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Original Article

Assessment of efficacy of two different dosages of Dexamethasone to control postoperative swelling, trismus and pain after the surgical extraction of mandibular third molars: A comparative study

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***ABSTRACT*:**
Background: A surgical trauma in the oral cavity always causes tissue injury characterized by hyperemia, vasodilatation, increased capillary permeability with liquid accumulation in the interstitial space and granulocyte and monocyte migration, due to the increased osmotic pressure in capillaries Hence; we planned the present study to assess and compare the efficacy of two different dosages of dexamethasone, administered as one dose in the preoperative of the surgical third molar surgery. **Materials & Methods:** The present study included evaluation and comparison the efficacy of two different dosages of dexamethasone, administered as one dose in the preoperative of the surgical third molar surgery. A total of 20 patients undergoing extraction of mandibular third molar were included in the present study and were broadly divided into two study groups; Group A- included subjects that were administered 4 mg of preoperative single dose dexamethasone, and Group B- included subjects that administered 8 mg of preoperative single dose dexamethasone. Evaluation of postoperative pain, trismus and swelling was done. All the results were analyzed by SPSS software. **Results:** We didn't observe any significant difference while comparing the amount of anesthesia produced in the two study groups. Significant difference was obtained while comparing the diminishing of inter-incisal distance in the postoperative period in between the two study groups. **Conclusion:** In controlling trismus and welling, 8 mg of dexamethasone was statistically more efficient.
Key words: Dexamethasone, Molar, Swelling

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INTRODUCTION

A surgical trauma in the oral cavity always causes tissue injury characterized by hyperemia, vasodilatation, increased capillary permeability with liquid accumulation in the interstitial space and granulocyte and monocyte migration, due to the increased osmotic pressure in capillaries (Starling law). Edema is the expression of exudates or transudation, and in surgery, probably both the events occur. Transudation in fact is secondary to blood flow slowing (i.e. hyperemia, vasodilatation, stenosis, etc.), while a superimposed infection is responsible for exudates.[1, 2] Postoperative discomfort may be considered a used term that can nevertheless cause misunderstandings due to its ambiguity. This topic is very much debated in the current international literature.[3- 5]
Hence; we planned the present study to assess and compare the efficacy of two different dosages of dexamethasone, administered as one dose in the preoperative of the surgical third molar surgery.

MATERIALS & METHODS

The present study was planned in the department of oral surgery of the dental institute and it included evaluation and comparison the efficacy of two different dosages of dexamethasone, administered as one dose in the preoperative of the surgical third molar surgery. A total of 20 patients undergoing extraction of mandibular third molar were included in the present study and were broadly divided into two study groups; Group A- included subjects that were administered 4 mg of preoperative single dose dexamethasone, and Group B- included subjects that administered 8 mg of preoperative single dose dexamethasone. Exclusion criteria for the patients in the present study included:

- Patients with any systemic illness,

- Patients with any known drug allergy,
- Patients on any form of immunosuppressant therapy
- Patients less than 20 years of age

All the patients underwent surgical removal of mandibular third molar under local anaesthesia. After the commencement of surgical procedure, Paracetamol 750 mg; 1 tablet every 6 hours for 4 days, was prescribed. Visual analog scale (VAS) of 10 mm was used for evaluation of pain in the postoperative period. Swelling was evaluated using horizontal and vertical guide with a flexible ruler and a Vernier caliper following control points.[6]

Evaluation of facial postoperative swelling was done postoperatively after 24 hours and 48 hours. All the results were analyzed by SPSS software. Chi-square test and student t test were used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

In the present, we evaluated a total of 20 patients and were broadly divided into two study groups; group A included patients that were administered with 4 mg of dexamethasone and group B that were administered with 8 mg of . In the present study, we didn't observe any significant difference while comparing the amount of anesthesia produced in the two study groups. Significant difference was obtained while comparing the diminishing of inter-incisal distance in the postoperative period in between the two study groups.

Table 1: Comparison of results

Measures	Time	Dosage		P-value
		4 mg	8 mg	
Angle – ear tragus	Preoperative	50.25	51.42	0.55
	24 hour postoperative	52.15	53.25	
	48 hour postoperatively	52.55	54.22	
Angle – buccal commissure	Preoperative	79.15	80.11	0.47
	24 hour postoperative	80.52	81.54	
	48 hour postoperatively	81.45	82.28	
Inter-incisal distance	Preoperative	46.41	48.44	0.01*
	24 hour postoperative	29.14	38.59	
	48 hour postoperatively	26.76	33.77	

*: Significant

DISCUSSION

Corticosteroids are potent anti-inflammatory agents. The cycloxygenase and prostaglandins play a crucial role in development of post-operative pain and swelling. Pain and swelling can be reduced via the membranestabilizing anti exudative effect of glucocorticoids and by inhibiting cycloxygenase with nonsteroidal anti-inflammatory drugs. Corticosteroids have been used in different dosing regimens and administration routes to lessen the inflammatory effects of third molar surgical removal.[7-9]

In the present study, we didn't observe any significant difference while comparing the amount of anesthesia produced in the two study groups. Significant difference was obtained while comparing the diminishing of inter-incisal distance in the postoperative period in between the two study groups. Semper-Hogg W et al evaluated the effect of a preoperative intravenous dexamethasone injection of 40 mg on postoperative swelling and neurosensory disturbances after orthognathic surgery. From the results, the authors concluded that patients undergoing orthognathic surgery should receive a preoperative injection of dexamethasone in order to control and reduce edema.[10]

Latt MM et al investigated the effectiveness of preoperative injection of a single dose of 8 mg dexamethasone for postoperative pain control in lower third molar surgery. Injection of 8 mg dexamethasone into the pterygomandibular space effectively reduced the postoperative pain and other postoperative sequalae.[11]

Agostinho CN et al addressed the effect of 2 different concentrations (4 and 12 mg) of dexamethasone to control pain, swelling, and trismus after third molar surgery. A statistical analysis of the results showed no significant differences ($\alpha = 0.05$) between the analyzed variables for the 2 doses of dexamethasone (4 and 12 mg).[12] Beirne OR compared preoperative steroids (in any formulation, dose or route) with placebo or no treatment in patients of any age, having extraction of one or more impacted third molars (under local or general anaesthesia or with intravenous sedation). The use of corticosteroids in third molar extractions reduces the degree of trismus and inflammation. Parenteral administration seems to be more effective than oral administration as does taking the corticosteroids before rather than after surgery.[13]

Shah SA et al evaluated the effect of submucosal dexamethasone injection to control postoperative pain and swelling in apicectomy of maxillary anterior teeth. Submucosal dexamethasone 4mg injection is an effective therapeutic strategy for swift and comfortable improvement after surgical procedure and has a significant effect on reducing postoperative pain and swelling.[14]

In the studies examined, dexamethasone has been administered in the submucosa orally, IM and IV, whereas methylprednisolone has been administered orally, IM in the masseteric muscle and IV. However, results obtained cannot be compared as, although studies often had an internal control, as they analyzed in the same patient, in independent excisions, treatment versus no pharmacological intervention, the timing, dosage and route of administration differed in independent studies. In some cases, a single pre-operative administration has been adopted, whereas in others, the treatment has been administered before and after surgery or associated with antibiotics after surgery. In all these studies, positive results were obtained, confirming the general anti-inflammatory properties of corticosteroids irrespective of specific compound, dosage and timing. The immediate postoperative endoalveolar or submucosal administration of dexamethasone produces a beneficial effect in

preventing inflammatory sequelae of lower wisdom tooth removal. In particular, the topical application of 4 mg dexamethasone gave rise to less edema and trismus, and lower patient pain perception after both 2 and 7 days of the surgical removal.[15- 17]

CONCLUSION

Under the light of above mentioned data, the authors conclude that in controlling trismus and welling, 8 mg of dexamethasone was statistically more efficient. However; future studies are directed.

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