

## Original Research

### Tramadol versus ketorolac for pain management after third molar surgery

<sup>1</sup>Anshu Gupta, <sup>2</sup>P.Subramanian, <sup>3</sup>Ketaki Rajguru, <sup>4</sup>Krishan Yadav, <sup>5</sup>Mahendra Kumar Kumawat, <sup>6</sup>Sadaf Rahman

<sup>1</sup>Consultant, Department of Conservative Dentist and Endodontist, Jammu, Jammu and Kashmir, India;

<sup>2</sup>Chief Oral & Maxillofacial Surgeon, Tarun Dental Centre, Trichy, Tamil Nadu, India;

<sup>3</sup>Senior Lecturer, Department of Conservative Dentistry and Endodontics, Tatyasaheb Kore Dental College and Research Centre, Kolhapur, Maharashtra, India;

<sup>4</sup>Senior Lecturer, Department of Oral and Maxillofacial Surgery, Rajasthan Dental College & Hospital, Jaipur, Rajasthan, India;

<sup>5</sup>Senior Lecturer, Department of Oral and Maxillofacial Surgery, Daswani Dental College & Research Center, Kota, Rajasthan, India;

<sup>6</sup>Consultant Oral and Maxillofacial Surgeon, Vedant Multispeciality Hospital, Delhi, India

#### ABSTRACT:

**Background:** Pain is a major symptom after many dental procedures, especially tooth extractions, and its management is a challenging part of dentistry. The present study was conducted to compare tramadol versus ketorolac for pain management after third molar surgery. **Materials & Methods:** 90 patients undergoing unilateral mandibular third molar surgery of both genders were divided into 3 groups of 30 each. Group I received Tramadol 1 mg/kg diluted with saline to 2 ml, group II received Ketorolac 0.5 mg/kg diluted with saline to 2 ml and group III received saline 2 ml. Pain after the surgical procedure was assessed using a visual analog scale (VAS) on 1<sup>st</sup> hour, 6<sup>th</sup> hour and 24<sup>th</sup> hour. **Results:** Out of 45 patients, males were 25 and females were 20. The mean age in group I was 21.3 years, in group II was 22.5 years and in group III was 20.6 years. Time taken for surgery was 28.1 minutes in group I, 27.5 minutes in group II and 21.3 minutes in group III. The difference was significant ( $P < 0.05$ ). The mean VAS at 1<sup>st</sup> hour was 5.4, 5.7 and 5.5, at 6<sup>th</sup> hour was 2.3, 2.8 and 3.7 and at 24<sup>th</sup> hour was 1.0, 1.4 and 3.5 in group I, II and III respectively. The difference was significant ( $P < 0.05$ ). **Conclusion:** Tramadol is superior than Ketorolac and saline in reducing pain after mandibular third molar surgery.

**Key words:** Pain, Tramadol, Ketorolac

Received: 19 February, 2023

Accepted: 24 March, 2023

**Corresponding author:** Anshu Gupta, Consultant, Department of Conservative Dentist and Endodontist, Jammu, Jammu and Kashmir, India

**This article may be cited as:** Gupta A, Subramanian P, Rajguru K, Yadav K, Kumawat MK, Rahman S. Tramadol versus ketorolac for pain management after third molar surgery. J Adv Med Dent Scie Res 2023;11(4):108-110.

#### INTRODUCTION

Pain is a major symptom after many dental procedures, especially tooth extractions, and its management is a challenging part of dentistry. For years researchers have sought the best analgesia after tooth extractions.<sup>1</sup> Several biochemical mediators are involved in the pain process, particularly histamine, bradykinin and prostaglandins. The intensity of postoperative pain ranges from moderate to severe during the first 24 hours after surgery, with the pain peak being within the first 12 hours when a medium-acting local anesthetic is used.<sup>2</sup> Numerous studies have investigated alternatives for the management of pain and discomfort generated by third molar surgery. Several analgesics have been used for this purpose,

including nonsteroidal anti-inflammatory drugs and some opioids.<sup>3</sup>

Tramadol hydrochloride is a synthetic, centrally acting analgesic with a low affinity for opioid receptors. Structurally, it is related to codeine and morphine.<sup>4</sup> Tramadol is effective for treating moderate to severe pain, including postsurgical, obstetric, and terminal cancer pain and pain of coronary origin.<sup>5</sup> Ketamine is a phencyclidine derivative that provides Q2 analgesia at sub-anesthetic doses. It can be administered intravenously, intramuscularly, orally, or rectally. It is an N-methyl-D-aspartate receptor antagonist with opioid receptor activity and is an effective agent for neuropathic and nociceptive pain.<sup>6</sup> The present study

was conducted to compare tramadol versus ketorolac for pain management after third molar surgery.

## MATERIALS & METHODS

The present study comprised of 90 patients undergoing unilateral mandibular third molar surgery of both genders. All enrolled patients gave their written consent.

Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups of 30 each. Group

I received tramadol 1 mg/kg diluted with saline to 2 ml, group II received Ketorolac 0.5 mg/kg diluted with saline to 2 ml and group III received 2 ml saline. Ward's incision was used for flap reflection. The average time taken to perform the surgery was recorded. Pain after the surgical procedure was assessed using a visual analog scale (VAS) on 1<sup>st</sup> hour, 6<sup>th</sup> hour and 24<sup>th</sup> hours. Data thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

**Table I Assessment of parameters**

Parameters	Group I	Group II	Group III	P value
Mean age (years)	21.3	21.5	20.4	0.82
Time taken for surgery (mins)	29.1	28.5	22.3	0.05

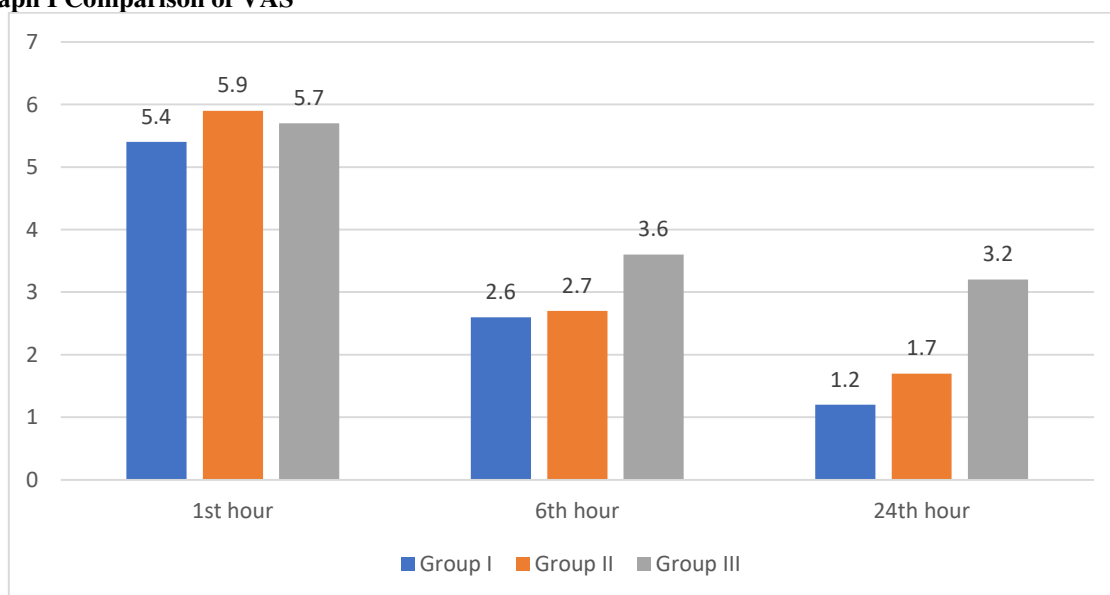
Table I shows that mean age in group I was 21.3 years, in group II was 21.5 years and in group III was 20.4 years. Time taken for surgery was 29.1 minutes in group I, 28.5 minutes in group II and 22.3 minutes in group III. The difference was significant ( $P < 0.05$ ).

**Table II Comparison of VAS**

VAS	Group I	Group II	Group III	P value
1 <sup>st</sup> hour	5.4	5.9	5.7	0.95
6 <sup>th</sup> hour	2.6	2.7	3.6	0.04
24 <sup>th</sup> hour	1.2	1.7	3.2	0.02

Table II, graph I shows that mean VAS at 1<sup>st</sup> hour was 5.4, 5.9 and 5.7, at 6<sup>th</sup> hour was 2.6, 2.7 and 3.6 and at 24<sup>th</sup> hour was 1.2, 1.7 and 3.2 in group I, II and III respectively. The difference was significant ( $P < 0.05$ ).

**Graph I Comparison of VAS**



## DISCUSSION

Surgical removal of an impacted mandibular third molar causes swelling, trismus, and moderate to severe pain. Post-surgery pain control after third molar surgery may lead to improved recovery in terms of lifestyle and oral function.<sup>7</sup> The various analgesics used intravenous (IV) techniques are ketorolac, tramadol, paracetamol, nalbuphine, and buprenorphine.<sup>8</sup> Tramadol is a centrally acting, synthetic opioid analgesic with low affinity for opioid

receptors. It is structurally identical to the morphine and codeine.<sup>9</sup> Tramadol is been used effectively to treat moderate-to-severe pain including terminal cancer pain, obstetrics, perioperative, and pain of coronary origin. It is also used in combination with acetaminophen to treat severe pain of dental origin where nonsteroidal anti-inflammatory drugs (NSAIDs) are contraindicated. Ketorolac is an anesthetic agent with analgesic efficacy at subanesthetic dosage. It is an effective analgesic for pain of nociceptive and

neuropathic origin.<sup>10</sup> The present study was conducted to compare tramadol versus ketorolac for pain management after third molar surgery.

We found that mean age in group I was 21.3 years, in group II was 21.5 years and in group III was 20.4 years. Time taken for surgery was 29.1 minutes in group I, 28.5 minutes in group II and 22.3 minutes in group III. Deshpande et al<sup>11</sup> involved Group T (tramadol 1 mg/kg), Group K (ketamine 0.5 mg/kg), and Group C (saline 2 mL). The VAS scores after extraction were statistically higher in Group C than in either treatment group. Group T had the lowest pain intensity. During the 1st 6 h, patients reported statistically lower pain intensity scores in Groups T and K versus Group C. At 24 h, Group T had the lowest pain intensity and Group K had less pain than Group C. The number of analgesics taken in the 1st 24 h was highest in Group C.

We found that mean VAS at 1<sup>st</sup> hour was 5.4, 5.9 and 5.7, at 6<sup>th</sup> hour was 2.6, 2.7 and 3.6 and at 24<sup>th</sup> hour was 1.2, 1.7 and 3.2 in group I, II and III respectively. Gonul et al<sup>12</sup> compared the analgesic efficacy of postoperative tramadol versus Ketorolac for preventing pain after mandibular molar extraction. Ninety patients who had undergone molar extraction were randomly divided into 3 groups: group T (tramadol 1 mg/kg), group K (ketamine 0.5 mg/kg), and group P (saline 2 mL). The treatment was applied to the extraction sockets using resorbable gelatin sponges. Pain after extraction was evaluated using a visual analog scale (VAS) 0.5, 1, 2, 4, 6, 12, 24, and 48 hours postoperatively. The VAS scores after extraction were statistically higher in group K than in either treatment group. Group T had the lowest pain intensity. Slatkin et al<sup>13</sup> reported that Tramadol decreased pain in a patient with radiation-induced oral mucositis; the ketamine was prescribed as an oral rinse for 1 week. The drawback of our study is small sample size.

## CONCLUSION

Authors found that tramadol is superior than ketamine and saline in reducing pain after mandibular third molar surgery.

## REFERENCES

- Collins M, Young I, Sweeney P, Fenn GC, Stratford ME, Wilson A, et al. The effect of tramadol on dento-alveolar surgical pain. *Br J Oral Maxillofac Surg* 1997;35:54-8.
- Keats AS. The ASA classification of physical status – A recapitulation. *Anesthesiology* 1978;49:233-6.
- Satılmış T, Garip H, Arpacı E, Şener C, Goker K. Assessment of combined local anesthesia and ketamine for pain, swelling, and trismus after surgical extraction of third molars. *J Oral Maxillofac Surg* 2009;67:1206-10.
- 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.
- Scott LJ, Perry CM. Tramadol: A review of its use in perioperative pain. *Drugs* 2000;60:139-76.
- Danic P, Salaric I, Macan D. New findings on local tramadol use in oral surgery. *Acta Stomatol Croat* 2017;51:336-44.
- Precheur HV. In: Miloro M, Larsen PE, Ghali GE, Waite PD, editors. *Peterson's Principles of Oral and Maxillofacial Surgery*. BC Decker, Inc., Hamilton (Canada) and London (UK) (2004): Mosby; 2005. p. 1502.
- Kronenberg RH. Ketamine as an analgesic: Parenteral, oral, rectal, subcutaneous, transdermal and intranasal administration. *J Pain Palliat Care Pharmacother* 2002;16:27-35.
- Craven MJ. Genetic algorithms for word problems in partially commutative groups. In: *Evolutionary Computation in Combinatorial Optimization*. Berlin Heidelberg: Springer; 2007;48-59.
- Collins M, Young I, Sweeney P, et al: The effect of tramadol on dento-alveolar surgical pain. *Br J Oral Maxillofac Surg* 1997; 35:54.
- Deshpande AA, Hemavathy OR, Krishnan S, Ahmed R. Comparison of effect of intra socket ketamine and tramadol on postoperative pain after mandibular third molar surgery. *Natl J Maxillofac Surg* 2022;13:95-8.
- Gönül O, Satılmış T, Ciftci A, Sipahi A, Garip H, Göker K. Comparison of the effects of topical ketamine and tramadol on postoperative pain after mandibular molar extraction. *Journal of Oral and Maxillofacial Surgery*. 2015 Nov 1;73(11):2103-7.
- Slatkin NE, Rhiner M: Topical ketamine in the treatment of mucositis pain. *Pain Med* 2003; 4:298.