



**Research Article**

**A PROSPECTIVE STUDY ON THE EFFECTIVENESS OF TRYPSIN-CHYMOTRYPSIN AND DEXAMETHASONE IN CONTROL OF POST OPERATIVE PAIN, SWELLING AND TRISMUS FOLLOWING SURGICAL REMOVAL OF MANDIBULAR THIRD MOLAR**

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**ABSTRACT**

**Introduction:** Impacted third molar surgery is one of the most common procedures performed by maxillofacial surgeons. It involves the elevation of a soft tissue flap, followed by adequate bone guttering and odontectomy which lead to soft tissue injury initiating process of inflammation. Hence, to minimize the unwanted effects of inflammation, it becomes essential to regulate the process of inflammation. **Objective:** To compare the efficacy of trypsin-chymotrypsin and dexamethasone on post operative pain, swelling and trismus following impacted mandibular third molar removal. **Material and method:** 50 patients divided into 25 eachas Dexamethasone group and chymoral forte group. Dexamethasone 1mg t.i.d. for five days post operatively and Chymoral forte 1:1000000 armour units t.i.d for five days post operatively were prescribed to both groups. The effects of both the drugs on patients were studied using parameters pain, trismus and swelling. Statistics were collected and computed on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> post operative days. **Results:** Sample comprising both groups were clinically analyzed for pain, swelling and trismus using VAS (visual analog scale) for pain, cheek girth and facial measurements for swelling, and inter incisal opening for trismus. **Conclusion:** No statistically significant difference noted between two groups with respect to pain and swelling, however in case of trismus there was a statistically significant difference between the two groups. Clinically patients on dexamethasone had better relief with regards to pain, trismus and swelling when compared to chymoral forte group. Use of Dexamethasone post operatively following surgical removal of mandibular third molar provided better relief with regards to the above parameters.

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**INTRODUCTION**

Surgical removal of impacted third molars is one of the most common procedures performed by maxillofacial surgeons by elevating a flap which causes significant amount of soft tissue injury releasing various chemical mediators of inflammation. [1] These mediators trigger the physiological processes like vasodilatation, vasoconstriction, leukocyte migration, chemotaxis. This process of inflammation initiates the repair and regeneration of the injured tissues. Though inflammation is a reparative process it causes significant distress due to pain and swelling. [2] Trismus, which is due to intramuscular inflammation, could be an associated distressing factor for the patient.

Hence, to minimize the unwanted effects of inflammation, it becomes essential to regulate the process of inflammation. [3]

**Aim and objective**

To compare the efficacy of trypsin-chymotrypsin and dexamethasone on post operative pain, swelling and trismus following impacted mandibular third molar removal

**MATERIAL AND METHOD**

Study was carried out on 50 patients who underwent surgical extraction of mandibular third molars. Out of the 50 patients selected, 25 patients were prescribed Tablet Dexamethasone 1mg for five days post operatively and remaining 25 were prescribed tablet Chymoral forte 1:1000000 armour units for 5 days post operatively. All patients in addition to this were prescribed antibiotics and analgesics.

**Inclusion criteria:** Patients with totally mesioangularly impacted teeth who were non-smoker and non-alcoholic and in

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the age group between 18 and 40 years with first and Second molar on the side of surgery.

**Exclusion criteria:** Patients with blood disorders, extra oral swelling with cellulitis in the area of surgery, systemic illness, pregnant women, acute Pericoronitis, patients already on steroid therapy.

All patients were explained about the study and effects of the drugs used. After obtaining consent for participation and completion of preoperative investigations, the patients were taken up for surgery under local anesthesia.

For the preoperative measurements seven points were first marked on the face with indelible ink: mandibular angle, tragus, lateral canthus of eye, alar base, lip commissure, pogonion, and midpoint of hyoid bone. With the mandibular angle as the base point, and using 3-0 silk suture to follow the contours of the face, the linear distances to the other landmarks were noted. The sum total of all measurements was taken as the facial size. And recorded for both groups separately, on first, third, fifth, and seventh post operative days.

Cheek girth was measured in closed mouth position using Vernier caliper by keeping one of the limbs of the calipers intraorally at a standardized point, i.e. the lingual embrasure between the first and second mandibular molars, and the other limb of the calipers extraorally so as to touch 1 cm above the antero-inferior border of masseter.

For recording the amount of mouth opening, the interincisal distance was measured using divider.

Pain score was recorded using visual analogue scale. Score was recorded after asking patient about their pain experience following post operative days.

Detailed case history was taken and recorded OPG were taken for all the patients. The face and intraoral operative site was prepared with povidone iodine solution, and standard draping was done. Anesthesia was secured with 2% lignocaine hydrochloride with 1:200000 Adrenaline through inferior alveolar block, lingual nerve block, and long buccal nerve block. Bone removal was carried out with a round bur, using the guttering technique on the buccal side and the distal aspect of the tooth, depending upon the type of impaction. Odontectomy was performed. The tooth was delivered from the socket by an elevator. The socket was irrigated with povidone iodine and saline after the sharp bony edges were smoothed. Complete hemostasis was achieved before wound closure with 3-0 silk suture.

The postoperative swelling, cheek girth, and the mouth opening and pain were measured in the same manner as was done preoperatively and was recorded. Pain assessment was made using a subjective visual analog scale. Mouth opening was measured between the incisal edges of the central incisors.

**RESULTS**

Statistical analysis was performed with the paired t-test and the independent t-test for comparison between the groups. Comparison of post-operative swelling between Dexamethasone and Chymotrypsin groups with pre operative facial measurement values showed statistically significant less swelling with Dexamethasone group on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> post operative days as compared to Chymotrypsin group. [Table 1]

Also, post operative cheek girth between Dexamethasone and Chymotrypsin groups with pre operative facial measurement values revealed that there was statistically significantly less swelling with Dexamethasone group on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup> post operative days as compared to Chymotrypsin group. [Table 1] Patients taking Dexamethasone showed better mouth opening ability as compared against Chymotrypsin group patients on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> post operative days. But none of the values compared, were statistically significant for mouth opening. [Table 1]

**Table 1** comparison of facial measurement (FMI), cheek girth (CG), mouth opening (MO) between dexamethasone and chymotrypsin

GROUP	N	Mean	Std. Deviation	T	DF	P Value
FM1-PRE Dexamethasone	25	3.6	0.5	-3.748	45.793	<0.001
Chymotrypsin	25	4.08	0.4			
FM 3-PRE Dexamethasone	25	5.48	0.51	-5.041	47.982	<0.001
Chymotrypsin	25	6.2	0.5			
FM5-PRE Dexamethasone	25	3.2	0.707	-9.798	48	<0.001
Chymotrypsin	25	4.8	0.408			
FM7-PRE Dexamethasone	25	1.4	0.645	-0.244	48	0.808
Chymotrypsin	25	1.44	0.507			
CG1-PRE Dexamethasone	25	3.48	0.714	-3.641	24	0.001
Chymotrypsin	25	4	0			
CG 3-PRE Dexamethasone	25	4.84	0.688	-7.791	38.562	<0.001
Chymotrypsin	25	6.08	0.4			
CG5-PRE Dexamethasone	25	2.96	0.539	-12.169	48	<0.001
Chymotrypsin	25	4.84	0.554			
CG7-PRE Dexamethasone	25	1.16	0.374	-3.523	44.463	0.001
Chymotrypsin	25	1.6	0.5			
MO1-PRE Dexamethasone	25	-9.96	2.685	1.68	48	0.099
Chymotrypsin	25	-11.04	1.767			
MO 3-PRE Dexamethasone	25	-7.6	2.141	2.385	48	0.021
Chymotrypsin	25	-8.92	1.754			
MO5-PRE Dexamethasone	25	-5.92	1.824	1.983	48	0.053
Chymotrypsin	25	-6.84	1.434			
MO7-PRE Dexamethasone	25	-3.04	1.207	2.213	48	0.032
Chymotrypsin	25	-3.76	1.091			

Comparison of post operative pain between Dexamethasone and Chymotrypsin groups revealed a statistically significantly less pain with Dexamethasone group on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, and 7<sup>th</sup> post operative days compared to Chymotrypsin group. [Table 2]

**Table 2** comparison of effect on pain between dexamethasone and chymotrypsin

PAIN1-PRE	Dexamethasone	25	5.12	0.666	17.492	48	<0.001
	Chymotrypsin	25	8.32	0.627			
PAIN 3-PRE	Dexamethasone	25	2.04	0.455	15.875	42.923	<0.001
	Chymotrypsin	25	4.56	0.651			
PAIN5-PRE	Dexamethasone	25	1	0	4	24	0.001
	Chymotrypsin	25	1.4	0.5			
PAIN7-PRE	Dexamethasone	25	0.6	0.5	4	24	0.001
	Chymotrypsin	25	1	0			

**DISCUSSION**

The surgical removal of an impacted third molar tooth can result in considerable pain, swelling, and dysfunction. It is said that the inflammatory process is necessary for healing to occur but inflammation also causes edema, pain, and trismus. [4] Swelling usually reaches its maximum within 48-72 hours of the surgical procedure. The vasoactive amines cause vasodilatation, thereby increasing blood flow to the inflamed area. Even meticulous surgical technique can minimize the sequelae of inflammation but will not prevent it completely. [5]

In our study we found that there was statistically significantly less swelling with dexamethasone group on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> post operative days as compared to Chymotrypsin group. Similar results were found showing Dexamethasone has better anti inflammatory effects in studies done by Weber and Griffin. [6] Statistically significant less cheek girth swelling was noted with Dexamethasone group on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup>, 7<sup>th</sup> post operative days as compared to Chymotrypsin group. Similar results were found in the studies done by Chopra *et al.* [7]

In our study patients taking Dexamethasone showed better mouth opening ability as compared against Chymotrypsin group patients on 1<sup>st</sup>, 3<sup>rd</sup>, 5<sup>th</sup> and 7<sup>th</sup> post operative days, but none of the values compared, were statistically significant for mouth opening which is similar to study conducted by Tahani Abdul *et al.* [8]

The possible reasoning for this could be that Dexamethasone acts by inhibiting the release of arachidonic acid from membrane lipids (by stimulating production of proteins called Annexins or Lipocortins which inhibit phospholipidase A<sub>2</sub>) indirectly reducing production of all eicosanoid PGs, TXs, and LTs. Moreover, they inhibit the induction of COX-2 by cytokines at the site of inflammation. Chymotrypsin acts by eicosanoid modulation, fibrinolytic activity, the activation of endogenous proteases and removal of necrotic tissue. [2,3,4]

## CONCLUSION

It seems reasonable to advocate the use of Dexamethasone after surgical removal of impacted mandibular third molar for management of post-operative edema, pain and trismus. Chymotrypsin can be used as an alternative drug to control inflammation in cases where corticosteroids are contraindicated and not feasible.

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