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A COMPARATIVE EVALUATION OF METHYLPREDNISOLONE AND DEXAMETHASONE INJECTED INTO THE MASSETER MUSCLE IN SURGICAL REMOVAL OF IMPACTED LOWER THIRD MOLARS

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ABSTRACT

This study is to compare the efficacy of methylprednisolone, as a single 40mg dose and Dexamethasone, as a single 4mg dose injected into masseter muscle prior to placement of incisions. A prospective randomized study comprising 10 patients undergoing elective Bilateral Impacted lower third molar surgery with similar severity index were randomly assigned into Group I who received a single dose of methylprednisolone 40 mg injected into masseter muscle through intrabuccal approach and group II who received a single dose of Dexamethasone, as a single 4mg injected into masseter muscle through intrabuccal approach after Inferior alveolar nerve and long buccal nerve block. Steroidal Injections were given prior to the surgical removal of the impacted lower third molars. The inclusion criteria were: healthy patients aged over 18 years of either sex and without contraindication for corticosteroids. Ten patients were selected for the study. The mean age was 24 years (SD 5). Males were 56% than females 48%. The evaluation of postoperative pain, trismus, swelling and swallowing is made using the parameters: Interincisal distance to measure the mouth opening, assessment of swelling by measuring - tragus-lip commissure, Gonion-lip commissure and Gonion-outer canthus of the eye, preoperatively, second and seventh day postoperatively. Pain and swallowing assessed by using VAS on a 1-10 scales for every hour for six hours after surgery and during the next three days once in morning and night. No difference between the Methylprednisolone and Dexamethasone injected into the masseter muscle in surgical removal of impacted lower third molars.

INTRODUCTION

The use of steroids in surgical removal of impacted lower third molars to reduce the post operative pain and swelling is broadly studied topic¹. Spies *et al*² and Streaan & Horton³ used hydrocortisone to reduce the postoperative inflammation. In oral surgery dexamethasone and methylprednisolone are more commonly used glucocorticoids¹. The effect of glucocorticoids is well known and widely used to reduce swelling associated with the surgical removal of impacted third molars^{4,5,6,7}. Glucocorticoids inhibit synthesis and release of inflammatory mediators⁸ and decrease the fluid transudation and oedema^{9,10,11}. Delayed wound healing and susceptibility to

infection are not clinically significant with a shorter course of treatment.

The present study involves in comparison of injection of a single 40 mg dose of methylprednisolone and a single 4mg dose of dexamethasone into masseter muscle via a intrabuccal approach prior to placing incision for the surgical removal of bilateral impacted third molars under local anesthesia.

MATERIALS AND METHODS

This study conducted from May 2010 to March 2011 comprising of 10 patients. A prospective randomized study with the inclusion criteria were Healthy patients with ASA I and no

contraindication for corticosteroids. Bilateral impacted lower third molars with similar difficulty index. Both the sex groups with aged over 18 years were included. Orthophantomogram showed the position of the teeth to be symmetrical. All patients required tooth section to remove it. Informed consent was obtained.

Group I who received a single dose of methylprednisolone 40 mg injected into masseter muscle through intrabuccal approach and group II who received a single dose of Dexamethasone, as a single 4mg injected into masseter muscle through intrabuccal approach. Both the groups' received steroidal injections after injecting inferior alveolar nerve block and buccal nerve block and before placing the incision. After completion of the procedure the patients rated pain on a 100-mm visual analog scale, zero represent 'no pain' and hundred represents 'worst pain'. Assessment of pain was done every hour for the first six hours of the completion of the treatment on that day, and then twelve hour intervals for next three days.

Mouth opening was measured with caprovich calipers, and postoperative swelling were evaluated by measuring the distance between tragus-lip commissure, gonion-lip commissure and

gonion-external canthus of the eye using silk thread before and two days after surgery. The student's t-test was used to compare the means.

RESULTS

Of the 12 patients selected for the study two were excluded because of failure to review. The mean age was 24 years (SD 5). Males were 56% than females 48%. The preoperative data of mouth opening and facial swelling are presented in table 2. The postoperative data of mean pain intensity score, mouth opening and facial swelling are shown in table 1, 3 and 4 respectively. There was no difference between two groups in preoperative measurement.

There were no statistical difference in facial swelling; mouth opening and pain score in the two groups, the group I who received a single dose of methylprednisolone 40 mg injected into masseter muscle through intrabuccal approach and the group II who received a single dose of Dexamethasone, as a single 4mg injected into masseter muscle through intrabuccal approach.

Table 1: Postoperative pain scores

	Day 0	Day one		Day two		Day three	
	Six hours	Morning	Night	Morning	Night	Morning	Night
Methylprednisolone (Group I)	12.45	9.23	12.02	10.76	12.24	10.67	9.29
Dexamethasone injection (Group II)	12.67	9.67	12.78	11.14	13.07	11.56	9.73
Difference of mean (group I-group II)	- 0.22	- 0.44	- 0.76	- 0.38	- 0.83	- 0.89	- 0.44
SD	0.38	0.59	0.54	0.63	0.56	0.85	0.55
P	0.533	0.081	0.104	0.126	0.183	0.054	0.092

Table 2: Mouth opening and facial swelling – preoperatively

	Mouth opening	Tragus-commissure	Gonion-commissure	Gonion-external canthus
Methylprednisolone (Group 1) mm	44.33	102.84	91.56	105.33
Dexamethasone injection (Group 2) mm	43.76	103.54	92.44	106.28
P value	0.096	0.235	0.364	0.270

Table 3: Mouth opening and facial swelling 2 days postoperatively

	Mouth opening	Tragus-commissure	Gonion-commissure	Gonion-external canthus
Methylprednisolone (group 1)	33.33	106.94	96.75	108.42
Dexamethasone injection (group 2)	32.76	107.89	97.14	109.36
SD	0.67	0.43	0.61	0.66
P value	0.096	0.410	0.364	0.207

Table 4: Mouth opening and facial swelling 7 days postoperatively

	Mouth opening	Tragus-commissure	Gonion-commissure	Gonion-external canthus
Methylprednisolone (group 1)	40.16	103.94	92.32	105.82
Dexamethasone injection (group 2)	39.72	104.06	93.04	107.16
SD	2.21	1.19	0.57	1.85
P value	0.635	0.816	0.171	0.185

DISCUSSION

The corticosteroids reduces facial swelling, pain and trismus, they are generally injected before or after the surgical removal of impacted teeth or any other surgery. The half life of Methylprednisolone is 18 to 36 hours and more potent than hydrocortisone^{5,9,12,13,14} and has no minerlocorticoid activity¹⁵ and the Methylprednisolone has been studied in most of studies because the drug is five times more potent than hydrocortisone^{5, 14}.

Micro-Lorenz *et al*¹⁶ injected 40 mg methylprednisolone into the gluteal region following the removal of impacted third molars showed good result. Esen *et al* used a single intravenous of 125 mg of methylprednisolone reduces the swelling, pain and trismus associated with third molar surgery. Dexamethasone injected into the masseter muscle showed decrease in pain, swelling and trismus by Messer & Keller¹⁰. Methylprednisolone injection decrease the postoperative pain was reported by Esen *et al*¹⁷ similarly using dexamethasone significant decrease in pain after surgery reported by Baxendale¹⁸. Use of non-steroidal anti - inflammatory drugs were compared with methylprednisolone in relation to pain, edema and trismus as common complication following

surgical removal of impacted third molars which showed non-steroidal anti - inflammatory drugs have more initial analgesic effect than methylprednisolone but the latter have more anti-edema effect¹⁴.

In this study the comparison between methylprednisolone 40 mg and 4mg dose of dexamethasone was injected into masseter through intrabuccal approach after anesthetizing inferior alveolar, lingual and buccal nerve and before placing the incision in surgical removal of impacted lower third molar. The evaluations of postoperative pain, trismus, swelling and swallowing were made.

CONCLUSION

This study show there is no significant difference were present between Intrabuccal approach massetric injection of a single 40 mg dose of methylprednisolone and a single 4mg dose of Dexamethasone in means of pain, swelling and trismus following surgical removal of impacted lower third molars but this study of 10 cases was quantitatively very minimal and needs to be undertaken with larger samples to substantiate the findings.

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