USE OF ORAL DEXAMETHASONE IN IMPACTED MANDIBULAR THIRD MOLAR SURGERY

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ABSTRACT

A prospective study was carried out in the Armed Forces Institute of Dentistry (AFID) Rawalpindi/ PIMS Islamabad. The aim of study was to compare the efficacy of a single pre-operative (8mg) dose of oral dexamethasone against a pre and two post operative (14mg) administration of oral dexamethasone for prevention of post operative edema after impacted third molar surgery. The result of study showed that (8mg) pre-operative dose of the oral dexamethasone can be used safely to reduce the degree of facial swelling up to 45%, where as the use of pre & post operative doses of the oral dexamethasone (14mg) are neither advantageous nor advisable for reducing post operative edema after surgical removal of the impacted mandibular third molar.

Key words: POD = Post Operative day-Con-Control. SD-Single dose. MD-Multiple dose. Pt-Patient. NS- no swelling. Mi-mild swelling. Mod-moderate. Sev-severe.

INTRODUCTION

The history of impacted teeth is as old as the dental medicine itself. Third molars of Stone Age man erupted in the early teens, therefore the impacted teeth are rightly called the gift of modern civilization. Third molars are the commonest teeth to be found impacted in order of frequency (98%) followed by upper canine (1.3%) and lower pre-molars (0.11%)8. The removal of impacted mandibular third molar is one of the commonest surgical procedure undertaken in oral and maxillofacial units6.

The majority of impacted teeth are removed as they give rise to symptom of pain, or become foci of infection or when not coming into occlusion. On the other hand the risks of non-intervention for impacted mandibular third molar may include certain infections, cysts or tumor formation, pressure resorption of adjacent teeth or periodontal pocketing7.

The post operative swelling following third molar surgery is usually associated with tissue trauma, which sometimes may extend towards neck region and become disastrous for both patient and surgeon. The swelling following surgery can be limited by ice pack fomentation, certain proteolytic enzymes and use of corticosteroids.

Messer & Keller (1975) using dexamethasone reported reduction in swelling following third molar surgery, but the use and regimen of corticosteroids in third Molar surgery is still debatable. The aim of present study is to define the benefits of 8 mg single preoperative dose of oral dexamethasone as compared to single preoperative along with postoperative doses, i.e, 14 mg for prevention of swelling after third molar surgery.

MATERIALS AND METHODS

A prospective study was carried out at Armed Forces Institute of Dentistry (AFID), Rawalpindi. Total 75 patients were selected with age range from 18 to 40 years with a mean age of 27 years. Only unilateral cases of either right or left side were included in the...
Diagnosis of impaction was established on detail history, clinical and radiological examination. The patients were divided into three different groups:

I  Control (Cont) group n=25  
II  Single dose (SD) group n=25  
III Multi dose (MD) group n=25

The control group was treated without administration of study drug dexamethasone one (Decadron), either before or after surgery. In single dose (SD) group patient received only a single preoperative dose of 8mg of oral dexamethasone (16 tablets of 0.5mg Decadron MSD, Mark Sharp & Dhome Of Pakistan Ltd.) one hour before surgery with plain water. In multi dose (MD) group, patient who had received 8 mg dexamethasone preoperatively continued to take 4mg of dexamethasone (8tablets Decadron 0.5mg) on 24 hours (POD1) and 2mg (4tablets) on 48hours (POD2).

Pre & post operative cheek swelling was recorded clinically from the outer skin surface while teeth in normal intercuspation using a modification of tap measurement method described by Gabka and Matsumara (1971). For recording measurements patients were seated on dental chair positioned at zero and the head was stabilized with the head rest of dental chair and patient was instructed to look straight to head light of dental unit fixed at a level for each patient at one meter distance. Four unwashable facial control points were marked with waterproof markers, so that to maintain their existence for one-week period thus minimizing errors caused by slight variation in the height of patients head. The control points were marked on outer canthus of the eye, angle of the mandible, lower border (front corner) of lobule of the ear and phogonian on operated side and were named CA (canthus to angle) and LP (Lobule to phogonian). The measurements of the two distances, i.e, CA and LP in two dimensions were obtained pre operately, on POD1 (24 hrs), POD2 (48 hrs) and POD7 with an adhesive non elastic transparent tap (sticking tape) and the transparent sticking tape after removal from patients skin surface was remeasured on a smooth surface with a normal tape strip marked up to 20 centimeters and the result were calculated by means of the two measurements, i.e, LP and CA from 60 patients who have completed all stages of study properly. The swelling was classified in the following manner:

1 No swelling (NS)  
2 Mild swelling less than 1/2 cm in size  
3 Moderate swelling 1/2 cm and less than 1 cm  
4 Severe swelling of 1 cm or more in size

RESULTS

Out of seventy-five patients, fifteen (20%) were excluded from the study.

Approximately 75% of postoperative measurements had returned to the preoperative values by POD7 in control group, which is in contrast with 100% in Active Medication (SD & MD) groups.

The results of this study showed no difference in development of post operative swelling between control and SD groups on POD 1 although 10 % difference was noted between control and MD group as well as SD and MD groups. Again no difference between control and SD group was found on POD 2, however, 15% difference was noted between control and MD and SD to MD respectively.

Regarding the mild degree of swelling 30% reduction in swelling has been noted between control and SD groups, 15% between SD an MD groups on POD 1.While on POD2 the difference between Controls to SD group was 55% and control to MD was 50% and the two medication groups differ only 5%. This is not significant. On POD7 no difference between control, SD and MD groups has been noted.

Regarding the moderate degree of post operative swelling the results of our study are encouraging for using oral dexamethasone after impacted mandibular third molar surgery, because with active medication we have found 45% reduction in the degree of swelling between control and SD and 55% between control and MD group on POD2 (48 hrs) when postoperative swelling normally maximized. However, the difference between SD and MD remains only 10%, which is not significant.

The severe degree of swelling was not assessable in this study, because only 2 patients (10%) of control group developed severe swelling on POD2. (Tab-1, Graph-1)
TABLE I: DISTRIBUTION SHOWING NUMBER OF PATIENTS FOR DIFFERENT DEGREES OF SWELLING AFTER SURGICAL REMOVAL OF IMPACTED MANDIBULAR THIRD MOLAR SURGERY. n=60

<table>
<thead>
<tr>
<th>S. No</th>
<th>Total No. of patients</th>
<th>Study Group</th>
<th>Degree of swelling POD1</th>
<th>Degree of swelling POD2</th>
<th>Degree of swelling POD7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>ns</td>
<td>mi</td>
<td>mod</td>
</tr>
<tr>
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<td>20</td>
<td>Control</td>
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<td>11</td>
<td>9</td>
</tr>
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<td>3</td>
</tr>
<tr>
<td>3</td>
<td>20</td>
<td>Multi dose</td>
<td>2</td>
<td>14</td>
<td>4</td>
</tr>
</tbody>
</table>

DISCUSSION

Mandibular third molars are of clinical interest, from the time they are formed until they are removed. These teeth account for 98% of all impactions, as they are the last teeth of the permanent series to erupt. The management of impacted third molars is a complicated procedure involving soft issues, muscle and some of the hardest bone in the skeleton. The access to the site of operation is difficult; the field is highly vascular and constantly flooded with saliva. Pain and edema are normally considered unavoidable consequences of third molar surgery, but unnecessary postoperative swelling may cause facial asymmetry, marked trismus and unbearable pain, therefore all reasonable steps should be taken to minimize these consequences. Steroids undoubtedly decreased postoperative swelling, though several studies have shown the efficacy of steroid in the reduction of postoperative swelling following third molar surgery, but the selection of appropriate drug, its proper dosage and route of administration is still discussable. A fluorinated steroid such as dexamethasone is an excellent synthetic corticosteroid having very high anti-inflammatory activity, long duration of action, no mineralocorticoid potency and a long biological half life. It acts by inhibiting phospholipase A2. Corticosteroid also reduced edema by decreasing permeability of capillary endothelium and therefore reduced the amount of fluid, protein, macrophages and other inflammatory cells entering areas of tissue injury.

The study assessed different degrees of swelling following mandibular third molar surgery in a large group of patients. We used standard methods to evaluate the efficacy of only a preoperative single dose (8 mg) of oral dexamethasone one hour before operation against 8 mg pre and two post operative doses, 4 mg on POD1 (24 hrs) and 2 mg on POD2 (48 hrs) respectively. The most significant aspects of the study are the evaluation of different degrees of swelling such as mild, moderate and severe. Beside this we also modified the tape measure method in order to achieve accurate measurements of facial swelling and patients were seen pre-operatively, on POD1, POD2 and POD7 respectively.
The results of the study showed 45-55% reduction in post operative swelling following third molar surgery between control and two medication groups specially on POD2 when swelling was maximized. In our study 75% or more of measurements had returned to the preoperative values by POD7, in control group as compared to 0% in two medication groups. According to the results we achieved that oral dexamethasone is effective for (45-55%) reduction in postoperative swelling after mandibular third molar surgery especially on POD2 48 hrs. But we are unable to declare any significant difference between the two medication groups, i.e, (SD&MD).

The new millennium brings with it the 50th anniversary of Hench's discovery of 1949. He demonstrated that hydrocortisone might prevent inflammation following oral surgery. Today corticosteroids are used widely in medicine. When properly used corticosteroids are precious in the treatment of inflammation, however the patient's wellbeing may be compromised if the steroids are used haphazardly.

CONCLUSION

It can be concluded from the results of this study that 8mg single preoperative dose of oral dexamethasone can be used safely to reduce the degree of facial swelling up to 45% especially on post operative day 2 in surgical removal of wisdom teeth where swelling is greatly expected. No significant difference (only 10%) in reduction of postoperative swelling was noticed between the two medication groups, i.e, single preoperative dose of 8 mg and pre and post operative doses, i.e, 14 mg, so on the basis of results achieved the use of pre and post operative dose of oral dexamethasone (14mg) is of no significant advantage to patients.

REFERENCES