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Comparison of efficacy of dexamethasone injection into masseter and gluteal region for the management of pain, swelling and trismus after mandibular third molar surgery

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Abstract

Background and Aim: Third molar tooth surgery are most common oral surgical procedure. But post-operatively symptomatic pain, swelling and trismus may develop. Various medication use for reduction of these complications such as Non-steroidal anti-inflammatory drugs and Steroidal anti-inflammatory. In our study we use dexamethasone, aim of our study to compared the efficacy of dexamethasone injected into masseter region via intrabuccal approach and gluteal region after third molar extraction to evaluate post-operative swelling and trismus.

Material and Methods: Study population consisted of 60 patients those required removal of impacted mandibular third molar teeth. Randomly sample divided in to three group, group I Injection of dexamethasone was given into masseter muscle preoperatively. Group II Injection of dexamethasone was given into gluteal muscle preoperatively and Group III No dexamethasone injection was given preoperatively. We used Dexamethasone sodium phosphate (Dexona) (4 mg), 1 cc of injection. Access the pre and post-operative facial swelling and mouth opening.

Results: Group I pre-operatively mouth opening was 4.47, 7th day 4.47. Group II pre-operatively mouth opening was 4.26, 7th day 4.24. Group III pre-operatively mouth opening was 4.52, 7th day 4.44. Group I pre-operatively mean value of Point A was 11.490, For Point B pre-operatively mean value was 14.945.Group II pre-operatively mean value of Point A was 11.220, For Point B pre-operatively mean value was 14.895.Group III pre-operatively mean value of Point A was 11.965, For Point B pre-operatively mean value was 15.505.

Conclusion: We conclude that single intramasseteric injection of 4mg dexamethasone reduce the post-operative swelling, pain and trismus.

Clinical Significance: 4mg Injection of Dexamethasone in intramasseteric region definitely help to reduce post-operative discomfort like pain, swelling and trismus in mandibular third molar surgery.

Keywords: Dexamethasone, Masseter, Mandibular Third Molar, Pain, Swelling, Trismus.

Background and Aims:

In the dentistry, third molar surgery is regular and most common surgical procedure. Routinely we encountered post-operative symptomatic pain, swelling and reduction in mouth opening (trismus) after surgical removal of third molar tooth[1]. Various methods use for reduction of post-operative swelling, pain and trismus most frequently use in oral surgery is Dexamethasone because of its high potency and long half-life. Few author use the injection of a single dose of methylprednisolone (40mg) into the masseter muscle via the intrabuccal approach following the surgical extraction of impacted lower third molars under local anaesthesia[2]to access the efficacy of methylprednisolone in controlling typical postoperative trismus and swelling. In our study, we used dexamethasone. In the present study we compared the efficacy of dexamethasone injected into masseter region via intrabuccal approach and gluteal region after third molar extraction to evaluate post-operative swelling and trismus.

Materials and Methods

Study population consisted of 60 patients those required removal of impacted mandibular third molar teeth. Randomly sample divided in to three group, group I Injection of dexamethasone was given into masseter muscle preoperatively. Group II Injection of dexamethasone was given into gluteal muscle preoperatively and Group III No dexamethasone injection was given preoperatively. We used Dexamethasone sodium phosphate (Dexona) (4 mg), 1 cc of injection. Pre-operatively facial measurement was taken to access post-operative the facial swelling and trismus. For swelling, measurement was taken by marking two fixed point, point A Tragus to mouth commissure, point B tragus to soft tissue pogonion to measure the extent of swelling preoperatively and postoperatively in closed mouth position. Postoperative measurements were done on 2nd and 7th day. For mouth opening, interincisal distance was measured in centimeters with the help of divider and a 12 inch scale between maxillary and mandibular central incisors during maximum mouth opening.

Results

A sample of 60 patients was divided into three groups (each of 20). Group I is Intramasseteric injection of dexamethasone, Group II is intragluteal injection of dexamethasone, Group III is control group where no dexamethasone was given.

In Group I pre-operatively mean value of Point A was 11.490, 2nd post op day 11.505 and 7th day 11.490. For Point B pre-operatively mean value was 14.945, 2nd post op day 15.115 and 7th day 14.965.In Group II pre-operatively mean value of Point A was 11.220, 2nd post op day 11.330 and 7th day 11.220. For Point B pre-operatively mean value was 14.895 2nd post op day 15.205 and 7th day 14.930.In Group III pre-operatively mean value of Point A was 11.965, 2nd post op day 12.185 and 7th day 11.970. For Point B pre-operatively mean value was 15.505, 2nd post op day 16.000 and 7th day 15.700.

In Group I pre-operatively mouth opening was 4.47, 2nd post op day 4.29 and 7th day 4.47. In Group II pre-operatively mouth opening was 4.26, 2nd post op day 3.72 and 7th day 4.24. In Group III pre-operatively

mouth opening was 4.52, 2nd post op day 3.95 and 7th day 4.44.

Discussion

The surgical removal of impacted third molar tooth have few post-operative discomfort in means of trismus, pain, and swelling. To reduce this discomfort routinely prescribe anti-inflammatory drugs such as steroidal and non-steroidal anti-inflammatory drugs.

Non-steroidal anti-inflammatory drugs such as ibuprofen, flubiprofen and fenbrufen have been used to reduce edema, pain and trismus by inhibiting prostaglandin synthesis. These drugs suppress the post-operative pain without prominent anti-inflammatory properties[3].

Steroidal anti-inflammatory drug such as, Dexamethasone has a longer duration of action than methylprednisolone and is considered more potent.Glucocorticoids exert their action at virtually every step in the inflammatory process, which leads to decreased capillary dilatation, decreasing circulating lymphocytes, inhibiting fibroblast proliferation, and inhibiting prostaglandins and leukotrienes. The suppression of these factors exerts a profound effect on tissue inflammation and thus offers a potent therapeutic tool in managing patient postoperatively[4, 7].Steroids can be given in the form of a single dose intramuscular, intravenous injection or simply in the form of tablets.

In 1975, the intramasseteric injection after completion of the extraction of the third molar was described by J Messer and J Kellar. There was a predictable decrease in edema, amount of trismus and pain in comparison with patients who did not receive dexamethasone[5, 6].

Markiewicz MR, Brady MF and Ding EL et al described use of corticosteroids. The primary predictor variable was perioperative corticosteroid exposure. The 3 outcome variables were edema, trismus, and pain assessed during the early 1-3 days and late 3 days postoperative time periods. They found that perioperative administration of corticosteroids produces a mild to moderate reduction in edema and improvement in range of motion after M3 removal[4].

We also used dexamethasone injection at intramessetric region, gluteal region to access the efficacy as anti-inflammatory effect for reduction in post-operative swelling, pain and trismus.

Annepederson in his investigation concluded that dexamethasone 4 mg injected into the masseter muscle reduces swelling and trismus after removal of impacted wisdom tooth.Intramasseteric injection have the advantage of having the drug acting locally and exert its action powerfully.

In our study we noticed that, on 2nd and 7th post-operative day there were significantly reduction in swelling and trismus on intramessetric group as compare to gluteal region and control group.

Conclusion

We conclude that single intramasseteric injection of 4mg dexamethasone reduce the post-operative swelling, pain and trismus as compare to other two groups.

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Legend Tables

Table 1: Mouth Opening

Mouth Opening									
	GROUP	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper bound		
PRE-OP	1	20	4.47	.556	.124	4.21	4.73	4	6
	2	20	4.26	.581	.130	3.98	4.53	3	5
	3	20	4.52	.375	.084	4.34	4.69	4	5
	Total	60	4.41	.516	.067	4.28	4.55	3	6
2^{ND} POST OP	1	20	4.29	.479	.107	4.07	4.51	3	5
	2	20	3.72	.530	.119	3.48	3.97	3	4
	3	20	3.95	.382	.085	3.77	4.12	3	4
	Total	60	3.99	.516	.067	3.85	4.12	3	5
7^{TH} POST OP	1	20	4.47	.556	.124	4.21	4.73	4	6
	2	20	4.24	.570	.127	3.97	4.51	3	5
	3	20	4.44	.363	.081	4.27	4.60	4	5
	Total	60	4.38	.507	.065	4.25	4.51	3	6

1= 1= 1= 1=Masseter Group, 2= Gluteal Group, 3=Control Group

Table 2: Swelling

Group	Swelling Data(Mean Value)					
	Pre-Op		2nd Post Op		7th Post Op	
	Point-A	Point-B	Point-A	Point-B	Point-A	Point-B
1	11.490	14.945	11.505	15.115	11.490	14.965
2	11.220	14.895	11.330	15.205	11.220	14.930
3	11.558	15.505	12.185	16.000	11.970	15.700

1= Masseter Group, 2= Gluteal Group, 3=Control Group