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Research Article

Comparative study for effectiveness of oral dexamethasone for assessment of pain, swelling and trismus following impacted 3rd molar surgery

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Abstract:

Aim: To evaluate the efficacy and post operative effect of Dexamethasone to decreases the swelling and trismus after surgical extraction of mandibular 3rd molars.

Material and method: In this study 294 adult patients underwent surgical extraction lower third molar under local anesthesia at OMFS dept of Update dental college for last 2 years. These patients were divided into two groups. Group-A patients were given post operative orally steroids. Group-B Patients were not given any steroids at the end of the surgical procedure. Evaluation of pain, trismus, swelling preoperatively, 3rd and at 7th days post operative day.

Result: On 7th post-operative day, those who received dexamethasone orally showed better results such as greater reduction of pain, trismus and swelling in compared to those who didn't receive dexamethasone.

Conclusion: This study concludes that, administration of dexamethasone is more effective after surgical extraction to reduce unfavorable swelling, trismus which improves and enhance patients comfort and facial appearance in shorter duration.

***Keywords:** Dexamethasone, Impacted 3rd molars, Swelling, Trismus, Post-operative.*

Introduction

The term "Impacted" means fully form tooth within the bones, but have not fully erupt or not in occlusion or proper functional position in the dental arch or outside of arch.[1] Mandibular impaction is the most common problems people facing on, as because lack of space in mandible to accommodate the fully form erupting teeth or in occlusion.[2]Odontectomy of mandibular 3rd molar is most common surgical procedure in oral and maxillofacial surgery department. Due to surgical intervention of surgery related trauma to the tissue, results in pain, trismus and swelling that can occurs an inflammatory response to the body. This unexpected squeal may impact the patient's quality of life, causes disturbance to the patient after post operative periods. Although inflammatory response is necessary to regulate the process of inflammation and healing.[3] To subside post-surgical inflammation and symptoms, suitable anti-inflammatory therapy is needed.[4] Use of corticosteroids can reduce the severe post operative swelling and extraction related trismus of many patients.[5] Corticosteroids have an action on phospholipid A2 enzyme, which inhibits the release of arachidonic acid and reduces the whole inflammatory process.[6]

Oral dexamethasone is a synthetic anti-inflammatory therapy which widely used due to its prolong half life and high potency and convenient dose. [7]The aim of our study is to see post operative better outcome for those who took oral dexamethasone in tapering dose; reduced swelling, less trismus, adequate mouth opening and less discomfort.

Materials and Methods:

The study was conducted in out patients department of oral and maxillofacial surgery at Update dental college and Hospital, between Jan'18 to Dec'19. Patients were selected from the Dept of Oral and Maxillofacial Surgery. The inclusion criteria for selection of patients were; those who were free from any systemic disease which might have interfered with wound healing, were not taking anti-inflammatory drug for other diseases(e.g. Osteoarthritis), that can obscure the inflammatory response as NSAIDs, steroids and free from any drug allergy. The patients were randomly divided into two groups. In Group –A, dexamethasone was given orally with tapering dose along with antibiotics and analgesics. In Group -B patients were not given any steroids orally but analgesic, antibiotics are given.

A complete medical history was obtained from the patients before surgery and extraoral as well as intraoral examination was done, including orthopantomography to confirm the need for surgical removal of 3rd molar along with difficulties level. They went surgical extractions of mandibular 3rd molars under local anesthesia. All the patients of both group were given antibiotics cefixime or cefuroxime and metronidazole or ornidazole 500mg 8 hourly for 5 days, analgesic ketorolac 10mg or ibuprofen or diclofenac sodium 400mg or tramadol HCl 100 mg 8 hourly for 3 days along with anti ulcerant pantoprazole, omeprazole or rabeprazole 20mg for 12 hourly for 3 days in oral route. They also given povidone iodine 1% mouthwash to be used 5 to 6 times daily after 24 hours of surgery for 7-10 days. Dexamethasone given orally tapering dose in group A patients.

Operative technique:

By blocking inferior alveolar nerve, long buccal nerve and lingual nerve using local anesthesia (2% lignocaine with adrenaline 1:80,000). In standardized technique crevicular with releasing incision was placed and mucoperiosteal flap was reflected. Bone was removed around the tooth with no.701 or no. 702 fissure bur according to necessity with continuous irrigation of normal saline. The crown and roots were sectioned if necessary. After surgical extraction, socket was inspected and copiously irrigated with normal saline. After curettage flap was closed with 3-0 silk. A small gauge pack was applied with surgical site and asked the patient bite on it gently at least 1hour for proper haemostasis and follow up schedule was given. After that post operative instruction was given to the patient. The duration of surgery was recorded.

Assessment and follow up:

After 3rd and 7thpost operative day, assessment of facial swelling, trismus were measured. Facial swelling was evaluated by tape measurement method. 3 planes are using this method. 1st plane was from the tragus of the ear to corner of the mouth, 2nd is from gonion to corner of the mouth, 3rd one is from canthus of the eye to gonion. This measurement was taken when the patient seated on upright position with the teeth is lightly on the occlusion. The facial measurement was repeated on 3rd, 7th day after surgery. Trismus was measured with maximum mouth opening before and after 3rd and 7thpost operative day using stainless steel ruler.

Result:

Among 294 patients mandibular impacted molars, who met the inclusion criteria, 162 were males and132 were females. The age of patients ranged from 17 to 33 yrs. whereas average age was 25 yrs. Total of 294 surgical extractions were done, 147 in Dexamethasone group and 147 in placebo group. At follow-up, no patient after surgery developed any wound infection or serious post-operative complications or drug side effect. All the patients were followed up on the 3rd and 7th postoperative days. Statistical analysis was done by SPSS 20 software, were mean values with standard deviation and one-way analysis by ANOVA test and paired 't' test was used to compare the variables. As in table B shown, significant difference was not statistically noted in pain during the 3rd post-operative day for both the groups. Where, low pain scores were found with the use of Dexamethasone compare to placebo group. Statistically significant differences in all phases of swelling was shown in Dexamethasone group (P = 0.015, 0.005, 0.066, respectively). Mouth opening measurements (millimeter) was converted in percentage for both groups. Mouth opening was improved after surgery in which Dexamethasone was prescribed. Swelling was not sufficiently reduced in all phases in placebo group. While comparing both the groups there is a marked difference in post-operative pain and trismus in preoperative, 3rd day & 7th day. (p<0.05) (Table B).

TABLE-A: Comparison between pain, facial contour and trismus in dexamethasone group.

Dexamethasone	Groups	N	Mean	SD	Paired t	p value
Pain	Preoperative	147	1.94	0.54	1.44	0.143
	3rd POD	147	1.62	1.33		
	Preoperative	147	1.94	0.54	5.344	0
	7th POD	147	0.74	1.24		
	3rd POD	147	1.62	1.33	4.725	0
	7th POD	147	0.74	1.24		
Facial contours	Preoperative	147	12.48	0.6	2.52	0.015
	3rd POD	147	12.22	0.64		
	Preoperative	147	12.48	0.6	2.88	0.005
	7th POD	147	12.1	0.62		
	3rd POD	147	12.22	0.64	0.572	0.066
	7th POD	147	12.1	0.62		
Trismus	Preoperative	147	34.33	10.2	8.644	0
	3rd POD	147	39.88	8.82		
	Preoperative	147	34.33	10.2	13.012	0
	7th POD	147	46.44	9.48		
	3rd POD	147	39.88	8.82	8.12	0
	7th POD	147	46.44	9.48		

TABLE – B: Comparison between pain, facial contour and trismus in placebo group.

Dexamethasone	Groups	N	Mean	SD	Paired t	p value
Pain	Preoperative	147	1.98	0.50	1.924	0.052
	3rd POD	147	2.46	1.68		
	Preoperative	147	1.98	0.50	3.801	0
	7th POD	147	1.28	1.31		
	3rd POD	147	2.46	1.68	7.862	0
	7th POD	147	1.28	1.31		
Facial contours	Preoperative	147	12.24	0.64	0.428	0.668
	3rd POD	147	12.18	0.56		
	Preoperative	147	12.24	0.6	1.004	0.326
	7th POD	147	12.04	0.58		
	3rd POD	147	12.18	0.56	0.538	0.592
	7th POD	147	12.04	0.58		
Trismus	Preoperative	147	29.6	8.12	7.424	0
	3rd POD	147	36.62	8.44		
	Preoperative	147	29.6	8.12	10.946	0
	7th POD	147	44.88	10.33		
	3rd POD	147	36.62	8.44	7.684	0
	7th POD	147	44.88	10.33		

Discussion:

In our study, group-A is subjected to received post operative anti-inflammatory drug orally as well oral steroids and group-B subjected to receive no post-operative steroids only analgesic. Effect of corticosteroids can minimize the swelling, pain and trismus is discussed greatly in the literature. The anti-inflammatory actions of synthetic steroids are well documented. Initially, the mechanism involving suppression of leukocyte and macrophage at the site of post operative inflammation, which prevent prostaglandin synthesis.[8] Prostaglandin are decreased by the interruption of the arachidonic acid. Lipocortin, which is an endogenous protein produced by synthetic steroids, interferes with the activity of phospholipase A2. Thus the influencing the synthesis of prostaglandin, leukotrienes and thromboxane.[9] In this study dexamethasone was chosen due to its high potency, sodium retaining capability and its half life.[10]

Surgical extraction of mandibular 3rd molar causes post operative swelling, thus inflammatory condition is essential for healing. But excessive post operative inflammation can lowers the quality of life of the patient.[11]There are different types and forms of corticosteroids are available which reduces the post surgical inflammation.[12]

Post surgical inflammation is very difficult to measure perfectly, because it involves 3 dimensions of measurement with an irregular, convex surface which manifest itself internally as well as externally. [13]

Edema was seen at a maximum on the 2nd day after 3rd molar surgery in two groups. But swelling was gradually subside 3rd -5thpost operative day who take dexamethasone orally.[14] Trismus was measured in this study in which maximal interincisal opening that is attributed to the swelling, pain associated with post surgical trauma. Restriction of mouth opening can be results in splinting actions of the muscles to reduce discomfort after surgery or due to the inflammation in the muscles of mastication with preventing its flexibility.[15]After 7days mouth opening of Group-A shows more interincisal opening then Group-B. Edema is almost absent in Group-A to Group-B.[16] Acute post operative pain after mandibular 3rd molar surgery results in tissue injury.[17]After 7thpost operative day it was completely subsided on Group-A in comparison to Group-B.

Dexamethasone lowers the post surgical pain in some particulars. But some reduction of post surgical pain generally reduction of swelling, dexamethasone do not have any analgesic effect.[18]

Recent studies shows that different route of administration of dexamethasone provide the better results in post operative periods.[19]The oral route is the most secure and inexpensive route of administration of many patients. It acts early in the inflammatory site, thus decreases the synthesis of inflammatory mediators at the surgical area, so that gradually reduction of swelling occurs, which causes early control of post operative pain and discomfort for the patients.[20, 21] Inflammatory complications after surgical removal of mandibular 3rd molars lowers the quality of life of the patient at early post operative periods.[22] Oral surgeons should be aware of the different modalities to make post surgical recovery more comfortable for the patients.

Conclusion:

Based on study, oral administration of systemic dexamethasone can reduces the post operative inflammatory condition as well as trismus after impacted 3rd molar surgery. Further oral route and injectable form can be compared in large scale to see postoperative swelling and trismus for support findings.

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