

## Original Research

### Comparative Assessment of Preoperative versus Postoperative Dexamethasone on Postoperative Complications following Lower Third Molar Surgical Extraction

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#### ABSTRACT:

**Background:** To compare and assess preoperative and postoperative dexamethasone in lower third molar extraction. **Materials & methods:** A total of 20 subjects were enrolled. The subjects were divided into two equal groups receiving 8 mg Dexamethasone orally, one group one hour preoperatively and the other group immediately after surgery. The result was analyzed using SPSS software. Student –t test was done. Chi-square test was used between the two groups. The significance level was set at  $p \leq 0.05$ . **Results:** A total of 20 subjects were enrolled. The mean value in group A and group B for maximum mouth opening at baseline was 45.4. In group B, the mean value at 7<sup>th</sup> day was 43.7. In both the groups, the difference at baseline- 7<sup>th</sup> day was -10.2 and -4.8. **Conclusion:** Preoperative Dexamethasone was better as compared to postoperative administration of the same dose concerning edema after lower third molar surgery.

**Keywords:** third molar, extraction, dexamethasone.

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#### INTRODUCTION

The surgical extraction of lower third molars is the most frequent intervention in oral surgery.<sup>1</sup> This procedure is often associated with significant postsurgical sequelae that may have both biological and social impact. Besides severe complications such as dysaesthesia, severe infection, fracture, and dry socket, patients frequently complain of pain, swelling, and limitation in mouth opening (Trismus) throughout the postoperative course due to the inflammatory response following the surgical injury.<sup>2</sup> Trismus, edema, and pain are postoperative events that depend on several factors, mainly related to the difficulty of the surgical procedure, surgical technique employed, and severity of the impaction, although they are often unpredictable. These effects seem to be originated from the postoperative inflammatory response due to the synthesis and release of prostaglandins and other chemical pain mediators by several cells of the phospholipid membrane as a result of the surgical trauma. Although the inflammatory process is necessary for healing, when exacerbated it may cause pain, swelling, and limited mouth opening.<sup>3-5</sup>

Various corticosteroids such as betamethasone, triamcinolone, prednisolone, hydrocortisone, dexamethasone and methylprednisolone are prescribed to control pain, trismus and swelling.<sup>6,7</sup> The results of randomized trials have shown low, short-dose corticosteroid regimens to be safe and effective for reducing postoperative pain. Clinical trials in oral Surgery have also supported the hypothesis that preemptive NSAIDs and corticosteroids are effective in delaying and preventing many postoperative sequelae.<sup>8</sup> Corticosteroids can be administered through different routes. Few reports of corticosteroids given in the region adjacent to the site of operation are available in the literature, and these gave encouraging results as compared with controls. The technique is convenient for the surgeon, as the injection is given in close proximity to the operative field, and for the patient, as the injection is given into an anaesthetized area.<sup>9</sup> Postoperative complications from third molar surgery after the surgical trauma and release of local mediators are well known, with the most common being noninfectious complications such as pain,

inflammation, and locoregional oedema, as well as limited mouth-opening ability with consequent functional restriction that limits speech and mastication. This postoperative course has a significant influence on the life of the patient.<sup>10</sup> Infectious complications in immunocompetent patients are observed in less than 4% of cases and are mainly related to surgical wound infections. Among these complications, the most common appear in the form of abscess or osteitis, with systemic complications (for example, infective endocarditis or an infection of the implanted artificial joint) being rarer.<sup>11</sup> In the case of third molar surgery, the pain is greatest at first, around 3–5 h postextraction, as a result of the increase in pain mediators as the effect of the local anaesthesia used for the surgery wears off.<sup>12</sup> For this reason, studies have been carried out to demonstrate that it is possible to achieve a longer painless postoperative period using long-acting local anaesthetics.<sup>13</sup> Hence, this study was conducted to compare and assess preoperative and postoperative dexamethasone in lower third molar extraction.

## MATERIALS & METHODS

**Table 1: Mean and difference by group of maximum mouth opening and edema.**

|                       | <b>Evaluation/<br/>difference</b> | <b>Group A<br/>mean</b> | <b>Group B<br/>mean</b> | <b>P - value</b> |
|-----------------------|-----------------------------------|-------------------------|-------------------------|------------------|
| Maximum mouth opening | Baseline                          | 45.4                    | 45.4                    | 1.0              |
|                       | 2 <sup>nd</sup> day               | 30.6                    | 35.8                    | 0.5              |
|                       | 7 <sup>th</sup> day               | 44.2                    | 43.7                    | 0.5              |
|                       | Difference                        |                         |                         |                  |
|                       | Baseline – 2 <sup>nd</sup> day    | -33.5                   | -27.9                   | 0.4              |
|                       | Baseline – 7 <sup>th</sup> day    | -10.2                   | -4.8                    | 0.03*            |
| Edema                 | Baseline                          | 9.63                    | 9.56                    | 0.8              |
|                       | 2 <sup>nd</sup> day               | 10.19                   | 10.48                   | 0.3              |
|                       | 7 <sup>th</sup> day               | 9.7                     | 9.8                     | 0.8              |
|                       | Difference                        |                         |                         |                  |
|                       | Baseline- 2 <sup>nd</sup> day     | 4.5                     | 6.2                     | 0.004*           |
|                       | Baseline - 7 <sup>th</sup> day    | 0.4                     | 1.6                     | 0.03*            |

## DISCUSSION

Prevention and management of postoperative consequences following lower third molar surgery are an essential part of the clinical practice; thus, many attempts have been made to reduce these sequelae by using the anti-inflammatory drugs. The anti-inflammatory effects of glucocorticoids are well-documented; however, how exactly the steroid influences inflammation is not completely understood and is a continuing area of investigation. The primary mechanisms are thought to involve suppression of leukocyte and macrophage accumulation at the site of the inflammation and prevention of prostaglandin formation.<sup>14</sup> Hence, this study was conducted to compare and assess preoperative and postoperative dexamethasone in lower third molar extraction.

In the present study, a total of 20 subjects were enrolled. The mean value in group A and group B for maximum mouth opening at baseline was 45.4. In

A total of 20 subjects were enrolled. The subjects were divided into two equal groups receiving 8 mg Dexamethasone orally, one group one hour preoperatively and the other group immediately after surgery. The surgical procedures were carried out under local anesthesia. The duration of the surgery and osteotomy was recorded as the period between the incision and the last suture. The data was collected. The result was analysed using SPSS software. Student –t test was done. Chi-square test was used between the two groups. The significance level was set at  $p \leq 0.05$ .

## RESULTS

A total of 20 subjects were enrolled. The mean value in group A and group B for maximum mouth opening at baseline was 45.4. In group B, the mean value at 7<sup>th</sup> day was 43.7. In both the groups, the difference at baseline- 7<sup>th</sup> day was -10.2 and -4.8. The p- value was 0.03. For edema, through all periods, group B showed statistically significant higher mean% increase in edema measurement than group A (p value, 0.003). The difference between baseline- 7<sup>th</sup> day in both the groups was 0.4 and 1.6.

group B, the mean value at 7<sup>th</sup> day was 43.7. In both the groups, the difference at baseline- 7<sup>th</sup> day was -10.2 and -4.8. A study by Al- Shamiri HM et al, studied that 24 patients were divided into two equal groups receiving 8 mg Dexamethasone orally, one group one hour preoperatively and the other group immediately after surgery. Pain was measured using VAS, edema was measured using a graduated tape between 4 fixed points in the face, and the mouth opening was measured using a graduated sliding caliper. Pain and trismus records were similar and statistically nonsignificant in both groups. The results had proven that preoperative administration was superior when compared to postoperative administration regarding edema (0.002).<sup>15</sup>

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The difference between baseline- 7<sup>th</sup>day in both the groups was 0.4 and 1.6. Another study by Srivastava N et al, study was carried out on 20 patients who reported to the department of Oral and Maxillofacial surgery, Sri Rajiv Gandhi College of Dental Sciences and Hospital Bangalore, requiring surgical removal of bilateral mandibular third molars. The efficacy of corticosteroid was evaluated based on its ability to reduce pain, swelling and trismus following the surgical extraction of impacted lower third molars. There was no statistical difference between the two steroids with both of them achieving equal level of pain control. There was a statistically significant difference on the second postoperative day with dexamethasone showing clinically superior result. The difference in oral aperture was found to be statistically significant with dexamethasone showing a decreased reduction in postoperative mouth opening on both second and seventh day.<sup>16</sup> Acute postoperative pain following third molar surgery is predominantly a consequence of inflammation caused by tissue injury.<sup>17</sup> Its course depends on the degree of surgical trauma suffered, the need for bone tissue removal, and the extension of periosteum displacement.<sup>18</sup> Inflammatory complications after third molar surgery still remain an important factor in quality of life of patients at the early postoperative periods.<sup>19</sup> Oral surgeons should be aware of the different modalities of alleviation of these complications to make postoperative recovery more comfortable for patient.

## CONCLUSION

Preoperative oral administration of 8 mg Dexamethasone was better to the postoperative administration of the same dose concerning edema after lower third molar surgery.

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