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Effect of dexamethasone on postoperative swelling in patients undergoing impacted molar surgery

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Abstract

Background: The present study was undertaken for comparing the therapeutic effects of Dexamethasone administered intramuscularly pre-operatively vs. post operatively after the surgical extraction of impacted mandibular third molars.

Materials and methods: A total of 40 participants were enrolled. Complete demographic and clinical details of all the patients were obtained. Clinical examination was carried out of all the subjects. Only those patients were enrolled which were scheduled to undergo impacted third molar extraction. All the subjects were randomly divided into two study groups with 20 participants in each group as follows:

Group A: Administration of intramuscular Dexamethasone pre-operatively.

Group B: Administration of intramuscular Dexamethasone post-operatively. All the surgical procedures were carried out by the hands of skilled and experienced oral surgeons. Routine post-operative home care instruction was given to all the patients along with antibiotic coverage. Patients were recalled on the 7th day and sutures were removed. Clinical examination was done. Data was analyzed by using SPSS software.

Results: Mean swelling among patients of group A at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.1 cm, 12.5 cm, 12.9 cm and 11.5 cm respectively. Mean swelling among patients of group B at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.5 cm, 14.8 cm, 15.1 cm and 11.3 cm respectively. Statistically significant difference was obtained while comparing the mean postoperative swelling among patients of group A and group B.

Conclusion: Better post-operative therapeutic effects are achieved by pre-operative administration of intramuscular injection of dexamethasone as compared to post-surgical administration in impacted third molar surgeries.

Keywords: Dexamethasone, impacted, molar

Introduction

Third molar eruption and continuous positional changes after eruption can be related not only with race but also with nature of the diet, the intensity of the use of the masticatory apparatus and possibly due to genetic background [1]. The third molar impaction is occurring in about 73% of the young adults in Europe, these teeth generally erupt between the ages of 17 and 21 years. It has also been reported that the third molar eruption varies with races, such as in Nigeria mandibular third molars may erupt as early as 14 years and in Europe it may erupt up to the age of 26 years. Factors such as the nature of the diet that may lead to attrition, reduced mesiodistal crown diameter, degree of use of the masticatory apparatus and genetic inheritance also affect the timing of third molar eruption. Most of the researchers suggest that the females have a higher incidence of mandibular third molar impaction when compared to males [2-5].

The surgical procedure to extract the wisdom teeth accompanies the post-operative complications like pain, swelling, trismus, bruising, and difficulty in chewing and swallowing. In the past, various techniques and medications have been used to improve the quality of life of the patient in the post-operative recovery period and to minimize the adverse effects of the surgery. Corticosteroids have proven to be the most effective. Corticosteroids are natural steroid hormones that are produced in the adrenal cortex of vertebrates. Corticosteroids have potent anti-inflammatory activity, and have been used at different dosages and through various routes of administration to lessen the inflammatory effects of third molar surgical removal. Due to least adverse effects on leukocyte chemotaxis, which is important in inflammation and healing, dexamethasone and methylprednisolone have been extensively used in various oral surgical

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Procedure [6-8]. Dexamethasone has proven itself to be one of the most effective anti-inflammatory agents and this has been a prime reason for its use following the minor and the major surgical procedures in the field of oral and maxillofacial surgery across the globe in the last 3-4 decades [9]. Hence, the present study was undertaken for comparing the therapeutic effects of 8 mg Dexamethasone administered intramuscularly pre-operatively vs. post operatively after the surgical extraction of impacted mandibular third molars.

Materials and Methods

A total of 40 participants were enrolled. Complete demographic and clinical details of all the patients were obtained. Clinical examination was carried out of all the subjects. Only those patients were enrolled which were scheduled to undergo impacted third molar extraction. All the subjects were randomly divided into two study groups with 20 participants in each group as follows:

Group A: Administration of Intramuscular Dexamethasone Pre-operatively.

Group B: Administration of Intramuscular Dexamethasone Post-operatively.

All the surgical procedures were carried under the hands of skilled and experienced oral surgeons. Routine post-operative home care instruction was given to all the patients along with antibiotic coverage. Patients were recalled on the 7th day and sutures were removed. Clinical examination was done. Data was analyzed by using SPSS software.

Results

Mean age among patients of group A and group B was 29.8 years and 28.1 years respectively. Mean swelling among patients of group A at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.1 cm, 12.5 cm, 12.9 cm and 11.5 cm respectively. Mean swelling among patients of group B at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.5 cm, 14.8 cm, 15.1 cm and 11.3 cm respectively. Significant results were obtained while comparing the mean postoperative swelling among patients of group A and group B.

Table 1: Descriptive results of age (years)

Age (years)	Group A	Group B
Mean	29.8	28.1
SD	3.1	2.3

Table 2: Descriptive statistics for swelling (cm)

Swelling	Group A	Group B	P- value
Pre-operative swelling (cm)	13.1	13.5	0.32
Post-operative 1 st day swelling (cm)	12.5	14.8	0.00*
Post-operative 3 rd day swelling (cm)	12.9	15.1	0.00*
Post-operative 7 th day swelling (cm)	11.5	11.3	0.11

*: Significant

Discussion

The ideal moment to determine whether or not to remove third molars is also under debate, since impaction prediction has not been scientifically proven. Moreover, it is a daunting task to predict this biological condition with any degree of reliability. Systematic reviews report that there is no evidence to support or refute prophylactic removal of asymptomatic impacted third molars, even in adults. These systematic reviews contraindicate the prophylactic removal of third molars in order to prevent late

lower anterior crowding. However, in comparing the opinion of orthodontists and oral and maxillofacial surgeons, it became clear that the latter indicate prophylactic removal of third molars to prevent crowding more often than the former [7-9]. Whenever indicating extraction of third molars, dentists should have a justifiable reason, one that takes into account future treatment planning from an orthodontic, surgical, periodontal and/or prosthetic point of view. At the same time, a cost/benefit analysis should be carried out to justify the prophylactic removal of third molars, which should only be indicated with the purpose of preventing cases that involve pathological processes, such as root resorption or caries in second molars, cysts and pericoronitis [10, 11]. Hence, the present study was undertaken for comparing the therapeutic effects of 8 mg Dexamethasone administered intramuscularly pre-operatively vs. post operatively after the surgical extraction of impacted mandibular third molars.

Mean swelling among patients of group A at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.1 cm, 12.5 cm, 12.9 cm and 11.5 cm respectively. Mean swelling among patients of group B at immediate postoperative period, postoperative 1st day, postoperative 3rd day and postoperative 7th day was 13.5 cm, 14.8 cm, 15.1 cm and 11.3 cm respectively. Significant results were obtained while comparing the mean postoperative swelling among patients of group A and group B. Our results were in concordance with the results obtained by previous authors who also reported similar findings. Jamal AM *et al.* evaluated the effect of prophylactic Dexamethasone administration on facial swelling and trismus after surgical extraction of impacted third molars. 20 patients were included in this study, they were randomly divided into 2 groups of 10 patients each; a study group in which patients were given 8 mg. Dexamethasone 1 hour before surgical extraction of impacted third molar and 4 mg. 6 hours postoperatively, and a control group in which no drug was given, mouth opening and direct facial measurements were done preoperatively and 2 days postoperatively, data were collected and analysed. The study group showed less facial swelling and trismus postoperatively, in facial swelling the difference was statistically significant, while for trismus the difference was not significant. Prophylactic administration of Dexamethasone reduces facial swelling and trismus after surgical extraction of impacted third molars [11]. Lateef TA *et al.* evaluated the effect of prophylactic Dexamethasone administration on facial swelling and trismus after surgical extraction of impacted third molars. 20 patients were included in this study, they were randomly divided into 2 groups of 10 patients each; a study group in which patients were given 8 mg. Dexamethasone 1 hour before surgical extraction of impacted third molar and 4 mg. 6 hours postoperatively, and a control group in which no drug was given, mouth opening and direct facial measurements were done preoperatively and 2 days postoperatively, data were collected and analyzed. The study group showed less facial swelling and trismus postoperatively, in facial swelling the difference was statistically significant, while for trismus the difference was not significant. Prophylactic administration of Dexamethasone reduces facial swelling and trismus after surgical extraction of impacted third molars [12].

Conclusion

Better post-operative therapeutic effects are achieved by pre-operative administration of intramuscular injection of dexamethasone as compared to post-surgical administration in impacted third molar surgeries.

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