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Efficacy of medication on postoperative pain, swelling & Trismus after impaction of Mandibular third molar

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Abstract

Surgical removal of impacted third molars are associated with a range of postoperative complications. And to reduce the complications NSAIDS & Serratiopeptidase have individual benefits. Hence, the study was conducted to assess the efficacy of Diclofenac potassium & a combination of Diclofenac potassium + Serratiopeptidase on Pain, swelling & trismus.

Methodology: 30 patients were divided into two groups & tested for pain, swelling & trismus post operatively on 1,3 &5days.

Results: There was significant reduction in the size of swelling in group II compared to group I. But the difference was again nonsignificant 5 days after the surgery.

Conclusion: A synergistic combination of the two drugs have proven to be more effective than analgesic alone.

Keywords: Impacted third molar, Postoperative complications, Serratiopeptidase, Diclofenac Potassium.

1. Introduction

Surgical removal of tooth in Oral surgery inevitably requires bone removal, hence the most common postoperative complications of impacted lower third molar surgical removal are pain, trismus and facial swelling. Minimal trauma to adjacent soft tissues and proper wound closure minimizes pain, swelling and trismus. These can be controlled by proper and adequate administration of local anesthesia, mucoperiosteal flap reflection and its gentle handling, careful bone gutting and minimal trauma to adjacent soft tissues and appropriate wound closure techniques [1]. Many papers have suggested several measures to prevent and treat these complications [2]. Hence, assessment of postoperative sequelae following the removal of an impacted third molar is used in clinical pharmacology to evaluate the relative efficacy of various analgesic, anti-inflammatory drugs [3]. Among these, the administration of non-steroidal anti-inflammatory drugs (NSAID) is considered to be one of the most useful [2, 4, 5]

There are many studies which showed the effects of corticosteroids on postoperative wounds [6, 7, 8] Few studies on Serratiopeptidase has shown reduction of postoperative pain, swelling and trismus after mandibular third molar surgery [1, 6, 9].

Since very few researchers studied the efficacy of Diclofenac and Serratiopeptidase in postoperative management pain, swelling and trismus; very limited information is available in the literature regarding these drugs and so far, not many comparative studies are available on reduction of postoperative sequelae after mandibular third molar surgery. Hence an attempt has been made to study the efficacy of these drugs in patients undergoing surgical removal of mandibular third molars.

Aim

To assess the efficacy of Diclofenac Potassium & Diclofenac Potassium + Serratiopeptidase on Pain, swelling & Trismus.

Methodology

Present study was carried out on 30 patients on an out-patient basis in the department of Oral and Maxillofacial Surgery. Patients within the age group of 21 – 30 years were divided randomly into two groups. Irrespective of age and gender each group consisted of 15 patients.

Inclusion criteria;

Unilateral impacted mandibular 3rd molars.
Absence of pathologic changes in teeth and surrounding tissues.

Exclusion criteria

- Patients with bleeding disorders
- Extra oral or intra oral swelling with cellulitis around the area of surgery
- Presence of any systemic illness
- Patients on any other drugs including NSAIDS and Steroids

A written consent was obtained from all the patients after being explained about the study purpose and the nature of the surgical procedure performed and drugs prescribed after it. Ethical clearance was obtained from the institutional ethical committee. Pre-operative investigations which included a complete hemogram and serology in all the subjects. Patients who satisfied the inclusion and exclusion criteria were taken up for mandibular 3rd molar surgical removal under local anesthesia.

Diclofenac Potassium (50mg) for Group I, & a combination of Diclofenac Potassium & Serratiopeptidase (50mg+10mg) for Group II, 12th hourly for 5 days was post operatively prescribed to patients. The patients were recalled for a follow – up visit on 1st, 3rd and 5th day post-operatively.

Pre-operative facial measurements were obtained by marking 5 points on the face i.e. at the symphysis, mastoid, angle of mandible, lateral canthus of eye and the ala of nose. Measurements were taken from a point on the angle of mandible which served as a common point, to the tragus, lateral canthus of eye, ala of the nose, angle of the mouth and soft-tissue pogonion. Using a black silk suture measurements were recorded in millimeters.

Surgical procedure for removal of impacted mandibular third molar:

Under routine aseptic precautions, local anesthesia was achieved with 2% lignocaine hydrochloride with 1: 80,000 adrenaline, using the conventional inferior alveolar, lingual and long buccal nerve blocks. A standard Terrance-Ward incision was placed. A mucoperiosteal flap was raised exposing the underlying bone. Bone guttering was carried out on the buccal and distal aspects of the impacted tooth using a round bur HP 6 along with copious saline irrigation. The tooth was removed from the socket with the help of dental elevators. The socket was irrigated with povidone iodine and saline after the sharp bony edges were smoothed. Complete hemostasis was achieved and the wound closed using 3-0 silk suture. The follow up was carried out on the 1st, 3rd and 5th post-operative day.

All the patients were under standard antibiotic coverage with cap. amoxicillin 500 mg 8th hourly for 5 days postoperatively.

Criteria for post – operative pain assessment as follows,

- 1 No pain – the patient feels well
- 2 Slight pain- if the patient is distracted, he or she does not feel the pain
- 3 Mild pain- the patient feels the pain even if concentrating on some activity
- 4 Severe pain- the patient is very disturbed but nevertheless can continue with normal activities.
- 5 Very severe pain- the patient is forced to abandon normal activities.
- 6 Extremely severe pain – the patient must abandon every type of activity and feels the need to lie down.

The post-operative swelling and mouth opening were measured in the same manner as was done preoperatively. Pain assessment was made using subjective visual analog scale. Mouth opening was measured between the incisal edges of the maxillary and mandibular central incisors.

Data were analyzed using t test. A 95% confidence interval was set with a p value less than 0.05 considered as statistically significant. Data was analyzed using SPSS version 17.

Results

Table I shows the mean age & in group I it was 28.86±3.54 and in group II 29.33. There was no statistical difference in the mean age between the groups.

Table II shows comparison of pain experienced by study groups. Postoperative pain was more among group I during 1st and 3rd day which was statistically significant ($p<0.05$). During 5th day the pain intensity was similar in both the groups which was statistically nonsignificant. ($p>0.05$)

Table III shows facial measurements before and after surgery. There was significant increase in swelling experienced by both the groups after 1 day of surgery followed by a gradual decline after 3 and 5 days respectively. Swelling compared between two groups were statistically nonsignificant preoperatively. On 1st & on 3rd day there was significant difference in reduction in the swelling size in group II compared to Group I but the difference was again nonsignificant 5 days after the surgery. ($p>0.05$)

Mouth opening Pre – Operatively & after 1st day was nonsignificant among both the groups ($p>0.05$). After 3day the difference was significant ($p<0.05$) with better mouth opening observed in group II & after 5 days again the difference was nonsignificant. (Table IV)

Discussion

Surgical removal of impacted 3rd molar is a procedure which usually causes pain and swelling to the patient. But proper surgical technique and handling of tissues will minimize these symptoms. A defense mechanism to cell injury is inflammation & when tissue damage occurs, large quantities of histamine, bradykinin, serotonin and other substances are released into the surrounding area [1, 10] These substances, especially histamine causes local vasodilatation, thereby increasing blood flow to the damaged area. The permeability of venous capillaries and venules is also increased. This inflammatory process is necessary for healing to occur, but often excessive inflammation causes the patient unnecessary pain, swelling and trismus [1, 2]

Enzymes are considered as extremely potent substances and the possibility of their therapeutic application is attractive. Serratiopeptidase is a proteolytic enzyme produced by a microorganism *Serratia* species. This endopeptidase is prepared from the culture broth of genus *Serratia* SP E-15 (one of the enteric bacilli in silk worm). It has high enzyme activity, including a potent anti-inflammatory action, anti-swelling as well as bradykinin-decomposing activity and it also enhances the antibiotic action at the site of the lesion [1, 2]

When Serratiopeptidase was used for reduction of postoperative swelling in upper ankle joint surgery, significant reduction in swelling had been achieved post-operatively [11]. Al-Khateeb and Nusair investigated the ability of Serratiopeptidase to reduce post-operative pain, swelling and trismus after third molar surgery. There was a significant reduction in the pain intensity and extent of cheek swelling in the Serratiopeptidase group at the 2nd, 3rd and 7th post-operative days. However, this did not exert an appreciable

analgesic effect post-operatively [9]. This was in contrast to the present study as a combination of Serratiopeptidase along with Diclofenac potassium had the analgesic property as well along with the ability of Serratiopeptidase.

In a study by Aznar – Arasa [12], preoperative ibuprofen on pain and swelling after lower third molar removal was proved

to be effective & a study by Murugesan K [13], found that dexamethasone was more effective in reducing swelling and pain when compared with Serratiopeptidase, however both had same effect on trismus but in the present study a combination was more better than diclofenac alone.

Table I: Distribution of study subjects according to age

Groups	N	Mean	Std. Deviation	T value	P value and Significance
Group I	15	28.86	3.54	.91478	.91478
Group II	15	29.33	3.61	.93435	.93435

Table II: Comparison of pain score (VAS) experienced by study groups

	VAR00001	Mean	Std. Deviation	t value	P value and Significance
Pre - Operative	Group I	0.13	0.35	0.475	0.638 NS
	Group II	0.20	0.41		
1 Day	Group I	3.53	0.74	2.827	0.009 S
	Group II	2.80	0.67		
3 Days	Group I	2.66	0.72	2.814	0.009 S
	Group II	1.93	0.70		
5 Days	Group I	0.93	0.70	1.364	0.183 NS
	Group II	0.60	0.63		

Table III: Comparison of facial measurements experienced by study groups

	VAR00001	Mean	Std. Deviation	Std. Error Mean	Std. Error Mean
Pre - Operative	Group I	37.97	2.06	1.462	0.155 NS
	Group II	39.00	1.78		
1 Day	Group I	43.26	2.14	3.074	0.005 S
	Group II	40.99	1.88		
3 Days	Group I	41.20	1.72	3.019	0.005 S
	Group II	39.38	1.57		
5 Days	Group I	40.11	1.55	1.961	0.060 NS
	Group II	38.97	1.63		

Table IV: Comparison of Mouth opening experienced by study groups

	VAR00001	Mean	Std. Deviation	Std. Error Mean	Std. Error Mean
Pre - Operative	Group I	35.80	1.69	1.057	0.300 NS
	Group II	35.00	2.39		
1 Day	Group I	24.93	2.73	1.118	0.273 NS
	Group II	25.93	2.12		
3 Days	Group I	28.13	2.94	2.105	0.044 S
	Group II	26.00	2.59		
5 Days	Group I	33.80	1.65	2.007	1.055 NS
	Group II	32.73	1.22		

Conclusion

In the present study two different drugs diclofenac potassium and a combination of diclofenac potassium & Serratiopeptidase were compared for clinical efficacy on postoperative pain, swelling and trismus after surgical removal of mandibular third molars. Diclofenac Potassium affords better pain relief while Serratiopeptidase exerts better anti-inflammatory effects in the post-operative period. Hence synergistic combinations of these two drugs have proven more effective so is a better option when extensive post-operative sequelae are expected.

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