

Original Research

Assessment of efficacy of Tapentadol and ketorolac in mandibular third molar surgery

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ABSTRACT:

Background: To assess the efficacy of tapentadol and ketorolac in mandibular third molar surgery. **Materials & methods:** A total of 20 subjects who required surgical extraction of impacted mandibular third molars were enrolled. The patients were randomly divided into two groups. Patients were divided into Group A and B as 10 in each group. Pain intensity was recorded at 1 h, 10 h, 1 day and 3 day after the procedure using the visual analog scale. **Results:** Pain level was measured in categories. The results were depicted 1hour, 10 hours after surgery, 1st and 3rd days postoperatively. The results show that there is no statistically significant difference between the two treatment groups (P = 0.12). **Conclusion:** Ketorolac is more effective for immediate pain reduction than tapentadol but there is no significant difference between groups.

Keywords: ketorolac, third molar, surgery.

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INTRODUCTION

Pain is the most common complaint of the human beings. Dental pain specifically third molar extraction is said to be one of the most acute postsurgical painful conditions. ¹Extractions of the third molars account for a large volume of cases in contemporary oral surgical practice and require much planning and surgical skill during both preoperative diagnosis and postoperative management. ² The pain experienced following the third molar surgery under local anesthesia has been shown to be of short duration and reaches its maximum intensity in the early postoperative period and in the most cases, patients require some form of analgesic to deal with it. ³

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.⁴ It is often associated with swelling, pain, and trismus.⁵ Pain associated with surgical removal of mandibular third molars ranges between moderate and severe during

the first 24 hours (h) after surgery, with the major pain intensity occurring between 6 and 8 h when a conventional local anesthetic is used. ⁶Preoperative administration of some analgesics has demonstrated reducing the onset of postoperative pain.⁴ It has been suggested that preemptive analgesia (analgesia given before the painful stimulus begins) is an alternative for treating the postsurgical pain of third molar removal. ⁷Ketorolac is an NSAID that has showed to be effective after oral and parenteral administration. This drug produces its effect through inhibiting synthesis of prostaglandins, the fatty acid that promotes pain.⁸⁻¹⁰ Additional mechanisms of action have been proposed to explain the efficacy and high potency of ketorolac, including a modulator effect on opioid receptors and stimulation of nitric oxide release.^{8,11} Tramadol is an opioid analgesic effective in treating moderate to severe pain. It has a low addiction potential. It is used against multiple acute pain conditions, including postsurgical pain.¹² It acts on opioid receptors and seems to modify the

transmission of pain, inhibiting the reuptake of serotonin and noradrenaline.¹³ Hence, this study was conducted to assess the efficacy of tapentadol and ketorolac in mandibular third molar surgery.

MATERIALS & METHODS

A total of 20 subjects who required surgical extraction of impacted mandibular third molars were enrolled. The patients were randomly divided into two groups. Patients were divided into Group A and B as 10 in each group. Group A patients were given ketorolac 10 mg BD, and Group B patients were given tapentadol 50 mg BD postoperatively. Patients were asked to take medicine 1 h after the surgery in both groups. Pain intensity was recorded at 1 h, 10 h, 1 day and 3 day after the procedure using the visual analog scale. The patients were recalled at the 7th day postoperatively for suture removal. The result was analysed using SPSS software.

RESULTS

A total of 20 subjects were enrolled. Pain level was measured in categories. The results were depicted 1hour, 10 hours after surgery, 1st and 3rd days postoperatively. The results show that there is no statistically significant difference between the two treatment groups (P = 0.12). According to results, there is no significant group by time interaction, which means both drugs have shown almost equal efficacy at different time points.

Table 1: one hour after surgery

Drugs	Comparison after 1 hr									
Tablet ketorolac	7	5	6	8	6	8	7	6	7	
Tablet tapentadol	6	6	6	6	6	8	6	7	7	

Table 2: ten hours after surgery

Drugs	Comparison after 10 hr									
Tablet ketorolac	4	4	2	3	2	3	4	5	3	2
Tablet tapentadol	4	6	4	5	4	5	4	6	4	4

Table 3: First postoperative day

Drugs	Comparison after 1 st day									
Tablet ketorolac	2	1	2	2	3	2	3	2	1	1
Tablet tapentadol	3	4	4	2	2	3	3	4	3	2

Table 4: Third postoperative day

Drugs	Comparison after 3rd day									
Tablet ketorolac	1	0	0	0	0	0	0	0	0	0
Tablet tapentadol	0	2	0	0	1	0	2	0	0	1

DISCUSSION

Tapentadol is a centrally acting analgesic with a dual mode of action (i.e., m-opioid receptor agonism and norepinephrine uptake inhibition), distinguishing it from other commercially available opioids.¹⁴ Opioid receptor binding has shown that tapentadol has higher binding affinity to m-opioid receptors than for delta(d)- and kappa(k)-opioid receptors. Ketorolac having prolonged analgesic activity has neither sedative nor anxiolytic properties. Ketorolac does appear to have a significant analgesic efficacy and has been used successfully to replace opioid in some situation involving mild-to-moderate postsurgical pain.¹⁵ Hence, this study was conducted to assess the efficacy of tapentadol and ketorolac in mandibular third molar surgery.

In the present study, a total of 20 subjects were enrolled. Pain level was measured in categories. The results were depicted 1hour, 10 hours after surgery, 1st and 3rd days postoperatively. The results show that there is no statistically significant difference between the two treatment groups (P = 0.12). A study by Shah D et al, studied 32 patients, 16 were allocated to receive ketorolac and 16 patients were allocated to receive tapentadol. As the data for a study were collected at different time points, analysis for the longitudinal study was done. The main outcome variable, pain level was measured in five-ordered categories. They showed that there is no statistically significant difference between the two treatment groups (P = 0.1184). Similarly, there is no difference in efficacy of the two drugs across gender level.¹⁶

In the present study, there is no significant group by time interaction, which means both drugs have shown almost equal efficacy at different time points. Another study by Shah AV et al, studied the investigating the existence of pre-emptive analgesia and to compare the pre-emptive analgesic efficacy of im ketorolac [NSAID] versus tramadol [SYNTHETIC OPIOD] for post-operative pain management following third molar surgery. Fifty patients under the age group of 16-25 years with asymptomatic, symmetrically impacted mandibular third molars were equally divided into 2 groups and underwent third molar surgery under local anesthesia. Ketorolac 30 mg and tramadol 50 mg were used in the study group, while sodium chloride 0.9 % was used in the control group. Study parameters included pain intensity scores for 12 post-operative hours, time to 1st rescue analgesia, total number of analgesics consumed during the 5 post-operative days and patients' self assessment of efficacy of the surgery with regardsto no pain. Statistically, the data are presented as the mean values with their standard deviations and a 95 % confidence interval [p is significant, if p < 0.05] for the mean are applicable. Incidences of adverse events like pain on injection of the study drug, local reactions, nausea and vomiting were noted. Patients in the study group significantly performed better than the control group in terms of all the parameters; while among the study

group, ketorolac fared better than tramadol. Pre-operative ketorolac or tramadol in comparison to placebo resulted in a significantly better post-operative pain management. However as against tramadol, ketorolac is a better choice as a pre-emptive analgesic agent for the post-operative pain management following third molar surgery.¹⁷ Gopalraju et al., compared the intravenous analgesia of 30 mg of ketorolac and 50 mg of tramadol after third molar surgery, proving ketorolac to produce better control of pain.¹⁸ Mishra et al., carried out a double-blind, randomized, clinical trial evaluating the analgesic efficacy of both drug and concluded that the postoperative administration of 100 mg of tramadol is as effective as 20 mg of ketorolac in the relief of pain.¹⁹ Shah et al., and Ong et al., made two separate clinical studies to assess the preemptive analgesic effectiveness of 30 mg of ketorolac and 50 mg of tramadol using intramuscular and intravenous administration respectively, and informed that ketorolac is better than tramadol for management of pain prior to oral surgery.^{20,21}

CONCLUSION

Ketorolac is more effective for immediate pain reduction than tapentadol but there is no significant difference between groups.

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