

Original Research

Assessment of effect of intra-socket ketamine and tramadol in third molar surgery

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ABSTRACT:

Background: Post-surgery pain control after third molar surgery may lead to improved recovery in terms of lifestyle and oral function. The present study was conducted to compare effect of intra-socket ketamine and tramadol in third molar surgery. **Materials & Methods:** 45 patients who had undergone unilateral mandibular third molar surgery of both genders were divided into 3 groups of 15 each. Group I received Tramadol 1 mg/kg diluted with saline to 2 ml, group II received Ketamine 0.5 mg/kg diluted with saline to 2 ml and group III received saline 2 ml. Pain after the surgical procedure was evaluated using a visual analog scale (VAS) on 1st hour, 6th hour and 24th 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 1st hour was 5.4, 5.7 and 5.5, at 6th hour was 2.3, 2.8 and 3.7 and at 24th 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 found to be superior as compared to ketamine and saline in management of third molar surgery in reducing pain.

Key words: Tramadol, Ketamine, Pain

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INTRODUCTION

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.¹

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.² 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. The various analgesics used intravenous (IV) techniques are ketorolac, tramadol, paracetamol, nalbuphine, and buprenorphine.³ Tramadol is a centrally acting, synthetic opioid analgesic with low affinity for opioid receptors. It is

structurally identical to the morphine and codeine.⁴ 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. Ketamine is an anesthetic agent with analgesic efficacy at subanesthetic dosage. It is an effective analgesic for pain of nociceptive and neuropathic origin.⁵ The present study was conducted to compare effect of intra-socket ketamine and tramadol in third molar surgery.

MATERIALS & METHODS

The present study comprised of 45 patients who had undergone unilateral mandibular third molar surgery of both genders. The consent was obtained from all enrolled patients. Data such as name, age, gender etc. was recorded. Patients were divided into 3 groups of 15 each.

Group I received Tramadol 1 mg/kg diluted with saline to 2 ml, group II received Ketamine 0.5 mg/kg diluted with saline to 2 ml and group III received saline 2 ml. All the patients were operated by a single operator and the average time taken to perform the surgery was recorded. Maximum 2 ml of 2% lignocaine with 1:100,000 adrenaline was used and classical inferior alveolar nerve block technique was

used for local anesthesia in Ward's incision was used for flap reflection and all the cases required bone cutting for the exposure of the tooth. Pain after the surgical procedure was evaluated using a visual analog scale (VAS) on 1st hour, 6th hour and 24th hour. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Distribution of patients

Total- 45		
Gender	Males	Females
Number	25	20

Table I shows that out of 45 patients, males were 25 and females were 20.

Table II Assessment of parameters

Parameters	Group I	Group II	Group III	P value
Mean age (years)	21.3	22.5	20.6	0.91
Time taken for surgery (mins)	28.1	27.5	21.3	0.05

Table II, graph I shows that 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).

Graph I Assessment of parameters

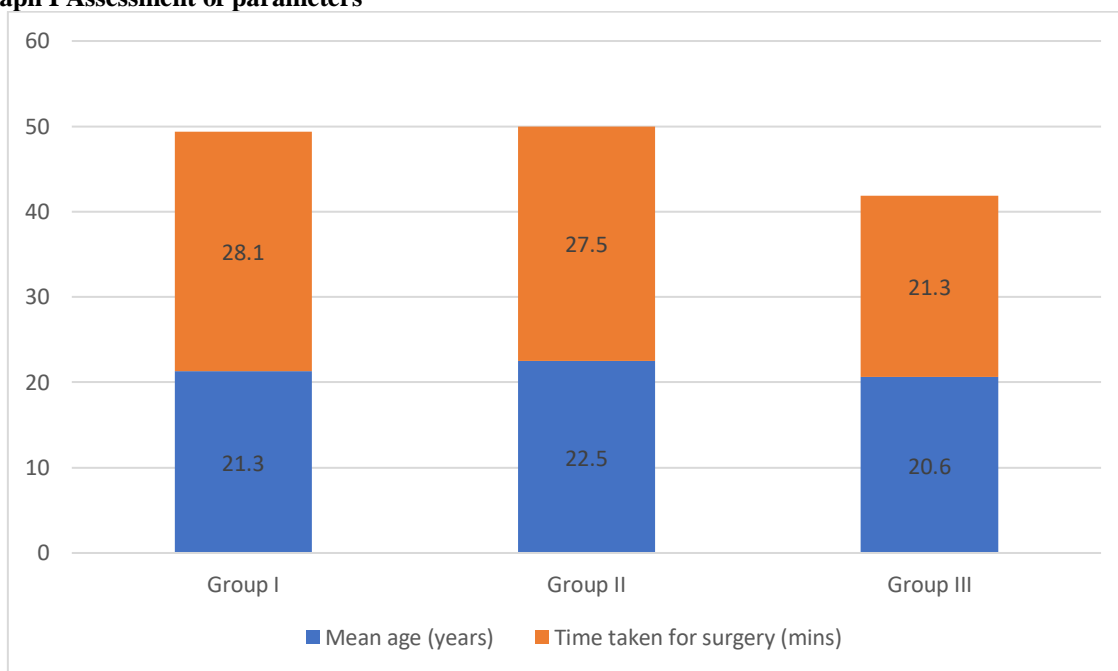
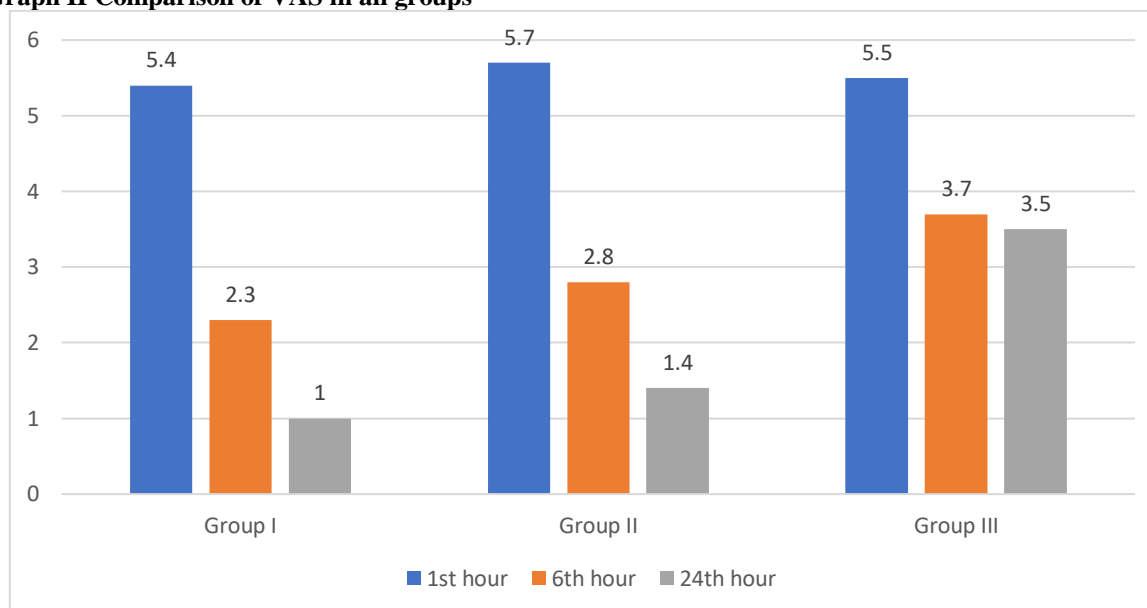


Table II Comparison of VAS in all groups

VAS	Group I	Group II	Group III	P value
1 st hour	5.4	5.7	5.5	0.91
6 th hour	2.3	2.8	3.7	0.02
24 th hour	1.0	1.4	3.5	0.01

Table III, graph II shows that mean VAS at 1st hour was 5.4, 5.7 and 5.5, at 6th hour was 2.3, 2.8 and 3.7 and at 24th hour was 1.0, 1.4 and 3.5 in group I, II and III respectively. The difference was significant (P< 0.05).

Graph II Comparison of VAS in all groups

DISCUSSION

Pain is a major symptom after many dental procedures, especially tooth extractions, and its management is a challenging part of dentistry.⁶ For years researchers have sought the best analgesia after tooth extractions. Tramadol hydrochloride is a synthetic, centrally acting analgesic with a low affinity for opioid receptors. Structurally, it is related to codeine and morphine.⁷ Tramadol is effective for treating moderate to severe pain, including postsurgical, obstetric, and terminal cancer pain and pain of coronary origin.⁸ 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.⁹ The present study was conducted to compare effect of intra-socket ketamine and tramadol in third molar surgery.

We found that out of 45 patients, males were 25 and females were 20. Gonul et al¹⁰ compared the analgesic efficacy of postoperative tramadol versus ketamine 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 P than in either treatment group. Group K had the lowest pain intensity.

We found that 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. Deshpande et al¹¹ compared the analgesic efficacy of intra socket application of tramadol versus ketamine for preventing pain after mandibular third molar surgery. Thirty patients who had undergone third molar surgery were randomly divided into three groups: Group T (tramadol 1 mg/kg), Group K (ketamine 0.5 mg/kg), and Group C (saline 2 mL). The treatment was applied to the extraction sockets using resorbable gel foam. Average time taken for the procedure was recorded. Pain was evaluated postoperatively using a visual analog scale (VAS) at 6 and 24 h postoperatively. Furthermore, the number of analgesics taken in the 1st 24 h was recorded. The VAS scores after extraction were statistically higher in Group C than in either treatment group. Group K had the lowest pain intensity. During the 1st 6 h, patients reported statistically lower pain intensity scores in Groups K and T versus Group C. At 24 h, Group K had the lowest pain intensity and Group T had less pain than Group C. The number of analgesics taken in the 1st 24 h was highest in Group C.

We observed that the mean VAS at 1st hour was 5.4, 5.7 and 5.5, at 6th hour was 2.3, 2.8 and 3.7 and at 24th hour was 1.0, 1.4 and 3.5 in group I, II and III respectively. Slatkin et al¹² reported that ketamine decreased pain in a patient with radiation-induced oral mucositis; the ketamine was prescribed as an oral rinse for 1 week. Other studies used ketamine topically after tonsillectomy; the treatment produced an analgesic effect and decreased the need for rescue medication. Collins et al¹³ assessed the analgesic effect of tramadol for the relief of pain after dentoalveolar operations that involved the removal of bone and suturing. The treatment resulted in complete pain relief, and this continued for the next 2 days. No serious or unexpected adverse effects were

reported and they concluded that tramadol is an effective analgesic after dentoalveolar operations.

The drawback of our study is small sample size and only two medicaments were compared.

CONCLUSION

Authors found that tramadol found to be superior as compared to ketamine and saline in management of third molar surgery in reducing pain.

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