ORIGINAL ARTICLE

Comparison of lumbar epidural bupivacaine with and without tramadol for postoperative analgesia in lower abdominal surgeries

Saleem Sabbar, Fawad Ahmed Khan, Javed Ahmad

Abstract

Objective:

The aim of the study was to compare the postoperative analgesic efficacy of lumbar epidural bupivacaine with and without tramadol for postoperative analgesia in lower abdominal surgeries.

Study design: Quasi experimental

Place and duration of surgery: This study was conducted at Anaesthesia Department of Lyari General Hospital Karachi over a period of 12 months from October 2008 to October 2009.

Patients and methods: In this study, sixty patients were equally divided into two groups. Group I (n=30) received 0.5 % bupivacaine 20 ml epidurally and group II (n=30) received 0.5 % bupivacaine 20 ml and inj tramadol 1.5 mg/kg epidurally. There was no significant difference in age, weight and sex of the patients. Data from the patients was recorded on a proforma. The comparison was made between group I and group II. Analgesic efficacy of group I and II was determined by visual analogue scale (VAS) on arrival and then 2 hourly for 12 hours and then 4 hourly.

Result: Out of 60 patients there were 38 males and 22 females with male to female ratio of 1.72: 1. The mean age of the patients in group I was 45.07±10.04 while in group II it was 47.25±8.7. The mean weight of the patients in group I was 61.31±9.90 while in group II it was 63.78± 8.9. The duration of postoperative analgesia in group I was 3.8±0.28 and in group II it was 7.60±0.31.

Conclusion: Addition of tramadol 1.5 mg/kg to 0.5 % bupivaciane, given epidurally, produces prolonged postoperative analgesia as compared to bupivacaine alone in patients undergoing lower abdominal surgeries.

Key Words: Epidural, Tramadol, Postoperative Analgesia, Bupivacaine

Department of Anaesthesia ICU, Dow International Medical College, Dow University of Health Sciences, Karachi
S Sabbar

Sindh Govt Lyari General Hospital, Karachi
F A Khan

Department of Surgery , Dow Medical College, Dow University of Health Sciences, Karachi
J Ahmad

Correspondence:
Name: Dr Saleem Sabbar
Address: Dow International Medical College, Dow University of Health Sciences, Karachi.
Cell: 0333-3392043

Introduction:

Management of postoperative pain is one of the most challenging and gratifying domains of anaesthesia. It has a negative impact on surgical outcome and its management is the most challenging domain of anaesthesia. The effective relief of pain is of paramount importance to anyone treating patients undergoing surgery. This should be achieved for humanitarian reasons, but there is now evidence that pain relief has significant physiological benefit. Increasing the effectiveness of post-operative pain management has a tremendous impact on a patient's well-being such as reduced narcotic usage, lower pain scores, higher patient satisfaction and reduced chronic pain syndromes. Regional anaesthesia has played major role in this regard. Regional anaesthesia is being used more and and more for lower abdominal, lower limb and perineal surgeries[1]. Epidural and spinal blocks are major regional techniques with a long histoy of effective use for a variety of surgical procedures and pain relief. Epidural blockade with bupivacaine provides good anaesthesia and analgesia but it

still has its drawbacks such as slower onset of action, high doses required, patchy anaesthesia, high doses leading to cardiovascular and neurotoxicity [2] and time limited analgesia. Addition of opioids like morphine, pethidine and fentanyl to bupivacaine, results in prolonged analgesia but with a higher incidence of nausea, vomiting and respiratory depression [3]. Tramadol, an opioid, has also been used epidurally with bupivacaine in order to treat postoperative pain.

Pharmacologically, tramadol is synthetic 4-phenyl piperidine analogue of codeine without having respiratory depressant effect [4]. Tramadol is a centrally acting analgesic that has a low affinity for opioid receptors and its about 5-10 times less potent than morphine as an analgesic. It inhibits reuptake of norepinephrine and serotonin in the spinal cord and has not been associated with neural toxicity [5]. Its analgesic potency is equal to pethidine and provides effective long lasting analgesia after extradural administration in both adults [6] and children. [7-10]

The aim of this study was to compare the postoperative analgesic efficacy of lumbar epidural bupivacaine with and without tramadol for postoperative analgesia in lower abdominal surgeries.

Patients and methods

This experimental quasi study was conducted in Anaesthesia Department of Lyari General Hospital Karachi, after approval from competent authority, over a period of 12 months from October 2008 to October 2009. Sixty patients belonging to ASA I and II, undergoing elective surgical procedure, were included. The procedure was explained to the patients and informed consent was taken at pre-anaesthetic visit. Patients were reassured to reduce anxiety. Following patients were included and excluded.

Inclusion criteria:

Our inclusion criteria was all males and females of age 18 years and above, undergoing elective lower abdominal surgery and are ASA I and II

Exclusion criteria:

All patients who have refused epidural. All patients with history of allergy to bupivacaine and tramadol; patients with history of bleeding diathesis; patients with history of cardiac failure; infection at site of injection and patients on anticoagulant therapy.

These 60 patients were divided into two groups: Group I and group II. Group I (n=30) received 0.5 % bupivacaine 20 ml epidurally and group II (n=30) received 0.5 % bupivacaine 20 ml and inj tramadol 1.5 mg/kg epidurally.

Intravenous line was taken after receiving patient in operation theatre; monitors were applied; base line readings of heart rate and blood pressure were taken. Ringer lactate was used to preload the patients which was given according to body weight of the patient. The patient was placed in sitting position. After explaining the procedure and taking all aseptic precautions, interspinous space between L2 and L3 was identified and skin overlying was infiltrated with 2 % lidocaine. The epidural space was identified by using the loss of resistance technique with an 18- G Touhy needle and an epidural catheter was advanced 4cm within the epidural space.

In group I 0.5% bupivacaine 20ml in divided doses were injected. Initially 5 ml over 30 seconds then if after 5 minutes the patient is haemodynamically stable another 5 ml of inj bupivacaine 0.5% was injected up to a total of 20 ml. In group II patients were given 0.5 % bupivacaine 5 ml along with inj tramadol 1.5 mg /kg initially and then 5 ml of inj bupivacaine 0.5% in the next dose if the patient is haemodynamically stable.

Patient's visual analogue scale was assessed on arrival and then 2 hourly for 12 hours and then 4 hourly for 24 hours. The observer anaesthetist was blinded to the drug administered. The patients' heart rate, blood pressure and respiratory rate were monitored continuously. Time to the second dose of the study drug, and incidence of side effects were noted.

In Visual Analogue Scale patient indicates the intensity of the pain by drawing a mark on a line

100 millimeter long. It is measured from no pain to the point indicated by the patient and then a numerical value is given. A score of 0 means no pain while score 100 indicates that the patient is in worst pain. The rescue analgesia in the form of top up dose was administered when pain score reached a level of four. Side effects like sedation, nausea and vomiting were also observed in both the groups.

Statistical analysis was done using SPSS version 10 on computer. Values are presented in mean ± standard deviation for variables like age, weight, heart rate and blood pressure. Independent sample t test was applied to compare mean significant difference between groups for age, systolic and diastolic blood pressure, heart rate and pain score with respect to time. Chi-square test was also applied to compare proportion difference among groups for postoperative analgesia. P-value of less than 0.05 was taken as significant and comparison between the study groups was made on the basis of their P values.

Results

These 60 patients were divided into two groups: Group I and group II. Group I (n=30) received 0.5 % bupivacaine 20 ml epidurally and group II (n=30) received 0.5 % bupivacaine 20 ml and inj tramadol 1.5 mg/kg epidurally.

Age, weight and gender distribution were comparable (Table 1). There were no significant changes in heart rate, arterial pressure and oxygen saturation between groups. Out of 60 patients there were 38 males and 22 females with male to female ratio of 1.72: 1. The mean age of the patients in group I was 45.07±10.04 while in group II it was 47.25±8.7. The mean weight of the patients in group I was 61.31±9.90 while in group II it was 63.78± 8.9. The duration of postoperative analgesia in group I was 3.8±0.28 and in group II it was 7.60±0.31. Mean duration of analgesia was significantly high in group II than group I (P=0.0001) as shown in table 2. There was no failure of caudal epidural block. No side effects like respiratory depression, pruritis, urinary retention were found.

Table 1: *Demographic and clinical characteristics of the patients*

Variables	Group I (n=30) Mean±SD	Group II (n=30) Mean±SD
Age (years)	45.07±10.04	47.25±8.7
Weight (kilograms)	61.31±9.90	63.78± 8.9
Heart rate (per min)	91.5±5.23	88.40±7.76
Systolic blood pressure (mm Hg)	118.25±14.87	123.55±7.1
Distolic blood pressure (mm Hg)	77.35±9.91	75.66±8.11
Gender		
Male	20	18
Female	10	12
Male : Female ratio	1.5 :1	1.5 :1
ASA	1 & II	1 & II

Values were considered significant when p < 0.05.
Data presented in mean±standard deviation

Discussion

Lower abdominal surgeries need more relaxation intra operatively and are often associated with moderate to severe postoperative pain. Recognition of this problem has made it desirable to find safe and effective ways to achieve denser block during surgery and increase threshold for postoperative pain. Epidural analgesia can be used to manage intra-operative and post-operative pain associated with a variety of procedures. Epidural analgesia,with or without opiods, has been demonstrated to have several benefits after surgery like effective analgesia without the need for systemic opioids [11], reduced incidence of postoperative respiratory problems and chest infections [12], reduced incidence of postoperative myocardial infarction.[13,14] and a reduced stress response to surgery. [15]

Bupivacaine has been in clinical use since many years and has undergone through scrutiny. Its effectiveness in pain relief and prolonged duration of action has been lauded. Epidural morphine

Table 2: *Comparison of duration of analgesia between groups I and II*

	Group I (n=30) ±SD	Group II (n=30) Mean±SD
Mean Duration of Analgesia (hrs)	3.8±0.28	7.60±0.32
P value	0.1	0.0001

Group I given 0.5 % Bupivacaine
Group II given 0.5 % bupivacaine+Tramadol
Values were considered significant when p < 0.05.
Data presented in mean±standard deviation

and other opioids may offer analgesic advantages compared to bupivacaine alone but incidence of side effects increase with both duration of analgesia and the dose of opioid like morphine.[16]

Lipid solubility of tramadol is comparable to that of other opioids like morphine. It acts similarly in the epidural space but with lesser side effects when administered in the therapeutic range and this distinguishes it from traditional opioids . [17]

In our study tramadol produced clinically and statistically significant analgesia when combined with bupivacaine as compared to bupivacaine alone. There are number of studies which are comparable to the results of our study.

In one study Dellikan and his colleagues found postoperative analgesic period to be 9.36 hours[18]. Siddik Sayyid et al reported postoperative analgesic period to be 4.5±3.1 hours. In our study post operative analgesic effect lasted for 7.6±0.32 hours almost similar to above studies.[19]

Study by Churbasik and his colleagues was also comparable to our study. They documented that the efficacy of tramadol for pain relief through epidural route is well established and when combined with local anaesthetics they augment actions of each other.[20]

In contrast to our study, Grace and fee failed to demonstrate analgesic efficacy of epidurally administered tramadol in patients undergoing total knee replacement [21]. Similary Gunduz and colleagues also found that tramadol did not increase the duration of action of bupivacaine .[22]

In our study there was no significant difference in the haemodynamic parameters between the two groups. Side effects seen were also insignificant which might be because of small number of patients. The use of bupivacaine and tramadol epidurally in patients undergoing lower abdominal surgeries might not be easy without the need to observe them postoperatively in ICU and this factor is also playing a prohibitive role in our country as far as its use is concerned.

Conclusion

It can be concluded that addition of 1.5 mg/kg tramadol to 0.5 % of bupivacaine for lumbar epidural block produces prolonged post operative analgesia in patients undergoing lower abdominal surgeries.

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