Section: Anaesthesia

Original Research Article

POST-OPERATIVE EPIDURAL ANALGESIA WITH TRAMADOL (50 MG VS 100 MG) WITH ROPIVACAINE IN LOWER ABDOMINAL SURGERY

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Abstract

Background: Post-operative pain is a major concern for patients undergoing abdominal surgery. Persistent pain causes negative impact of patient experience of treatment and tends to increase the duration of the hospital stay. Ropivacaine is a long-acting amide local anesthetic and tramadol is a pain relief medication used to provide the postoperative pain relief after surgeries. **Objective:** Present study was aim to compare the post-operative epidural analgesia with tramadol (50 mg vs 100 mg) with ropivacaine in lower abdominal surgery for providing pain relief, hemodynamics stability, and postoperative complications. **Material and Methods:** Total 78 patients undergoing lower abdominal surgeries were randomly divided into two groups: group A patients were administrated with 50 mg tramadol + ropivacaine whereas group B patients were administrated with 100 mg tramadol + ropivacaine. Postoperative pain and hemodynamics were compared between two group at 1h, 6h, 12h and 24h of time interval. Postoperative complications were also compared between the two groups. **Results:** *Most of* patients belong to 4th and 5th decade of life with predominance of males. The mean pain score was lower in patients of group B as compared to the group A at 6h, 12h and 24h of postoperative duration. Sedation was significantly higher in group B as compared to the group A. Pulse rate and SPO2 showed no significant difference between two groups whereas mean atrial pressure was significantly lower in group B. Shivering was the most common side effect followed by headache, vomiting and nausea with no significant difference between the two groups. **Conclusion:** A higher dose of tramadol (100 mg) provided the superior pain relief with hemodynamic stability and without any additional side effects. Further studies with large sample size need to be conducted to established the appropriate dose of tramadol for lower abdominal surgeries.

INTRODUCTION

A sizeable segment of the populace has experienced one or more surgical operations at some point in their lives. With an estimated 234 million procedures carried out annually, surgery has become a crucial component of healthcare worldwide. Surgically curable diseases accounted for an estimated 164 million disability-adjusted life years in 2002, or 11% of all disease cases.[1] The clinical scope and outcomes of emergency abdominal procedures performed by specialist facilities in India are not well documented. Small intestinal emergencies accounted for 26.5% of indications, with pancreatic and colonic emergencies coming in second and third, respectively, at 18.5% and 12.5%. Additional illnesses requiring emergency surgery included postoperative complications from elective procedures (7.5%), bleeding or perforation in the stomach (6.3%), and liver surgery (4.1%).[2]

Even with several clinical technological developments, managing post-operative pain remains difficult and frequently untreated, which causes worry, tension, and unsatisfaction among patients. Inadequate pain management can have negative physiological consequences in addition to negative psychological, economic, and societal repercussions.[3] Severe abdominal pain following major abdominal procedures involving incisions in the abdomen can result in atelectasis, retention of secretions, shallow breathing, and resistance to physiotherapy if not properly managed. This causes

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a delay in recovery and raises the risk of post-operative morbidity. During major abdominal operations in India, the primary anesthesiologist in charge of the patient care in the operating room makes the decision about the post-operative analgesic modality to be used. The decision is primarily based on the anesthesiologist preferred approach and the supply of medications and equipment.[4]

Adjuvant medication addition to local anesthetics in regional anesthesia has been the subject of several investigations to date. The findings of these studies have varied depending on the kind of operation, drug dosage, and varying concentrations of local anesthetics and adjuvants. Tramadol or fentanyl added to local anesthetics in the axillary plexus block has sped up the start of sensory and motor blockade, shortened its duration, and decreased the pain score in comparison to other drugs.[5] Tramadol increases the inhibitory effects on pain transmission in the spinal cord by inhibiting the absorption of norepinephrine and serotonin. Tramadol has agonistic action when it interacts with μ, δ, and κ receptors. Its affinity for the μ receptor is considerable, but its affinity for the delta and Kappa receptors is minimal.[6]

In developed as well as developing countries, there is seen to be room for great improvement in pain management with serious efforts. These initiatives are critical because modifying surgical stress responses through adequate pain management is a potent strategy for improving surgical outcomes. Therefore, present study was conducted to compare the post-operative epidural analgesia with tramadol (50 mg vs 100 mg) with ropivacaine in lower abdominal surgery for providing pain relief, hemodynamics stability, and postoperative complications.

MATERIALS AND METHODS

Study Design: Total 78 patients undergoing lower abdominal surgeries were randomly divided into two groups: group A patients were administrated with 50 mg tramadol + ropivacaine whereas group B patients were administrated with 100 mg tramadol + ropivacaine. Postoperative pain and hemodynamics were compared between two group at 1h, 6h, 12h and 24h of time interval. Postoperative complications were also compared between the two groups. Appropriate ethical guidelines were followed while conducting this study.

Pain Assessment: Visual analogue scale (VAS) score was used to assessed the pain. The value of VAS score could range from 0 to 10 with 0 representing no pain and 10 representing the worst pain. The patients were asked to rate the severity of pain from 0 to 10 and response were recorded on the case record proforma.

Sedation: Sedation was assessed by modified Ramsay sedation score. The sedation score value range from 0 to 6 with 0 representing that the patients is awake, cooperative, oriented and tranquil whereas 6 representing that the patient is asleep, no response to glabellar tap or to loud auditory stimulus. The score was recorded on the case record proforma.

Statistical Analysis: Data was analyze using the SPSS 27.0 software. Mean and standard deviation was calculated for continuous variables whereas number and percentage were calculated for categorical variables. Unpaired t-test was used to compared two continuous variables whereas chi-square test was used to compare categorical variable. All testes were performed by taking the p value<0.05 as statistically significant.

RESULTS

The mean age of the patients in group A was 47.92 ± 19.03 years and in group B was 51.97± 19.75 with no significant difference in the mean age of two groups. There was a male predominance in both the groups. Group A has 21 (53.85%) male and 18 (46.15%) females whereas group B has 22 (56.41%) males and 17 (43.59%) females. The mean body weight was 60.69 ± 9.887 kg in group A and 62.87 ± 8.823 in group B with no significant difference. Mean duration of surgery was 94.23 ± 14.66 min in group A and 94.00 ± 15.22 min in group B with difference being insignificant. [Table 1]

The mean pain score was lower in patients of group B as compared to the group A at 6h, 12h and 24h of postoperative duration. Mean pain score in group A and B respectively was 5.49 ± 1.233 and 5.46 ± 1.022 at 1 hour, 5.15 ± 1.014 and 4.21 ± 1.056 at 6 hours, 4.23 ± 1.012 and 2.9 ± 0.788 at 12 hours, and 2.46 ± 0.79 and 1.18 ± 0.721 at 24 hours. [Figure 1]

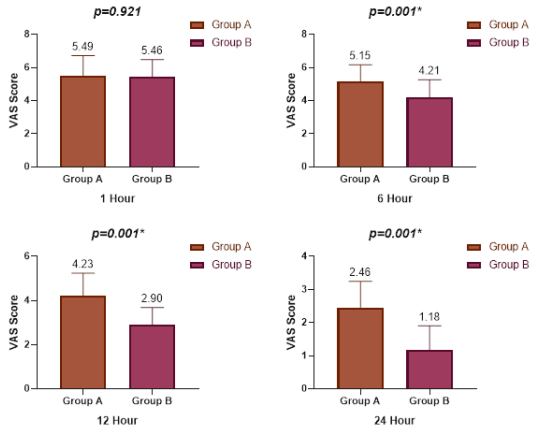

Figure 1: Mean pain score at 1h, 6h, 12h, and 24h of postoperative duration

Sedation was significantly higher in group B as compared to the group A. Mean sedation score in group A and B respectively was 2.97 ± 0.873 and 3.77 ± 0.81 at 1 hour, 2.13 ± 0.695 and 2.97 ± 0.778 at 6 hours, 0.79 ± 0.864 and 1.9 ± 0.68 at 12 hours,

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and 0.21 ± 0.409 and 1 ± 0.795 at 24 hours. [Figure 2]

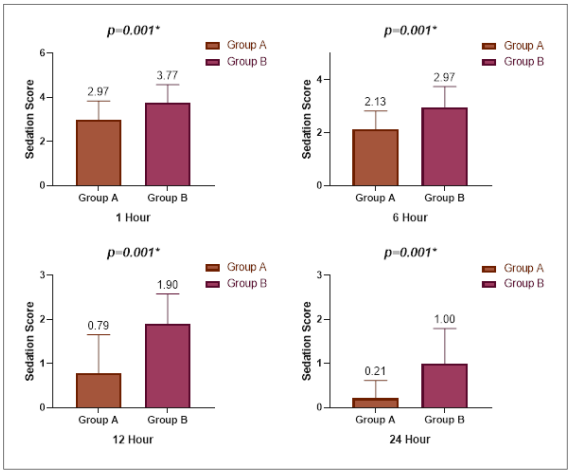

Figure 2: Mean sedation score at 1h, 6h, 12h, and 24h of postoperative duration

Pulse rate showed no significant difference between two groups at 1h, 6h and 12h of postoperative duration, however, pulse rate was significantly low in group A at 24h. The mean pulse rate in group A and B respectively was 85.1 ± 3.119 and 84.79 ± 2.894 at 1 hour, 85.36 ± 2.969 and 84.9 ± 3.202 at 6 hours, 84.87 ± 3.396 and 84.72 ± 3.576 at 12 hours, and 84.33 ± 2.649 and 85.77 ± 2.969 at 24 hours. [Figure 3]

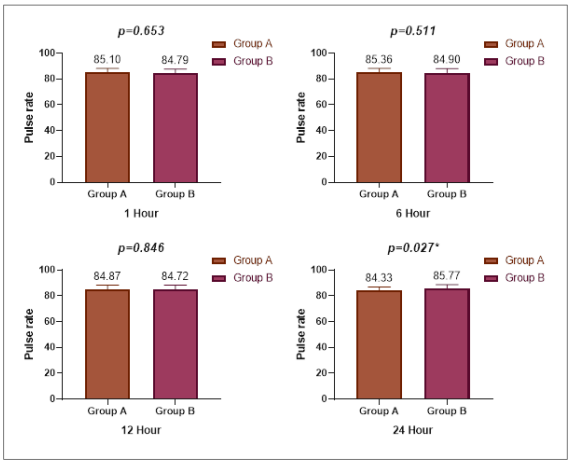

Figure 3: Mean pulse rate at 1h, 6h, 12h, and 24h of postoperative duration.

The mean atrial pressure was significantly lower in group B as compared to group A. The mean atrial pressure in group A and B respectively was 88.54 ± 2.87 and 82.54 ± 3.05 at 1 hour, 88.41 ± 2.96 and 83.74 ± 3.42 at 6 hours, 88.26 ± 2.84 and 83.79 ± 3.08 at 12 hours, and 88.56 ± 3.24 and 83.15 ± 3.48 at 24 hours. [Figure 4]

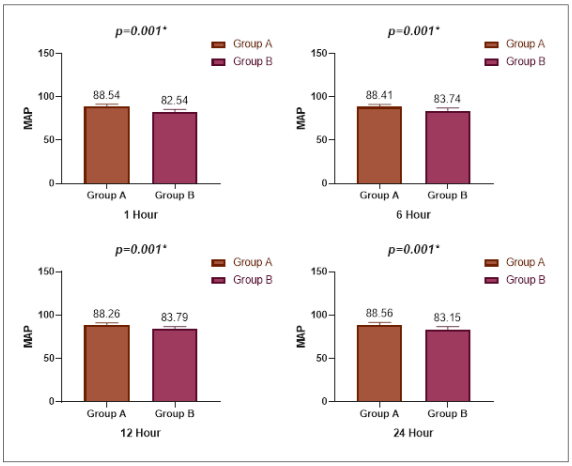

Figure 4: Mean atrial pressure at 1h, 6h, 12h, and 24h of postoperative duration.

Mean SPO2 showed no significant difference between two groups at any time interval of postoperative duration. The mean SPO2 in group A and B respectively was 97.03 ± 0.62 and 96.95 ± 0.56 at 1 hour, 97.12 ± 0.54 and 97.21 ± 0.63 at 6 hours, 96.92 ± 0.59 and 96.81 ± 0.57 at 12 hours, and 97.07 ± 0.66 and 97.12 ± 0.60 at 24 hours. [Figure 5]

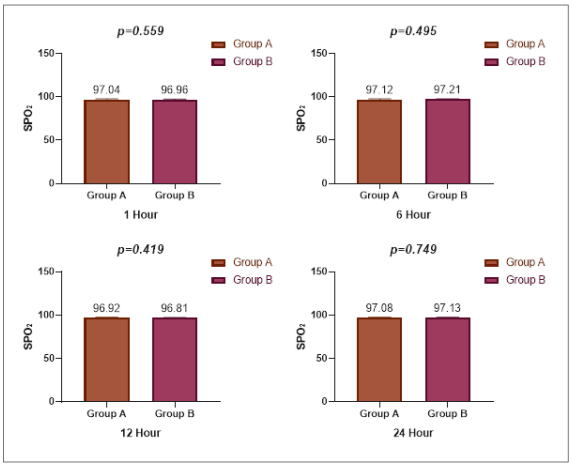

Figure 5: Mean SPO2 at 1h, 6h, 12h, and 24h of postoperative duration.

Shivering was the most common side effect followed by headache, vomiting and nausea with no significant difference between the two groups. In group and B respectively, shivering occurred in 25 (64.1%) and 26 (66.67%) patients, headache occurred in 4 (10.26%) and 7 (17.95%) patients, vomiting occurred in 3 (7.69%) and 3 (7.69%) patients, and nausea occurred in 2 (5.13%) and 3 (7.69%) patients. [Table 2]

Table 1: Age and gender distribution, body weight and duration of surgery

Variable	Domain	Group A	Group B	P value
Mean age		47.92 ± 19.03	51.97± 19.75	0.359
Gender	Male	21 (53.85%)	22 (56.41%)	0.365
	Female	18 (46.15%)	17 (43.59%)	
Body weight		60.69 ± 9.887	62.87 ± 8.823	0.308

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Duration of surgery		94.23 ± 14.66	94.00 ± 15.22	0.946

Table 2: Side effects of tramadol in group A and B

Side effects	Group A	Group B	P value
Shivering	25 (64.1%)	26 (66.67%)	0.196
Headache	4 (10.26%)	7 (17.95%)	
Vomiting	3 (7.69%)	3 (7.69%)	
Nausea	2 (5.13%)	3 (7.69%)	
No side effects	5 (12.82%)	0	

DISCUSSION

It is commonly acknowledged that the most effective method of treating pain after lower abdominal surgery is epidural analgesia. Without the negative effects that come with opioids, analgesia with an epidural has been compared to, or even better than, that of those medications. The mainstay has been long-acting local anesthetics such as bupivacaine; yet, serious cardiotoxicity and motor block have remained important concerns. India has adopted ropivacaine into clinical practice as its USP because to its improved safety profile. Furthermore, ropivacaine has negligible motor block, making it the perfect option for epidural analgesia—pain treatment without impeding early ambulation. When used as an adjuvant in small dosages, opioids such as Tramadol can prolong analgesia and reduce the need for frequent top-ups.[7]

Most of patients belong to 4th and 5th decade of life with predominance of males. Similar observations have been made in the study by Sadhu et al., in which most of patients belong to 4th decade of life.[7] In the study by Gebremedhin et al., most of patients belong to 4th decade of life with a predominance of males.[8] In the study by Timilsina et al., most of patients belong to 5th decade of life.[9] Pulse rate and SPO2 showed no significant difference between two groups whereas mean atrial pressure was significantly lower in group B. In the study by Sadhu et al., mean pulse rates and SPO2 in the two groups were comparable and group with higher dose of tramadol had a higher mean arterial pressure.[7]

The mean pain score was lower in patients of group B as compared to the group A at 6h, 12h and 24h of postoperative duration. However, Sadhu et al., observed that VAS scores recorded at rest, on movement & on coughing in both the groups were comparable and the differences were not significant.[7] In the study by Gebremedhin et al., a significant reduction in the postoperative pain severity score was observed in the tramadol group.[8] In the study by Timilsina et al., postoperative pain was significantly lower in the tramadol group as compared to the placebo group.[9] Sedation was significantly higher in group B as compared to the Group A. Similar observations have been made in the study by Sadhu et al., in which mean sedation scores revealed higher sedation & amnesia levels in group with higher dose of tramadol.[7]

Shivering was the most common side effect followed by headache, vomiting and nausea with no significant difference between the two groups. Similar observations have been made in the study by Sadhu et al., in which side effect profile in the two groups was comparable and did not reveal any significant difference.[7] In the study by Gebremedhin et al., the incidence of postoperative complications, such as nausea and vomiting, hypotension, and other postoperative vital signs, among the two groups was not significant.[8] Similarly, a study done by Sachidananda et al., showed that the incidence of postoperative nausea and vomiting over 24 h in the tramadol group was 20% lower than that in the non-tramadol group (29.9%) with no significant difference.[10]

The major limitation of the study is the small sample size. Apart from this, this study involved patients with wide range of age thus do not rule out the age specific tolerance to pain. This study involved patients with different diagnosis and surgical procedures, so intensity of pain varies accordingly which may influence effective duration of spinal anesthesia. Moreover, we do not analyze the level of block obtained is not analysed.

CONCLUSION

A higher dose of tramadol (100 mg) provided the superior pain relief with hemodynamic stability and without any additional side effects. It is recommended that postoperative pain should be assessed in all patients undergoing the abdominal surgeries to standardize the dose of tramadol for patients. Further studies with large sample size need to be conducted to established the appropriate dose of tramadol for lower abdominal surgeries.

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