ORIGINAL ARTICLE

EFFECT OF DEXAMETHASONE ON SWELLING, PAIN AND TRISMUS FOLLOWING THIRD MOLAR SURGERY

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ABSTRACT

Background: Complications like swelling, trismus, and pain are common after third molar surgery. This study was conducted to evaluate the therapeutic effect of dexamethsone on these complications.

Material & Methods: This study was conducted at Hayatabad Medical Complex, Peshawar. Hundred patients with bilateral mandibular impaction were included in this study. One side of the patient last mandibular molar either right or left, was allocated randomly as control and the other side as study group. Study group received 8 mg intramuscular dexamethasone one hour prior to surgical extraction. Patients with contraindication to the use of steroids were excluded from this study. Facial swelling and maximal interincisal distance were measured by an independent examiner at baseline (preoperatively), and at 2nd, and 5th days postoperatively. Pain was measured by counting the number of rescue analgesic tablets taken, and from the patients' response to a visual analogue scale.

Results: The dexamethasone group showed significant reduction in swelling ($p<0.001$) and pain ($p<0.05$) compared with the control group at all intervals. Intramuscular dexamethasone resulted in significantly less trismus than controls on day 2 postoperatively ($p= 0.037$), but there was no significant difference among the groups at 5th day.

Conclusion: Dexamethasone 8 mg given intramuscularly is effective in minimizing swelling, pain and trismus after removal of impacted lower third molar.

KEY WORDS: Third molar tooth, Dexamethasone, Pain, Trismus.

INTRODUCTION

The removal of lower third molar is still the most common surgical procedure done by oral and maxillofacial surgeons.[1] As it involves trauma to hard and soft tissue therefore beside severe complications such as dysasthesia, severe infection, fracture and dry socket, patients frequently complain of pain, swelling and limitation in mouth opening or trismus.[2,3] These post surgical sequelae can have a serious impact on the patient's quality of life.[4] These are due to postoperative inflammatory response and the use of corticosteroids has gained wide acceptance. Corticosteroid such as dexamethasone may inhibit the initial step in the synthesis of prostaglidins, leukotrienes and thromboxane-related substances by inhibiting the conversion of phospholipids into arachidonic acid with a reduction of fluid transudation and therefore edema.[5] Over several decades many studies have reported the effectiveness of corticosteroids given before or just after removal of third molars in improving recovery.[4,6-10] A single preoperative or postoperative intra-muscular dose gives good plasma concentrations of the drug with prolonged anti-inflammatory action.[11]

The anti-inflammatory effects of steroid after oral surgical procedures are well established. Since dexamethasone has been shown to reduce post operative edema, it was decided to investigate the specific effects of dexamethasone on swelling, trismus and pain following removal of impacted mandibular third molars.

MATERIAL AND METHODS

This randomized prospective study was conducted at the Department of Dentistry, Hayatabad Medical Complex, Peshawar, from June 2010 to December 2010. One hundred volunteers took part in this study, who presented themselves for extraction of bilateral impacted 3rd molar teeth. After taking history and thorough clinical examination periapical x-rays were taken for all selected patients. Inclusion criteria included partially impacted mandibular third molars with Class II or III occlusions and Pell and Gregory classification A, B or C on the radiograph. Subjects had no pericoronitis or infection at the time of operation. Patients with contraindication to the use of steroid i.e. hypertensive, GIT ulcer, diabetics, bacterial infections, history of thromboembolic events, glaucoma, psy-

chosis, patients taking other medications chronically and pregnant were excluded from the study. Written informed consent was obtained from each patient prior to inclusion in the trial.

As all hundred patients were having bilaterally impacted mandibular third molars, therefore in each individual molar of one side was randomly assigned to the study group and the other side to the control series, thus each group consisting of hundred impaction cases. The study group received 8 mg dexamethasone intramuscularly one hour before surgery, while the control received no such medication. Extractions of the two impacted teeth (one side study group and other side control) were carried out at six weeks interval. All patients were operated under local anesthesia by the same oral & maxillofacial surgeon. In most of the procedures, ostectomy with tooth sectioning were performed. All patients were given Amoxicillin 500 mg 8 hourly orally for 5 days, and ibuprofen 400 mg orally as required for analgesia. They were also given a chlorhexadine mouth rinse twice daily starting on the day after operation for 5 days.

A single examiner recorded edema, trismus and pain before and after each surgical wisdom tooth removal. Clinical measurements were performed on 2nd and 5th days after the surgical procedure.

Facial edema was evaluated by measuring the distance from the corner of the mouth to the attachment of the ear lobe following the bulge of the cheek, and the distance from the outer canthus of the eye to the angle of the mandible. The preoperative sum of the two values (mm) was taken as the baseline for that side.

Trismus was recorded as the difference in interincisal distance at maximum mouth opening before and after the operation.

Severity of pain perception was assessed via a simplified visual analogue scale (VAS), 100 mm in length, where '0' was marked as 'no pain' and '100' as the most severe pain imaginable.[7]

The significance of differences between the groups was calculated with the help of the Statistical Package for the Social Sciences (SPSS) version 12. Probabilities of less than 0.05 were taken as significant.

RESULTS

Among the 100 patients of bilaterally mandibular impacted molars, there were 60 males and 40 females. The mean age was 20 years. Total of 200 surgical extractions were done, 100 in control group and 100 in dexamethasone group. At follow-up, no patients developed wound infection or serious post-operative complications and any drug side effect.

Table 1: Mean measurements of swelling, trismus and pain among the groups.

Variables	Control group	Dexamethasone group	p-value
Swelling (mm)			
Day 2	5.5	1.8	<0.001
Day 5	1.8	0.3	<0.001
Trismus (mm)			
Day 2	20.5	7.0	0.037
Day 5	12.8	5.1	0.07
Pain (VAS)			
Day 2	6.3	3.6	0.04
Day 5	4.1	0.7	0.005

VAS=Visual analogue scale (1-10)

There was a significant reduction in swelling both on 2nd (p<0.001) and 5th (p<0.001) post-operative days in dexamethasone study group as compared to controls. Trismus differed significantly between the dexamethasone group and the control on 2nd post operative day (p<0.037) but not on 5th day (p=0.07).

There was also significant reduction in pain post-operatively in dexamethasone group as compared to control group. (Table 1)

DISCUSSION

The surgical removal of third molars is often associated with severe postoperative discomfort, even when teeth are removed using a gentle surgical technique.[1] Perioperative use of corticosteroids is a pharmacological approach often used to limit postoperative edema , trismus, and pain after removal of impacted mandibular third molars due to their suppressive action on transudation.[11,12] Numerous papers have supported their systemic use in third molar surgery.[8,11–15] Recently, Markiewicz et al.,[16] in a meta-analysis, concluded that giving corticosteroids perioperatively was of mild to moderate value in reducing post operative inflammatory signs and symptoms. Specifically, patients given corticosteroids had significantly less post operative swelling and trismus than controls, both early (after 1–3days) and late (after 4–7 days). In addition, those who took corticosteroids reported less pain postoperatively than control groups. However, the effect on postoperative morbidity, and the duration of the effect of the corticosteroids, varied mainly as result of lack of consensus about the optimal route, dose, tim-

ing, and duration of treatment in addition to differences in methods used to evaluate clinical variables.

The steroid elected should have few mineralocorticoid effects and good biological activity. Dexamethasone meets these requirements, as it has no mineralocorticoid activity, the half-life is roughly 36-72 hours, and the drug is 25 times more potent than hydrocortisone. It also seems to have the least depressing effect on leukocyte chemotaxis.[3,17]

Few studies have objectively evaluated the effect of dexamethasone as an intramuscular injection in third molar surgery, although this route is the one most likely to be used when a steroid injection is prescribed in outpatients. Intramuscular dosing studies have suggested that this route can be effective if a single dose is given either preoperatively or postoperatively.[2,5,6] The effect may be dose-dependent. Some authors suggested using dexamethasone 8–12 mg for the best results.[15] In this study intramuscular dexamethasone resulted in significant reduction in swelling postoperatively. This was as highly significant on the 2nd postoperative day, when maximum facial swelling is expected,[15] as after five days. The result of this study is in agreement with those of previous studies.[18,19,20]

Acute postoperative pain following third molar extraction is predominantly a consequence of inflammation caused by tissue injury.[21] Dexamethasone in particular appears to decrease pain after surgery.[22] This study shows a significant decrease in patients' pain perception when comparing control to dexamethasone group. This appears to be widely in agreement with the existing literature.[6,7,9,10]

A statistically high significant difference between dexamethasone group and control was observed overtime for trismus in this study. Test procedure did show a reduced postoperative degree of trismus, which is in agreement with the previous studies.[7,9-11,15]

CONCLUSION

Dexamethasone 8 mg given intramuscularly one hour before removal of impacted lower third molar is an effective way of minimizing postoperative swelling, trismus, and pain.

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