the study (16 females, 14 males) and were randomly assigned to two groups of the study. 15 patients were allocated to study group and control group each. The assessment of swelling, trismus, pain was done on the day of surgery and 2nd and 7th post-operative day. The results showed statistical significance ( $P < 0.05$ ) in edema in transverse axis among both the groups (Fig. 2a). There was increased swelling in transverse axis in control group on the 2nd and 7th post-operative day compared to the study group. No statistical significant difference was found in edema in the vertical axis on postoperative assessment days among both the groups. (Fig. 2b) As for Pain group 1 and group 2 showed statistically significant result. Study group showed lowered pain on 2nd and 7th postoperative day. [Fig.3] Control group showed limited mouth opening on the 2nd and 7th postoperative day compared to the study group (Fig.6). Gradual improvement was seen in post-operative sequelae on the 7th postoperative day among both the groups.

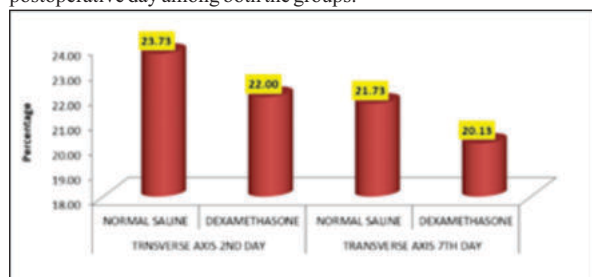


FIG 2a

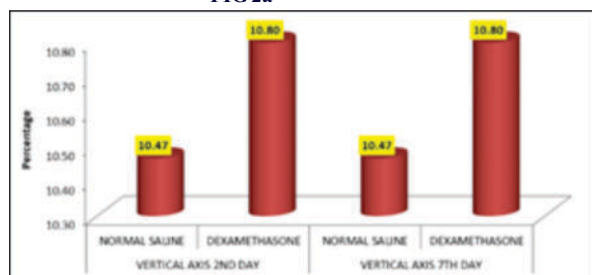


FIG 2b

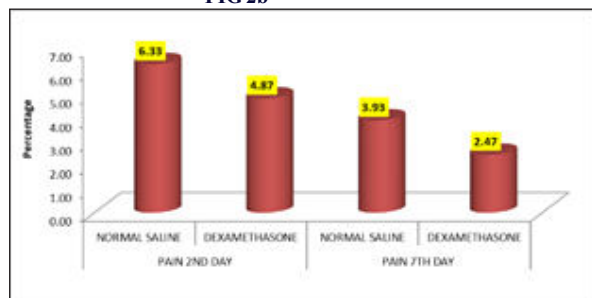


FIG 3

## DISCUSSION

Third molar extraction is one of a traumatic surgical procedure in the oral and maxillofacial surgery. Postoperative pain and inflammation may induce dental fear in the patient. Post-operative swelling may lead to trismus due to compression of nerves causing mild to severe pain, in the study conducted by Laureano Filho JR showed trismus is a sequelae of swelling. [4]

Dexamethasone was chosen for the study because of its safe administration and long biological half-life of 36-48 hours. It prevents the homeostatic defence mechanism from overshooting and compromising the wound healing. [4]

Intralesional injection of dexamethasone used in our study does not require additional armamentarium or clinical expertise. It ensures rapid, nearly complete absorption and offers great patient comfort. [5]

It provides ease to the patient and surgeon as the injection site is close to the area operated and in a previously anesthetized area which ensures improved recovery with less pain. [1]

In the present study intralesional dexamethasone proved effective in reducing postoperative trismus, swelling and pain which were in agreement with the study conducted by M. Brucoli et al. in which three routes of administration of dexamethasone were compared, intravenous, intralesional and oral administration. The results of their study proved that intralesional route has better outcome in almost all considered parameters, offers great patient comfort, ensures rapid nearly complete absorption. [1]

In agreement with Grazini et al. our data showed that single dose of intralesional dexamethasone showed decreased swelling on the 2<sup>nd</sup> postoperative day. In contrast to Grazini et al. our results showed no statistical significant difference among both the groups on the 7<sup>th</sup> post-operative day. [6]

In the study conducted by De Oliveria Jr et al. [9], he suggested that preoperative administration of the drug provides a greater effect on postoperative pain. In the current study, dexamethasone was injected before the operation after local anesthesia to get the maximum benefit from an early onset of drug action.

Edema following third molar surgery diffuses in different planes and is very difficult to measure accurately (Bamgbose et al. 2005) [14]. In the present study edema was measured in horizontal axis (gonial angle on one side to the gonial angle on the other side) and vertical axis (from the lower lip in the center to the upper border of thyroid cartilage)

Retromolar area consists of pterygomandibular space which is made up of loose areolar tissue and its highly vascular increasing the rate of absorption of drug therefore in the current study distal to the third molar was chosen as the site of injection. The results of our study highlighted on potential success of dexamethasone in controlling postoperative symptoms similarly was proved in study by Warraich et al. which showed that a single dose of intralesional injection is effective in controlling pain, swelling and trismus after third molar surgery. [8]

## CONCLUSION

The study concluded that single dose of intralesional dexamethasone at the surgical site was found to be more effective in lowering the post-operative pain, swelling and trismus after the removal of third molar. It is a safe and effective method for reducing the post-operative symptoms and promotes swift recovery and satisfaction.

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