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Comparative Efficacy Of Ketorol Dt V/S Chymoral Forte Medications In Impacted Mandibular Third Molar Surgeries – A Prospective Study

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Abstract

Aims & Background: This study's objective was to assess the efficacy of of an enzyme preparation called Chymoral Forte and an NSAID called Ketorol-DT in treating trismus, oedema, and pain after surgery on impacted mandibular third molars.

Materials and Methods: 30 individuals undergoing impacted mandibular third molar extractions participated in this clinical trial that is randomised. Two groups of patients were formed: Group B (n=15) received Chymoral Forte (100,000 IU of trypsin and chymotrypsin) twice daily for seven days, while Group A (n=15) received Ketorol-DT (10 mg) every six hours for 24 hours following surgery. On Days 1, 3, and 7, the Visual Analogue Scale (VAS), measurements of the face, and measurements of the mouth opening were used to evaluate the patient's pain, oedema, and trismus.

Results: With a mean VAS score of 7.00 against 8.33 for Chymoral Forte, Ketorol-DT demonstrated superior pain reduction effectiveness. However, Chymoral Forte produced marginally better mouth opening (mean: 34.20 mm vs. 31.07 mm) and improved patient satisfaction (mean: 8.73 vs. 7.60). Postoperative oedema was considerably decreased by ketorol-DT (p=0.018).

Conclusion: While Chymoral Forte is less effective for pain but enhances patient satisfaction and recovery, Ketorol-DT is more effective for providing rapid pain relief and reducing oedema. A combination of the two could provide thorough postoperative care.

Clinical significance: For the management of pain and oedema, ketorol-DT is the better option, although chymoral forte improves patient satisfaction and healing in general.

Keywords: Ketorol-DT, Chymoral Forte, Third Molar Surgery, Postoperative Pain, Trismus

Introduction:

Dental retention is a major factor in third molar progression. These wisdom teeth are one of the most frequently extracted by dental professionals since they have a tendency to cause people's discomfort and health problems when they are impacted. This justifies the necessity for extraction. [1,2] This kind of operation is advised because the area where the removal is carried out alters and traumatises certain tissues, primarily the connective tissue that houses lymphatic and blood vessels. Many functional and anatomical changes could occur as a result of their treatment; they include the creation of oedema and the discharge of saliva, which may lead to the onset of trismus (Mouth Opening) and pain.[3-5] During the operation, tissue is affected, resulting in oedema that peaks 48 hours following the operation.[6] Following

third molar removal, trismus is directly correlated with the amount of swelling and inflammation caused by the procedure; that is, a higher degree of mouth opening constraint is anticipated the more swelling that results from an inflammatory response.[7,8] Surgical pain, which can be caused by both peripheral and central sensitisation, is one of the most frequent complications following third molar extraction and is a major source of concern for patients as it can negatively impact their quality of life.[9,10] In light of the aforementioned factors, it is recommended to utilise drugs with anti-inflammatory and analgesic effects. Nonsteroidal anti-inflammatory drug (NSAID) therapy is a well-suited postoperative treatment for dental procedures.[11] A recent systematic analysis found that, as compared to other medications, the prophylactic administration of ketorolac offers certain benefits for the treatment of discomfort following third molar surgery.[12] Ketorolac belongs to the NSAID class known as pyrrolo-pyrrole group and shares chemical similarities with indomethacin and tolmetin. This medication inhibits platelet aggregation in addition to its analgesic, anti-inflammatory, and antipyretic effects. The conventional mode of action of NSAIDs, which involves inhibiting the enzyme cyclooxygenase to prevent prostaglandin formation, is responsible for these effects. [13-15] A sequence of alternating occurrences is involved in the development and remodelling of the outermost layer of cells during wound healing.[16] Fibrin and fibronectin make up the majority of the clot that forms throughout the healing process. Plasmin then dissolves the protein called fibrin block to restore blood flow. The liver produces acute phase proteins in reaction to injury, such as alpha 1 antitrypsin and alpha 2 macroglobulin, which attach to plasmin and cause fibrinolysis to be blocked.[17] Trypsin:chymotrypsin is an orally proteolytic enzyme medication that has been used in medicine since the 1960s. It promotes a speedier recovery from acute tissue damage and enhances the reduction of inflammatory symptoms as compared to several other enzyme formulations now available on the market.[18]

Methods:

Study Design: This research was planned as a controlled, randomised clinical trial to assess the effectiveness of two pharmacological interventions, Ketorol-DT and Chymoral Forte, in the treatment of trismus, oedema, irritation, and pain after surgery on the mandibular third molar. The trial was conducted over a period of three months, with patient recruitment and follow-up conducted at a tertiary care hospital's dental surgery department.

Sample Size: The study comprised thirty individuals in total who had their impacted mandibular third molars extracted. Two groups of patients were randomly assigned:

Group A (n = 15): Ketorol-DT was given out.

Group B (n=15): Chymoral Forte was given to them.

Inclusion Criteria: The study comprised individuals ranging in age from 18 to 40 years old who were having their impacted mandibular third teeth extracted. All patients had no known allergies to NSAIDs or enzyme preparations and had no history of systemic inflammatory diseases or conditions that could influence pain perception or healing, such as diabetes or immunocompromised states. Furthermore, the study only included patients who gave their informed consent.

Exclusion Criteria

Study exclusion standards included pregnant or lactating women, patients with a history of gastrointestinal ulcers or bleeding disorders, and those who had used other NSAIDs, corticosteroids, or enzyme preparations within two weeks prior to surgery. Additionally, patients with active infections or systemic conditions that might affect wound healing were also excluded.

Intervention: Group A: Patients were administered Ketorol-DT tablets (10 mg) every 6 hours for the first 24 hours post-surgery and then as needed based on pain severity for up to 7 days.

Group B: Patients were administered Chymoral Forte tablets (containing 100,000 IU of trypsin and chymotrypsin) twice daily for 7 days.

Assessment and Follow-up Patients were assessed postoperatively on Day 1, Day 3, and Day 7 for the following outcomes:

Pain Measurement: A recognised instrument for assessing pain, the Visual Analogue Scale (VAS), was used to

determine the intensity of the pain. On a scale of 0 to 10, with 10 denoting the greatest amount of pain, patients were asked to rate their level of pain. To maintain consistency, pain evaluations were performed at the same time every day. (Figure 1)

Trismus Measurement: Trismus, or restricted mouth opening, was measured using a millimeter ruler. A measurement was taken of the gap between the upper and lower middle incisors, and patients were asked to expand their jaws as widely they could without causing severe pain. Baseline preoperative measurements were taken, and changes were monitored postoperatively. (Figure 2)

Swelling Measurement: A flexible tape was used to measure the dimensions of the face in order to evaluate postoperative swelling. The following measurements were obtained: Anteroposterior distance: The distance between the tragus of the ear and the ala of the nose. Inter-pupillary distance: Measured from the lower lip's vermillion border. These measurements were taken in a seated position, and the difference in measurements from preoperative baseline values was used to quantify swelling. (Figure 3)

Inflammation Assessment: Inflammation was evaluated by measuring the change in facial dimensions as described above. Additional clinical signs of inflammation, such as erythema and warmth, were also recorded by the clinician.

Data Analysis: The statistical program SPSS was used to analyse the collected data. Descriptive statistics, including mean and standard deviation, were calculated for pain, swelling, inflammation, and trismus at each time point. The efficacy of the two interventions was compared using appropriate statistical tests to assess the importance of variations amongst groups. Statistical significance was attained when the p-value was less than 0.05.

Ethical Considerations: The institutional ethics committee authorised the study protocol, and prior to recruitment, each subject gave written informed consent.

Results:

The results of the study showed that the patients' Visual Analogue Scale (VAS) scores, which ranged from 5 to 9, on average, 7.67, indicated that they were experiencing moderate to severe postoperative pain. This shows that even though patients' pain thresholds varied, the majority of them had severe suffering. The measurements for trismus, or restricted mouth opening, varied from 30 to 35 mm, with a mean of 32.63 mm. This suggests that individuals had mild to moderate restrictions on their ability to open their mouths after surgery. Notwithstanding these difficulties, patient satisfaction ratings, which ranged from 7 to 10, with an average of 8.17, were generally high. This indicates that although the patients suffered moderate pain and trismus, they were generally satisfied with their postoperative care. (Table 1) (Figure 4)

The group statistics show that there are variations in the management of postoperative pain, mouth opening, and patient satisfaction between Ibuprofen with Chymoral Forte and Ketorolac DT. The group using Ibuprofen plus Chymoral Forte had a mean score of 8.33 on the Visual Analogue Scale (VAS), which indicates higher pain levels than the group taking ketorolac DT, which had a mean score of 7.00. having a p-value of 0.354 and an F-value of 0.887, the pain scores of the two groups differed statistically significantly, indicating that ketorolac DT may be more useful in the treatment of pain. The group using Ibuprofen with Chymoral Forte had a mean mouth opening of 34.20 mm, but the group taking Ketorolac DT had a mean of 31.07 mm, which is a measure of trismus. It appears that both treatments produced results that were comparable in terms of mouth opening because mouth opening did not differ statistically significantly between the groups, as evidenced by the high p-value of 0.962 and the moderate F-value of 0.002. With a mean score of 8.73 against 7.60 in the Ketorolac DT group, the patient satisfaction levels were higher in the Ibuprofen with Chymoral Forte group. The F-value of 0.011 and the p-value of 0.917 indicate an increase towards greater satisfaction with Ibuprofen with Chymoral Forte, even if the distinction was not statistically significant. There were variations in postoperative oedema, which is quantified by the extent of swelling, among the two groups. individuals in the Ibuprofen with Chymoral Forte group had greater oedema diameters (31–37 cm), whereas more individuals in the Ketorolac DT group had smaller sizes (41–45 cm). These variations in oedema size were statistically significant, as seen by the 0.018 p-value and chi-square value of 8.077. This suggests that Ketorolac DT may be more helpful in lowering postoperative swelling than Ibuprofen

with Chymoral Forte. (Table 2)

Discussion:

The present research offers a comparative assessment of Ketorol-DT and Chymoral Forte in the management of postoperative outcomes subsequent to mandibular third molar procedures. The results show that each medicine has unique benefits when it comes to managing particular postoperative issues. This study found that Ketorol-DT, a nonsteroidal anti-inflammatory medicine (NSAID), was superior to Chymoral Forte in terms of delivering rapid pain relief. This was demonstrated by the lower mean Visual Analogue Scale (VAS) scores in the Ketorol-DT group. This aligns with the study by et al.,[19] discovered that administering intravenous ketorolac prior to surgery prolonged the time before severe postoperative pain—that is, pain that necessitates the use of analgesic medication—began nearly two hours later. The analgesic efficacy of ketorolac has been mentioned by multiple writers. It has been shown that intramuscular ketorolac doses of 10 mg and 30 mg had comparable analgesic efficacy for postoperative pain control. [20,21]

However, a distinct set of advantages was shown by Chymoral Forte, an enzyme preparation that contains both chymotrypsin and trypsin. The higher mean VAS scores indicate that it was less successful in controlling pain immediately after surgery, but it did greatly increase patient satisfaction and enable better mouth opening. Al-Sandook TA et al.,[22] found that the orthal forte(Trypsin-Chymotrypsin), comparing the group to the control group, the amount of cheek oedema decreased on the second, third, and seventh postoperative days in a way that is statistically significant. Additionally, comparing the orthal forte group to the control group, there was a statistically significant drop in the mean pain intensity scores on the first, second, third, and seventh postoperative days.

The value of NSAIDs in reducing postoperative inflammation and swelling is highlighted by the statistically significant decrease in postoperative oedema observed with Ketorol-DT in comparison to Chymoral Forte ($p=0.018$). This is consistent with other studies showing NSAIDs decrease postoperative pain in third molar extraction surgery.[23-25] In light of the aforementioned data, it is possible to draw the following conclusions: while Chymoral Forte provides significant advantages in terms of trismus reduction and improved patient satisfaction during the recovery phase, Ketorol-DT should be the first choice for managing severe pain and inflammation immediately following third molar surgery. Additional research with larger sample sizes and combination therapy regimens is advised in order to validate these data and improve postoperative care protocols.

Conclusion: The outcomes of this prospective investigation that compared Ketorol-DT with Chymoral Forte's effectiveness in treating postoperative pain after surgeries on impacted mandibular third molars show unique benefits for each drug. With noticeably lower VAS values, ketorol-DT showed better efficacy in providing instant pain relief, demonstrating its strong analgesic qualities. Additionally, smaller patient oedema sizes showed that Ketorol-DT was more successful in lowering postoperative swelling. This implies that Ketorol-DT might be the better option when it comes to controlling acute pain and inflammation following surgery. However, the combination of Chymoral Forte and Ibuprofen improved patient satisfaction scores, which could be explained by Chymoral Forte's ability to reduce postoperative swelling and speed up recovery. Additionally, patients treated with Chymoral Forte showed increased mouth opening, which suggests that Chymoral Forte may help minimise trismus, though this difference was not statistically significant.

Figures and figure legends

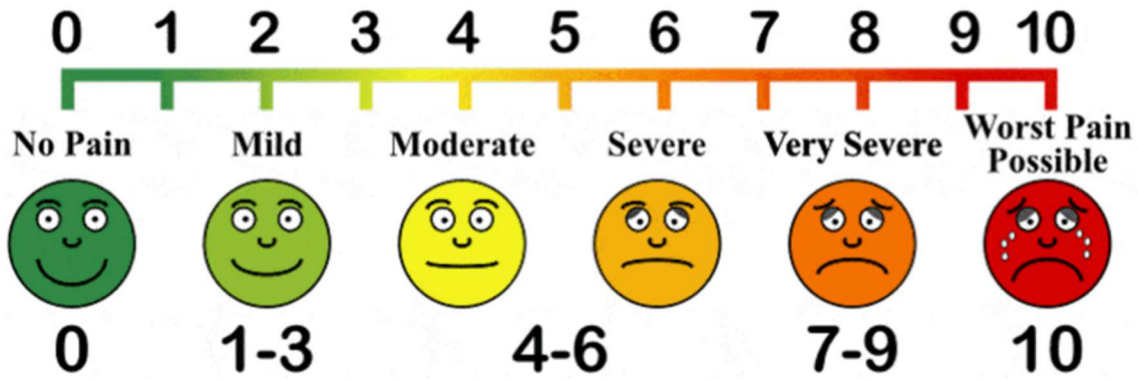

Figure 1 Visual Analog Scale with Wong-Baker facial ideographic scale

Figure 2 Measurement of Trismus using normal scale

Figure 3 Swelling after Third Molar Surgery

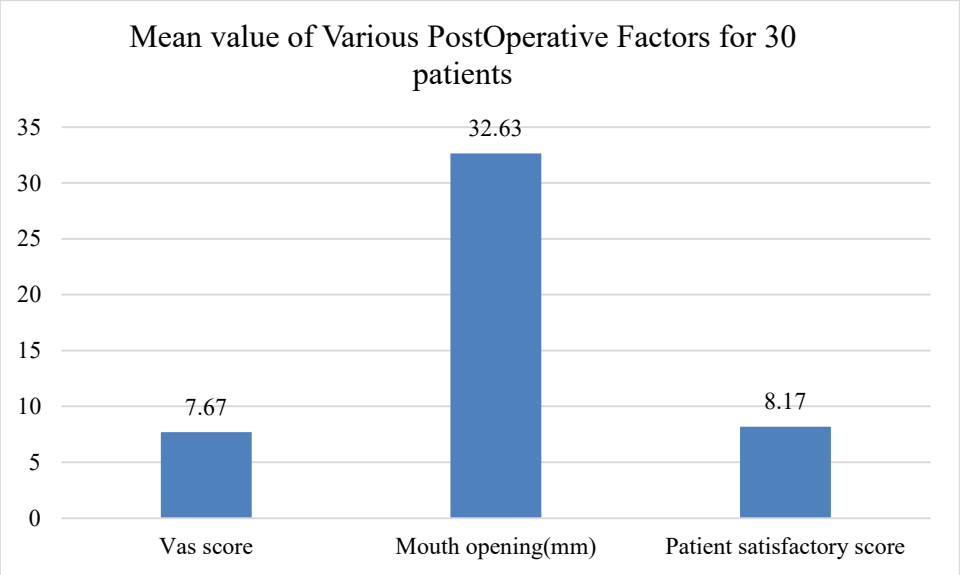

Figure 4 Postoperative Outcomes: Pain Intensity, Mouth Opening, and Patient Satisfaction

Tables and table legends

Table 1 Postoperative Outcomes: Pain Intensity, Mouth Opening, and Patient Satisfaction

	N	Minimum	Maximum	Mean	Std. Deviation
Vas score	30	5	9	7.67	1.061
Mouth opening(mm)	30	30	35	32.63	1.790
Patient satisfactory score	30	7	10	8.17	0.791

Table 2 COMPARISION OF KETOROL DT vs CHYMORAL FORTE MEDICATIONS

Group Statistics						
	Group	N	Mean	Std. Deviation	F	Sig.
Vas score	IBOPROFEN with chymoral forte	15	8.33	0.816		
	Ketorolac DT	15	7.00	0.845	0.887	0.354
Mouth opening(mm)	IBOPROFEN with chymoral forte	15	34.20	0.775	0.002	0.962
	Ketorolac DT	15	31.07	0.884		
Patient satisfactory score	IBOPROFEN with chymoral forte	15	8.73	0.594	0.011	0.917
	Ketorolac DT	15	7.60	0.507		

			IBOPROFEN with chymoral forte	Ketorolac DT	Chi Square	p-value	
	Oedema	3*1 - 3*7 cm	7	6	8.077	0.018	
		4*1 - 4*5 cm	3	9			
		5*1 - 5*5 cm	5	0			
		Total	15	15			

In conclusion, Chymoral Forte provides a valuable alternative with improved patient satisfaction and possible benefits in the therapy of trismus, even though Ketorol-DT is highly successful in controlling acute postoperative pain and lowering swelling. This is especially true when paired with Ibuprofen. When these drugs are used together, it may be possible to optimise postoperative treatment for third molar procedures in a way that balances pain management, swollen reduction, and patient satisfaction. The synergistic effects of these drugs could be investigated in bigger sample size studies to determine the best postoperative treatment regimen.

Clinical significance: This study is clinically significant because it demonstrates how Ketorol-DT and Chymoral Forte can be used in combination to manage postoperative pain after procedures on the mandibular third molar. Ketorol-DT is the recommended option during the acute postoperative phase due to its superior efficacy in lowering postoperative oedema and delivering fast pain relief. Conversely, Chymoral Forte was discovered to improve patient satisfaction and enable more effective mouth opening through the reduction of trismus, thereby facilitating a more seamless recuperation process. According to these results, a combination of Chymoral Forte and Ketorol-DT may provide thorough postoperative care that successfully manages patient comfort, pain, and swelling.

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