

# Efficacy of Intra-peritoneal Bupivacaine for Analgesia in Early Post-operative Period After Laparoscopic Cholecystectomy

NISAR AHMED, RIAZ HUSSAIN, TAHIR NAZEER

## ABSTRACT

**Aim:** To compare the efficacy of intra-peritoneal bupivacaine (25%) in early post-operative period after laparoscopic cholecystectomy with a control group.

**Study Design:** Randomized Control trial.

**Method:** 120 patients undergoing for laparoscopic cholecystectomy were included and divided into two equal groups B and C by using random number table. Each group comprised of 60 patients. In group 'C' no intra-peritoneal bupivacaine was used. In group 'B' 20 ml of (.25%) bupivacaine was instilled in the right sub-diaphragmatic space and at gall bladder bed.

**Results:** Post-operative mean abdominal pain score on VAS in both groups on different intervals was calculated and recorded 1.34±0.43 (cm) in group B and 2.54±0.26 (cm) in group C at 0 hours, 2.11±0.32 (cm) in group B and 2.98±1.05 (cm) in group C at 2 hours, 2.98±1.05 (cm) in group B and 3.24±0.84 (cm) in group C at 4 hours while 3.13±1.21 (cm) in group B and 4.59±1.32 (cm) in group C at 6 hour were recorded. Comparison of Efficacy in both groups was recorded which reveals 22(36.67%) in group B and 4(6.67%) in group C while 38(63.33%) group B and 56(93.33%) in group C.

**Conclusion:** Intra-peritoneal bupivacaine infiltration is an effective method for relief of post operative pain in laparoscopic cholecystectomy.

**Keywords:** Laparoscopic cholecystectomy, post-operative pain, intra-peritoneal bupivacaine

---

## INTRODUCTION

Laparoscopic cholecystectomy is one of the most frequently performed elective surgical operations<sup>1</sup>. The benefits of laparoscopic cholecystectomy compared with open surgery are less post-operative pain, reduced analgesic consumption and more rapid return to normal daily activities; However post-operative pain still remain the most prevalent complaint after this type of surgery and is more common in early post-operative period<sup>2-6</sup>.

Several analgesic interventions with varying targets and mechanisms have been used to control early post-operative pain after laparoscopic cholecystectomy<sup>7</sup>. Intra-peritoneal bupivacaine has been the most widely used local anaesthetic because of its long duration of analgesic action and high potency<sup>8,9</sup>. Pain relief after laparoscopic cholecystectomy is an issue of great practical importance<sup>10</sup>. Laparoscopy has become the new gold standard for the treatment of symptomatic cholelithiasis and an increasing number of procedures are done for acute cholecystitis<sup>11,12</sup>.

## MATERIAL & METHODS

After the approval of study from the hospital ethics committee 120 patients undergoing laparoscopic

cholecystectomy were included and divided into two equal groups B & C by using a random number table. Patient's bio-data was noted. Informed consent was taken, pre-operative assessment was done a day before surgery. Enrolled patients were explained about the use of Visual Analogue Scale, employed in this study. In operation theater standard II monitoring was used. In all cases nalbuphine 6mg, and metochlopramide 10 mg was administered IV before induction of anaesthesia which was achieved by propofol and suxamethonium for intubation with endotracheal tube, maintained by using oxygen nitrous oxide and Isoflurane, muscle relaxation by Atracurium. All four incision sites were infiltrated with 5 ml of .5% bupivacaine 2 minutes before incision. Pneumo-peritonium was produced by CO<sub>2</sub> insufflation and pressure was maintained between 12-14mmHg. Gall bladder was delivered out through epigastric port. In group C no intraperitoneal bupivacaine was used while in group B 20 ml of bupivacaine (.25%) was instilled in the right sub-diaphragmatic space and at gall bladder bed. At the end, muscle relaxation was reversed by neostigmine and glycopyrolate. The dosage of all the anaesthetic drugs used according to the standard protocols and were the same for all patients. The time of arrival in the post-operative ward was defined as zero hour. The patients were assessed at 0, 2, 4 and 6 hours post-operatively by Visual Analogue scale (VAS) for

---

Department of Anaesthesia, Services Hospital, Lahore

Correspondence: Dr. Tahir Nazeer, Email: drtahirnazeer@yahoo.com

pain. The rescue analgesic dose consist of nalbuphine 2 mg and was given when VAS is more than 6 cm or on patient request. Both male and female patients between 20 to 60 years of age, with ASA class P<sub>1</sub> and P<sub>2</sub>. and patients undergoing laproscopic cholecystectomy under general Anaesthesia were included in the study. Patients with previous abdominal surgery, if an intraperitoneal drain is placed at the end of surgery and patient who can't understand Visual Analogue Scale were excluded from the study.

**RESULTS**

In this study calculated sample size was 120 cases ie 60 patients in each group and sampling technique was non-probability purposive sampling, result was calculated with 80% power of test, 5% level of significance and taking expected percentage of efficacy (i.e., pain score = 0 cm VAS) in both groups ie 8.6% in control group and 29.4% in bupivacaine group in early post-operative period after laproscopic cholecystectomy. In group B 70% female and 30% male were calculated. In group C 65% female and 35% male patient were calculated. Post operative mean abdominal pain score on VAS in both groups on different intervals was calculated and recorded 1.34±0.43 (cm) in group B and 2.54±0.26 (cm) in group C at 0 hours, 2.11±0.32 (cm) in group B and 2.98±0.54 (cm) in group C at 2 hours, 2.98±1.05 (cm) in group B and 3.24±0.84(cm) in group C at 4 hours while 3.13±1.21(cm) in group B and 4.59±1.32 (cm) in group C at 6 hours were recorded. Comparison of efficacy in both groups were recorded which reveals 36.67% in group B and 6.67% in group C while 63.33% in group B and 93.33% in group C.

Table 1: Age Distribution of Patients (n = 120)

Age (in years)	Group B	Group C
20-30	8(13.33%)	10(16.67%)
31-40	19(31.67%)	17(28.33%)
41-50	22(36.67%)	24(40%)
51-60	11(18.33%)	9(15%)
Mean+sd	38.54±4.35	40.21±5.65

Table 2: Gender distribution of patients (n = 120)

Gender	Group B	Group C
Male	18(30%)	39(65%)
Female	42(70%)	21(35%)

Table 3: Post operative mean abdominal pain score in both groups on different intervals (n=120)

Postop time	Group-B	Group-C
0 hrs	1.34±0.43 (cm)	2.54±0.26(cm)
2 hrs	2.11±0.32(cm)	2.98±0.54(cm)
4 hrs	2.98±1.05(cm)	3.24±0.84(cm)
6 hrs	3.13±1.21(cm)	4.59±1.32(cm)

Table 4: Comparison of efficacy in both groups (n = 120)

Efficacy	Group B	Group C
Yes	22(36.67%)	4(6.67%)
No	38(63.33%)	56(93.33%)

P value = 0.00 i.e. ≤ 0.05

**DISCUSSION**

Though laproscopic cholecystectomy is currently considered to be a relatively minor operation, but an important factor that limits recovery is post-operative pain<sup>13,14</sup>.

An understanding of the physiological basis of pain is helpful to the sufferer and the professionals who have to provided appropriate treatment<sup>15,16</sup>.

According to a review by Dahl et al, only 3 of 13 placebo-controlled studies showed a significant, clinically relevant advantage of wound infiltration<sup>17</sup>.

Maharjan SK and co-worker revealed the efficacy for abdominal pain in early post-operative period after laparoscopic cholecystetomy was 29.4% as compared to 8.6% in control group in which no intraperitoneal bupivacaine is used. Our findings are in agreement with this study<sup>6</sup>.

Our results are consistent with other studies in which intra-peritoneal administration of local anaesthetic has been shown to have a modest analgesic effects<sup>18,19</sup>. In one study of Kjaergaard M et al they found modest reduction in pain intensity which was observed mainly after the operation and not clinically relevant reduction in opioid consumption was observed<sup>20</sup>.

**CONCLUSION**

Intraperitoneal bupivacaine infiltration is an effective method for relief of post-operative pain of laproscopic cholecystectomy.

**REFERENCES**

- Masood R, Samiullah M, Ahmed I. Laproscopic cholecystectomy for left sided gall bladder: an unusual case. J Ayub Med Coll abbottabad 2009; 21 (1): 162-4.
- Morgan GE, Mikhail MS, Murray MJ. Clinical Anesthesiology 5<sup>th</sup> Ed. New York, Mc Grawhill Lange, 2013: 361.
- Victorzon M, Tolonen P, Vuorialho T, Day Case Laparoscopic cholecystectomy: Treatment of choice for selected patients? Surg Endosc 2007; 21: 70-3.
- Moussa A, Banehriz F. Bilateral thoracic paravertibral block versus intra-peritoneal bupivacaine for pain management after laproscopic cholecystectomy. Saudi J Anaesth 2007; 1(2) : 62-7.
- Gupta R, Bogra J, Kothari N. post-operative analgesia with intraperitoneal fentanyl and bupivacaine: a randomized control trial. Canadian J Med 2010; 1 (1) : 1-11.

6. Maharjan SK, Shrestha S. Intra-peritoneal and peritoneal injection of bupivacaine for pain after laproscopic cholecystectomy. *Kathmandu Univ Med Journal* 2009; 7 (1) Issue 25: 50-3.
7. Bisgaard T. Analgesic Treatment after Laproscopic cholecystectomy *Anesthesiology* 2006; 104 (4): 835.
8. Shaikh JM, Mughal A, Shaikh SM. Caudal epidural for post-operative analgesia in male children. *JLUMHS* 2006; 5 (3): 110-13.
9. Aitkenhead AR, Smith G, Rowbotham DJ. *Textbook of Anaesthesia* 5<sup>th</sup> ed. Edinburgh, Churchill Livingstone Elsevier 2007: 60-1.
10. Mitra S, Khandelwal P, Roberts K, Kumar S, Vadivelu N. Pain relief in laproscopic cholecystectomy, a review of the current options. *Pain Pract* 2012; 12 (6): 485-96.
11. Mosimann F. Laproscopic cholecystectomy has become the new gold standard for the management of symptomatic gallbladder stones. *Hepatogastroenterology* 2006; 53 (69) : 1.
12. Kitano S, Matsumoto T, Aramaki M,. Laproscopic cholecystectomy for acute cholecystitis. *J Hepatobiliary Pancreat Surg* 2002; 9 (5): 534-7.
13. Ng A, Parker J, Toogood L, Corron BR, Smirh G. Does the opioid-sparing effect of rectal dclufenac following total abdominal hysterectomy benefit the patient *Br J Anaesth* 2002; 88: 714-6.
14. Ng A, Smith G, Davidson AC. Analgesic effect of paracoxib following total abdominal hysterectomy. *Br J Anaesth* 2003; 90: 746-9.
15. Geraciotti TD, Carpenter LL, Owens MJ. Elevated cerebrospinal-fluid substance P concentration in post traumatic stress disorder and major depression. *Am J Psychiatry* 2006; 163: 637-43.
16. Shibasaki H, Central mechanisms of pain perception. *Suppl Clin Neurophysiol* 2004; 57: 39-49.
17. Dahl JB, Moniche S, Kehet H, wound infiltration with local anaesthetics for post-operative pain relief. *Acta Anaesthesiol stand* 1994; 38: 7-14.
18. Labaille T, Mazait IX, Pagueron X, Franco D, Benhamou D. The clinical efficacy and pharmacokinetics of intraperitoneal ropivacaine for laproscopic cholecystectomy. *Anesth Analg* 2002; 94: 100-5.
19. Torres L, Radriguez M, Montero A. Efficacy and safety of dipyron versus tramadol in the management of pain after hysterectomy: a randomized, double blind,maulticenter study. *Reg Anesth Pain Med* 2001; 26: 118-24.
20. Kjaergaard M, Moiniche S, Olsen KS. Wound infiltration with local anaesthetics for post-operative pain relief in lumber spine surgery: a systemic review. *Acta Anaesthesiol Scand* 2012; 56 (3): 282-90.