

Is Tramadol Better Than Bupivacaine in Reducing Post Operative Pain after Lichtenstien Mesh Hernioplasty When Administered in Wound; A Comparative Study

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Abstract

Objective: To compared effect of bupivacaine with tramadol in reducing post-operative pain.

Material and Methods: This comparative study was conducted in General Surgery Department Gulab Devi Hospital Lahore from July 2021 to December 2021. A total of 50 patient diagnosed as case of inguinal hernia undergoing Lichtenstein mesh hernioplasty were recruited and divided into two equal groups (25 patients in each). In Group A injection tramadol 2mg/kg was injected in deep and superficial tissues of wound postoperatively while in Group B bupivacaine 0.25% (0.2ml/Kg) was injected. No analgesic was injected immediately post operatively. Visual analogue score(VAS) for pain intensity was calculated at 2,3,4,5 and 6 hours postoperatively. Analgesia injection paracetamol was given only when patient demanded or VAS was of 6.

Results: Mean duration of time period between operation and first dose of analgesic in Group A and Group B was 4.60 ± 0.5 hours and 4.16 ± 0.37 hours respectively (p-value 0.001). The effect of locally administered tramadol was more as compared to bupivacaine.

Conclusion: Tramadol when infiltrated in wound post operatively had longer duration of action as compared to bupivacaine 4.60 ± 0.5 hours and 4.16 ± 0.37 hours respectively (p-value 0.001).

Keywords: Tramadol, Bupivacaine, Lichtenstein mesh hernioplasty, Postop wound infiltration, Local anaesthesia.

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Introduction

A hernia is defined as protrusion of viscous or part of viscous from one cavity through weakness of wall.¹ The prevalence of hernia worldwide is 7.7% with most prevalence in Asia (12.7%) and minimum in America (4.7%). It more common in male as compared to female with prevalence of 9.6% in male and 1.3% in female.²

Hernia can be internal or external. Internal hernia are usually congenital and rarely acquired after trauma. External hernia are usually acquired resulting from trauma, heavy weight lifting, chronic cough, constipation, benign prostrate hyperplasia or any other cause increasing intra-abdominal pressure.³ External hernia can be epigastric, para umbilical, umbilical, inguinal, femoral, lumbar and spigellian hernia.⁴ Inguinal hernia is the most common hernia occurring in males.⁵ It can occur in any age group as it can be congenital or acquired. It can also be classified as direct or indirect inguinal hernia. In indirect inguinal hernia contents comes through deep inguinal ring to superficial inguinal ring while in direct inguinal hernia contents come directly through posterior wall of inguinal canal. Indirect inguinal hernia is common in young adults while direct inguinal hernia is more common among old adults.⁶ Direct and indirect inguinal

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hernia can be further classified into complete and incomplete inguinal hernia. An incomplete hernia is confined to the inguinal canal whereas a complete hernia comes out of the inguinal canal through the external or superficial ring into the scrotum.

Inguinal hernia are also classified as reducible inguinal hernia, irreducible inguinal hernia, obstructed inguinal hernia and strangulated inguinal hernia. In reducible hernia contents are reduced spontaneously on lying or by patient and physician. Intestine are difficult to reduce and they produce gurgling sounds. Omentum is doughy, and it is difficult to reduce the last portion. In irreducible inguinal hernia contents cannot be reduced. In obstructed hernia bowel get obstructed but its blood supply is patent. In strangulated hernia blood supply does not remain patent and results in ischemia of contents.⁷

The surgical procedure for hernia can be open or laparoscopic. In open surgery it usually depends upon the age of the patient.⁸ In congenital inguinal hernia herniotomy is the procedure of choice in which sac is opened and contents are reduced followed by plication of hernia sac.⁹ No muscle strengthening is required. In teenagers and patients with obstructed hernia hernioraphy can be performed after herniotomy.¹⁰ In hernioraphy post wall of inguinal canal is plicated or strengthened using non absorbable sutures. In adults and old age group hernioplasty is done using non absorbable mesh after herniotomy and hernioraphy.¹¹ Laparoscopic procedures includes trans abdominal pre peritoneal mesh (TAPP) hernioplasty and total extra peritoneal mesh (TEP) hernioplasty.¹²

The complications of hernia repair include post operative pain, mesh infection, organ or tissue damage, recurrence of hernia, seroma formation, nerve damage, hematoma and fistula formation.¹³ All surgical procedures are associated with certain level of postoperative pain. Fear of postoperative pain is one of the greatest concerns of patients undergoing surgery. There are different methods used for the control of postoperative pain. It can be achieved by administration of pain killer. There are two types of analgesic drug groups which are used to control the postoperative pain. These can be opioid or non-opioid analgesic groups.¹⁴

Other method of controlling Post-operative pain is administration of local anesthetics at wound site pre or post operatively. Postoperative pain management with locoregional anesthesia technique is much effective solution.¹⁵ These methods are associated with lower the pain score after surgical procedure. Local anesthetics can be divided into two basic amino-amide and amino-

ester groups. The amino-ester group include procaine, chlorprocaine, tetracaine and cocaine. While amino-amide group contain lidocaine, bupivacaine, ropivacaine, mepivacaine, prilocaine.¹⁶ Among these local anesthetics bupivacaine and lignocaine are most commonly used for wound infiltration after surgical procedure.¹⁷ They are mostly used in inguinal hernia wound infiltration to reduce postoperative pain to lower the pain score. Local anesthetics administers into the incision area reduces opioids requirements.¹⁸ Local anesthetics used for wound infiltration after inguinal hernia proves very comfortable for patients. However the dose of local anesthetics should be monitored carefully as they have side effects on cardiovascular activity and cerebral toxicity.¹⁹ Tramadol is an opioid analgesic which is now used as local anesthetic instead of bupivacaine or lignocaine in mesh hernioplasty in international studies.²⁰

The rationale of this study is to compare the effect of bupivacaine and tramadol in management of postoperative pain in mesh hernioplasty in our setup. As no such data is present in our population and only limited data is present in international literature. This study will help us in effective postoperative pain management in hernioplasty patient. This postoperative pain management will result in early mobilization of patient and short hospital stay.

Materials and Methods

It was a comparative study, conducted in General Surgery Department Gulab Devi Hospital Lahore from July 2021 to December 2021. The study was conducted after approval from institutional review board and consent of the patients. A total of 50 patient diagnosed as case of inguinal hernia undergoing Lichtenstein mesh hernioplasty were recruited and divided into two equal groups (25 patients each). The sample size was calculated taking postoperative analgesia 6.9 ± 0.9 hours in tramadol versus 3.7 ± 0.7 hours from present international data. The exclusion criteria was patient of age less than 20 years having herniotomy or hernioraphy only, recurrent inguinal hernia, had any analgesia preoperatively, any neuropathy and patients having general anesthesia per operatively. In Group A injection tramadol 2mg/kg was injected in deep and superficial tissues of wound postoperatively while in Group B bupivacaine 0.25% (0.2ml/Kg) was injected. No analgesic was injected immediately post operatively. Visual analogue score (VAS) for pain intensity was calculated at 2,3,4,5 and 6 hours postoperatively. Analgesia injection paracetamol

was given only when patient demanded or VAS score was of 6. Data was collected on prescribed questionnaire and analyzed on SPSS 23. For qualitative data frequency tables and graph were used which in quantitative data means were taken and compared.

Result

Fifty patients with diagnosis of inguinal hernia and having mesh hernioplasty were included in this study. These patients were divided in two groups. In Group A Tramadol injection was injected while in Group B bupivacaine was injected. Mean age of patients in Group A and Group B were 38 ± 10.5 years and 36 ± 9.1 years respectively. Mean weight of patients in Group A and Group B were 73.7 ± 10.4 Kg and 76.6 ± 10.7 Kg respectively. All patients were male. Out of these 50 patients 22 (44%) were having right inguinal hernia while 28 (56%) had left sided inguinal hernia. All the patients included in this study had reducible inguinal hernia. In 40 (80%) patients hernia was complete while only in 10 (20%) had incomplete inguinal hernia. In 39 (78%) patients had indirect inguinal hernia while 11 (22%) patients had direct inguinal hernia.

Means of Visual analogue score of pain intensity at 2, 3, 4, 5 & 6 hours in Group A and Group B were 1.60 ± 0.76 vs 1.64 ± 0.70 , 2.12 ± 0.66 vs 2.4 ± 0.7 , 3.08 ± 0.64 vs 4.24 ± 0.66 , 4.8 ± 0.7 vs 5.72 ± 0.54 , 5.90 ± 0.25 vs 5.85 ± 0.50 . Mean duration of time period between operation and first dose of analgesic in Group A and Group B was 4.60 ± 0.5 hours and 4.16 ± 0.37 hours respectively (p-value 0.001). The effect of locally administered tramadol was more as compared to bupivacaine. In Group A 10 (40%) had analgesic injection at 5 hours and 15 (60%) had analgesic injection at 6 hours postoperatively. In Group B 21 (84%) had analgesic injection at 5 hours while only 04 (16%) had injection at 6 hours postoperatively. No significant complication was documented in each group. All patients had spinal anesthesia during their operation.

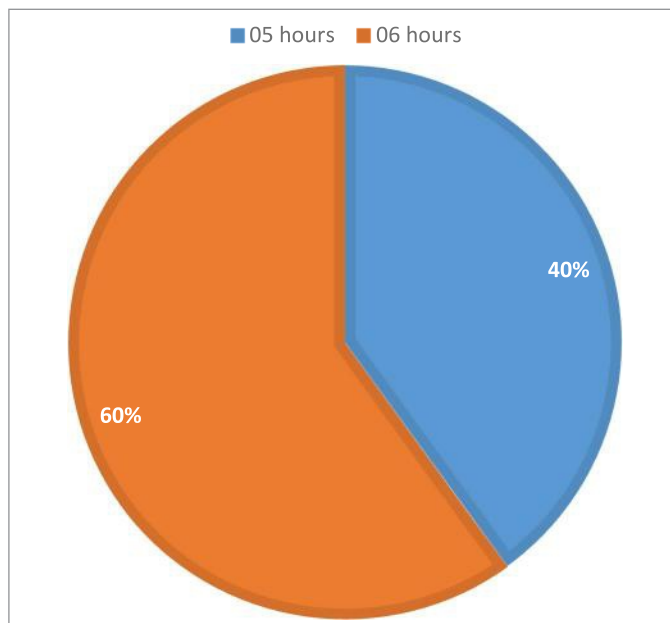


Fig-1: Duration between Operation and 1st Analgesic In Group A (Tramadol)

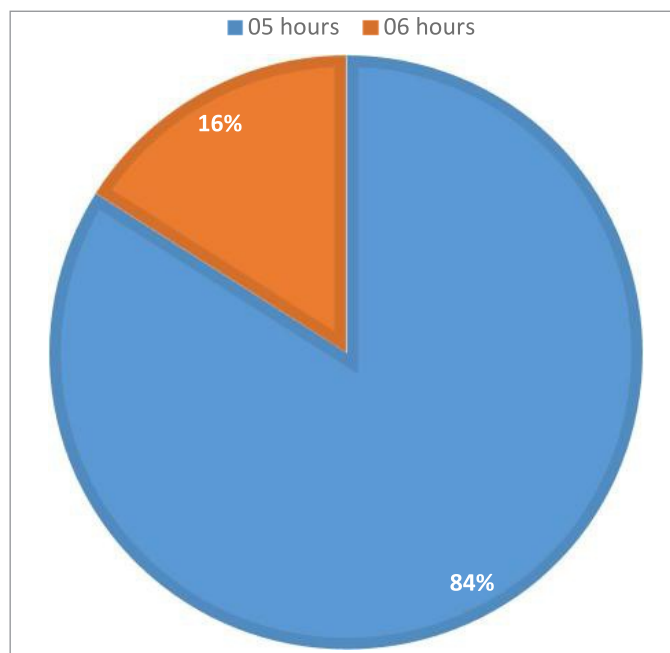


Fig-2: Duration Between Operation And 1st Analgesic In Group B (Bupivacaine)

Table 1: Differences between variables among Tramadol and Bupivacaine group

Variables	Local Administered		p-value
	Tramadol	Bupivacaine	
Duration	4.60 ± 0.5 hrs	4.16 ± 0.37 hrs	0.001
Visual Analogue Score for pain intensity			
02 hrs	1.60 ± 0.76	1.64 ± 0.70	0.848
03 hrs	2.12 ± 0.66	2.4 ± 0.7	0.156
04 hrs	3.08 ± 0.64	4.24 ± 0.66	0.001
05 hrs	4.8 ± 0.7	5.72 ± 0.54	0.001
06 hrs	5.90 ± 0.25	5.85 ± 0.50	0.315
Mean VAS	3.26 ± 0.60	3.59 ± 0.38	0.025

Discussion

In our study diagnosed cases inguinal hernia undergoing Lichtenstein mesh hernioplasty were divided in two groups. In Group A tramadol was injected in wound area on completion of operation while in Group B bupivacaine was injected in wound postoperatively. According to our study effect of tramadol was prolonged as com-

pared to bupivacaine. In Group A patient 10 (40%) had analgesic injection at 5 hours postoperatively as compared to 21 (84%) in Group B. Mean duration of time period between operation and first dose of analgesic in Group A (tramadol) and Group B (Bupivacain) was 4.60 ± 0.5 hours and 4.16 ± 0.37 hours respectively (p-value 0.001) while in an international study VAS was significantly higher among patient in group B (Bupivacain) than group T (tramadol) ($P < .05$). Time for first analgesic requirement was earlier in group B patients than group T patients (3.7 ± 0.745 vs 6.6 ± 0.992 hours, respectively ($P < .05$)).⁽²⁰⁾ These findings are consistent with our study. In the study of Wahdan et al. Visual analogue score is statistically lower after six hours postoperatively in tramadol group compared to the bupivacaine groups.²² Similarly in our study we found that individual mean visual analogue score for pain intensity at 2,3,4,5 and 6 hours postoperatively was better in those patients in which tramadol was injected in wound postoperatively compared to bupivacaine (p-value 0.001). Similarly mean VAS was also less in in Group A which was 3.26 ± 0.60 as compared to 3.59 ± 0.38 group B (p-value 0.025). This is according to national and international studies. No significant immediate postoperative complications like wound infection and wound infection were documented in both groups.

Conclusion

Tramadol when infiltrated in wound post operatively had longer duration of action as compared to bupivacaine 4.60 ± 0.5 hours and 4.16 ± 0.37 hours respectively (p-value 0.001).

Conflict of Interest

None

Funding Sources

None

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Authors Contribution

UAR, MAI: Conceptualization of Project

MJB, MZM: Data Collection

KA, IA: Literature Search

UAR, MAI: Statistical Analysis

UAR, MAI: Drafting, Revision

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