

Tramadol Versus Ketorolac for Pain Management after Third Molar Surgery

Saloni Bharti¹ Harsha Vardhan Choudhary^{2*} Anupama Singh³ Karn Singh⁴ Ritesh Vatsa⁵

¹Consultant Oral and maxillofacial surgeon, Patna Medicity, Hospital Patna, India.

²Dental Surgeon, PHC Parwalpur, Nalanda, Bihar, India.

³Senior Resident, Department of Dentistry, Darbhanga Medical College and Hospital, Laheriasarie, Darbhanga, Bihar, India.

⁴Senior Resident, Department of Dentistry, Darbhanga Medical College and Hospital, Laheriasarie, Darbhanga, Bihar, India.

⁵Assistant Professor, Department of Dentistry, Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar, India.

ABSTRACT

Background: Third molar surgery is the most common procedure carried out by oral and maxillofacial surgeons. Pain associated with surgical removal of mandibular third molars ranges between moderate and severe after surgery. The present study was carried out to assess the analgesic efficacy of Tramadol and ketorolac after third molar surgery.

Material and methods: The present study was carried out with a sample size of 120 patients of both genders of age from 20 to 50 years. Patients were subjected to clinical examination, intraoral periapical radiographs, and orthopantomograms. The patients were randomly divided into two groups (Group A & Group B) of 60 each. Group A patients were given ketorolac 10 mg thrice and Group B patients were given Tramadol 50 mg twice postoperatively. Pain intensity was recorded after 30 minutes, 1st hr., 6th hrs, 12th hrs and 24 hrs and 3rd postoperative days. Pain was recorded on VAS (visual analogue scale). Statistical analysis was done using SPSS software version 20.0 (IBM Corp. Armonk, NY. USA). A P < 0.05 was considered statistically significant.

Results: In the present study a sample size of 120 patients of both genders of age from 20 to 50 years were selected. The comparison of pain intensity score between ketorolac and Tramadol was calculated at different time intervals. The VAS score at 30 mins in group A was 4.26, at 1st hr it was 2.56, at 6th hr it was 5.40, at 12th hr it was 4.78, at 24 hrs it was 2.29 and at 3rd day it was 1.12. Whereas in group B the VAS score at 30 mins in group A was 7.95, at 1st hr it was 3.23, at 6th hr it was 2.01, at 12th hr it was 3.08, at 24 hrs it was 2.14 and at 3rd day it was 2.01.

Conclusion: This study concluded that ketorolac induces early analgesic effect with half hour and Tramadol induce delayed analgesic effect. Therefore, for post-operative acute pain, ketorolac DT is a good analgesic drug given for shorter duration to provide relief.

Keywords: Orthopantomograms, ketorolac, Tramadol, Pain intensity, visual analogue scale.

INTRODUCTION

Third molar surgery is the most common procedure carried out by oral and maxillofacial surgeons, and it is a common model for evaluating the efficacy of analgesics for acute dental pain relief.¹ Pain following third molar surgery reaches to severe intensity or peak with in first 5-8 hrs after the

surgery.² Impacted third molar extraction involves both soft and bone tissue trauma and may result in an acute inflammation with intense discomfort as well as pain. Pain is a subjective symptom and can be influenced by various factors like age, sex, anxiety, pain threshold and surgical difficulty etc.

Received: Nov. 16, 2020; Accepted: Jan. 3, 2020

*Correspondence Dr. Harsha Vardhan Choudhary.

PHC Parwalpur, Nalanda, Bihar, India.

Email: dr.harsha.hvc@gmail.com

pain experienced after impacted third molar surgery under local anesthesia has been shown to be of short duration and reaches its maximum intensity in early post-operative period which requires analgesics for relief. Post-operative pain can cause distress to the patient and affect the patient's quality of life after surgery.³ Various analgesics have been used for this purpose, including nonsteroidal anti-inflammatory drugs (NSAIDs) and some opioids.^{4,5} Ketorolac tromethamine, a member of pyrrolo-pyrrole group, has an analgesic, anti-inflammatory, and antipyretic activity and has been significantly effective for postoperative dental pain, is available for IV, intramuscular, and oral administration.^{6,7} Tramadol hydrochloride, which is a synthetic analog of codeine, has been proved clinically effective in treating moderate to moderately severe pain while having a low addiction potential and causing minimal respiratory depression.^{6,8,9} The present study was carried out to assess the analgesic efficacy of Tramadol and ketorolac after third molar surgery.

MATERIAL AND METHODS

The present study was carried out with a sample size of 120 patients of both genders of age from 20 to 50 years. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and all the patients were informed about the treatment procedure and possible complications were also explained to them. Informed consent was taken from them. Patients with the physical status ASA I were included in the study, patient having mandibular impacted teeth indicated for surgical extraction that were willing to participate in the study. Medically compromised patients, pregnancy, patient on steroid therapy, metabolic disorder patients, those who had taken any type of analgesic in the past 48 hrs, patients allergic to the drugs and patients who are not willing to participate in the study were excluded from the study. Patients were subjected to clinical examination, intraoral periapical radiographs, and orthopantomograms. Preoperative OPG radiograph was recorded to assess the type of impaction (mesioangular, distoangular, horizontal and vertical). The patients were randomly divided into two groups (Group A & Group B) of 60 each. Group A patients were given ketorolac 10 mg thrice and Group B patients were given Tramadol 50 mg twice

postoperatively. Pain intensity was recorded after 30 minutes, 1st hr., 6th hrs, 12th hrs and 24 hrs and 3rd postoperative days. Pain was recorded on VAS (visual analogue scale) [0-no pain, 2-mild pain, 4-tolerable, 6-distressful pain, 8-severe pain and 10-totally disabling pain]. Statistical analysis was done using SPSS software version 20.0 (IBM Corp. Armonk, NY. USA). A $P < 0.05$ was considered statistically significant.

RESULTS

In the present study a sample size of 120 patients of both genders of age from 20 to 50 years were selected. The comparison of pain intensity score between ketorolac and Tramadol was calculated at different time intervals. The VAS score at 30 mins in group A was 4.26, at 1st hr it was 2.56, at 6th hr it was 5.40, at 12th hr it was 4.78, at 24 hrs it was 2.29 and at 3rd day it was 1.12. Whereas in group B the VAS score at 30 mins in group A was 7.95, at 1st hr it was 3.23, at 6th hr it was 2.01, at 12th hr it was 3.08, at 24 hrs it was 2.14 and at 3rd day it was 2.01.

Table 1: Distribution of pain intensity score (VAS) between two groups at different time intervals post-operatively.

Groups	30 mins	1st hr	6 th Hr	12 th hr	24 hrs	3 rd day
Group A	4.26	2.56	5.40	4.78	2.29	1.12
Group B	7.95	3.23	2.01	3.08	2.14	2.01

Ketorolac has been introduced as a parenteral NSAID for the control of postoperative pain and its analgesic potency has been shown to be comparable with morphine.^{10,11} In spite of being an opioid, tramadol can routinely be used because of lack of drug tolerance and respiratory depression. With an analgesic efficacy equivalent to ketorolac, tramadol is believed to have a multimodal action.¹¹

In the present study a sample size of 120 patients of both genders of age from 20 to 50 years were selected. The comparison of pain intensity score between ketorolac and Tramadol was calculated at different time intervals. The VAS score at 30 mins in group A was 4.26, at 1st hr it was 2.56, at 6th hr it was 5.40, at 12th hr it was 4.78, at 24 hrs it was 2.29 and at 3rd day it was 1.12. Whereas in group B the VAS score at 30 mins in group A was 7.95, at 1st hr it

was 3.23, at 6th hr it was 2.01, at 12th hr it was 3.08, at 24 hrs it was 2.14 and at 3rd day it was 2.01.

Gopalraju et al. observed intravenous ketorolac 30 mg provides better pain control postoperatively as compared to 50 mg of tramadol after third molar surgery.¹² Shah et al. 2013 in their study concluded that intramuscular 30 mg ketorolac gives better pain management, if given prior to oral surgical procedure than intravenous 50 mg tramadol.¹³ A study using preemptive analgesia showed that tramadol 50 mg intravenous (i.v.) is more effective than oral tramadol 50 mg in relieving pain after third molar surgery.¹⁴

Another study demonstrated that ketorolac 30 mg i.v. produces better preventive analgesic efficacy than tramadol 50 mg i.v. when administered preoperatively in third molar surgery.⁶ However, Bouloux GF et al. in their study rated tramadol as a better drug when compared to ketorolac when used for postoperative pain management following nasal surgeries.¹⁵ In the double-blind, randomized, clinical trial Mishra et al. 2012 proved that 100 mg of tramadol is equally effective as 20 mg of ketorolac in the relief of postoperative pain.¹⁶

CONCLUSION

This study concluded that ketorolac induces early analgesic effect with half hour and Tramadol induce delayed analgesic effect. Therefore, for post-operative acute pain, ketorolac DT is a good analgesic drug given for shorter duration to provide relief.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

REFERENCES

- Cooper SA, Beaver WT. A model to evaluate mild analgesics in oral surgery outpatients. Clin Pharmacol Ther. 1976;20:241-50.
- Seymour RA, Meechan JG, Blair GS. An investigation into postoperative pain after third molar surgery under local analgesia. Br J Oral Maxillofac Surg. 1985;23:410-8.
- KhorshidiKhiavi R, Pourallahverdi M, Pourallahverdi A, GhoraniKhiavi S, Ghertasi Oskouei S, Mokhtari H. Pain control following impacted third molar surgery with bupivacaine irrigation of tooth socket: A prospective study. J Dent Res Dent Clin Dent Prospects 2010;4:105-109.
- Hyrkas T, Ylipaavalniemi P, Oikarinen VJ, Paakkari I. A comparison of diclofenac with and without single-dose intravenous steroid to prevent postoperative pain after third molar removal. J Oral Maxillofac Surg 1993;51:634-636.
- López Carriches C, Martínez González JM, Donado Rodríguez M. The use of methylprednisolone versus diclofenac in the treatment of inflammation and trismus after surgical removal of lower third molars. Med Oral Patol Oral Cir Bucal. 2006;11:E440-5.
- Esteller-Martínez V, Paredes-García J, Valmaseda-Castellón E, Berini-Aytés L, Gay-Escoda C. Analgesic efficacy of diclofenac sodium versus ibuprofen following surgical extraction of impacted lower third molars. Med Oral Patol Oral Cir Bucal. 2004;9:448-53; 444-8.
- Ong KS, Tan JM. Preoperative intravenous Tramadol versus oral Tramadol for preventing post operative pain after third molar surgery. Int J Oral Maxillofac Surg 2004;33:274-278.
- GaribaldijA, Elder MF. Evaluation of ketorolac (Toradol) with varying amounts of codeine for postoperative extraction pain control. Int J Oral Maxillofac Surg 2002;31:276-80.
- Pozos-Guillen A, Martinez-Rider R, Aguirre-Banuelos P, Perez-Urizar J. Pre-emptive analgesic effect of tramadol after mandibular third molar extraction: A pilot study. J Oral Maxillofac Surg 2007;65:1315-20.
- Pozos AJ, Martínez R, Aguirre P, Pérez J. Tramadol administered in a combination of routes for reducing pain after removal of an impacted mandibular third molar. J Oral Maxillofac Surg 2007;65:1633-9.
- Tarkkila P, Tuominen M, Rosenberg PH. Intravenous ketorolac vs diclofenac for analgesia after maxillofacial surgery. Can J Anaesth 1996;43:216-20.

11. Isiordia-Espinoza MA, Sánchez-Prieto M, Tobías-Azúa F, Reyes-García JG, Granados-Soto V. Pre-emptive analgesia with the combination of tramadol plus meloxicam for third molar surgery: A pilot study. *Br J Oral Maxillofac Surg* 2012;50:673-7.
12. Gopalraju P, Lalitha RM, Prasad K, Ranganath K. Comparative study of intravenous tramadol versus ketorolac for preventing post-operative pain after third molar surgery-A prospective randomized study. *J Craniomaxillofac Surg*. 2014;42:629-633.
13. Shah AV, Arun Kumar KV, Rai KK, Rajesh Kumar BP. Comparative evaluation of pre-emptive analgesic efficacy of intramuscular ketorolac versus tramadol following third molar surgery. *J Maxillofac Oral Surg*. 2013;12:197-202.
14. Ong CK, Lirk P, Tan JM, Sow BW. The analgesic efficacy of intravenous versus oral tramadol for preventing postoperative pain after third molar surgery. *J Oral Maxillofac Surg*. 2005;63:1162-8.
15. Bouloux GF, Punnia-Moorthy A. Bupivacaine versus lidocaine for third molar surgery: A double-blind, randomized, crossover study. *J Oral Maxillofac Surg* 1999;57:510-4.
16. Mishra H, Khan FA. A double-blind, placebo-controlled randomized comparison of pre and postoperative administration of ketorolac and tramadol for dental extraction pain. *J Anaesthesiol Clin Pharmacol*. 2012;28:221-225.