ORIGINAL ARTICLE

Pre-emptive Analgesia in Laparoscopic Cholecystectomy by Intraperitoneal Instillation of Bupivacain

SHAHZAD ALAM SHAH[1], MUHAMMAD ASLAM JAVED[2], HINA KHAN[3] MUHAMMAD ARSHAD[4], TAYYAB ABBAS[5]

[1]Assistant Professor Fatima Jinah Mediacl College, [2]Senior Registrar Sir Ganga Ram Hospital, [3]Senior Registrar Sir Ganga Ram Hospital, [4]Senior Registrar Sir Ganga Ram Hospital, [5]Professor of Surgery Fatima Jinnah Medical College, Lahore

Correspondence to: Shahzad Alam Shah, Department of Surgery Fatima Jinnah Medical College/Sir Ganga Ram Hospital Lahore: email: shahzadalamshah@gmail.com

ABSTRACT

This study is designed to assess the efficacy of pre-emptive analgesic effect of bupivacain instillation in peritoneal cavity after laparoscopic cholecystectomy.

Aims and Objective

To evaluate the outcome of pre-emptive analgesia in laparoscopic cholecystectomy by Intraperitoneal instillation of Bupivacain in terms of incision site pain, Generalized abdominal pain and shoulder pain.

Design and Duration: Prospective randomized study conducted from June, 2013 till May, 2015.

Methods: This study includes 110 patients that were qualified for laparoscopic cholecystectomy. These patients were divided into two groups A & B. Selection in each group was at random. In Group A patients 20ml of plain normal saline was instilled into the peritoneal cavity after the procedure whereas Group B patients received 0.25% of bupivacain diluted to 20ml of normal saline. Skin and subcutaneous tissue and pre-peritoneal space was instilled with bupivacain after the induction of anesthesia and before the start of procedure. The indicators of the study were pain intensity in postoperative period, nausea and vomiting (PONV), shoulder pain and the analgesia request rate. The study is condacted in surgical Unit, III Sir Ganga Ram Hospital, Lahore.

Results: The pain intensity and the post operative nausea and vomiting and shoulder pain were significantly less in the Group B compared to Group A patients.

Conclusion: In patient undergoing laparoscopic cholecystectomy the instillation of bupivacain after the completion of the procedure is effective in attaining an adequate analgesia effect in post operative period.

Key Words: preemptive, bupivacaine, intraperitoneal, laparoscopic cholecystectomy, postoperative analgesia

INTRODOUCTION

Laparoscopic surgery is associated with markedly less post operative pain compared to conventional open surgery[1]. However, laparoscopy is not totally pain free. In minimally access surgery most of the patients experience discomfort in the form of generalized abdominal pain, PONV and shoulder tip pain[2,3,4]. The cause of this post-operative pain in laparoscopic cholecystectomy is multifactorial[5]. These symptoms are frequently due to peritoneal stretching, inflammation of the peritoneum and shoulder pain caused by irritation of the diaphragm due to retained CO^2. Whereas, in open surgery the pain and associated symptoms are due to parietal somatic pain. In order to further reduce the incidence of pain, various studies have shown the positive role of intra-peritoneal instillation of the bupivacain or similar local anesthetics. In this context some surgeons favored instillation before creation of the pneumoperitoneum and others used it at the end of their procedure[6]. The purpose of this study is to evaluate the role postoperative intra-peritoneal instillation of 0.25 percent bupivacain in selective cases of gallstone disease in which laparoscopic cholecystectomy was planned.

METHODS

A total of 110 patients in which laparoscopic cholecystectomy was planned were included in this study. Eighty five (77.27%) females and twenty five (22.73%) males were selected with ASA grade 1 and 11. All procedures were performed under general anesthesia with endotracheal intubation. In this double blind study the patients were randomized into two groups having 55 patients in

each Group A and Group B. All the patients were instructed about the use of 10cm VAS. Patients in Group A were instilled 20 ml of normal saline and patients in Group B were instilled 20 ml of 0.25% bupivacain dissolved in normal saline intra peritonealy after the completion of the procedure. These solutions were instilled over the liver in the sub diaphragmatic space in each case. The observer was blinded to the instilled solution. The main indicators of the study were post operative pain intensity, postoperative nausea and vomiting (PONV), shoulder tip pain in the postoperative period and analgesia request rate in the post operative period. Patients with acute Cholecystitis were excluded from the study. Routine protocol for the general anesthesia was followed including the medications used for each patient. Patients were analyzed in the postoperative period for the pain, shoulder pain, nausea and vomiting, and the number time the analgesia used. The indicators were assessed in zero, 2, 4, 8, 12 and 24 hours. VAS was consisting of 10cm scale, showing 0 to 10cm marks. Zero depicted no pain and 10 cm mark indicated worst imaginable pain. Also at the above mentioned times the heart rate and blood pressure were assessed at the above mentioned times.

RESULTS

The groups A and B were analyzed and compared for the age and sex. These demographic incidences are shown in Table1. Mean post-operative pain score on Visual Analogue Scale (VAS) at various time intervals were assessed in the two groups of patients. The VAS was significantly higher for the Group A patients (4.5 mean +_ SD) compared to Group B patients 2.3 (mean +_ SD). Time periods of 0, 2, 4, 8, 12, and 24 post operative hours for assessment were used (Table 2). Incidence of post operative nausea and vomiting was found to have significantly reduced in Group B patients and the comparison at different times is depicted in Table 3. Regarding the pattern of pain the commonest complaint was generalized abdominal pain in both groups in the initial hours i.e., 0, 2, and 4 hours where as the incidence of shoulder pain was present at 24 hours in only Group A patients (Table 4). The total number of patients requiring rescue analgesia was higher in Group A and also the amount of analgesia consumed was also higher in the same group of patients (Table 5).

Table 1: Incidence of Age And Sex Ratio in Both Groups A & B. Age Values Are Mean ± SD

	Group A	Group B
SEX Ratio (F:M)	40:15	45:10
AGE (Years)	41 +_ 7.4	39 +_ 6.1

Table 2: Visual Analog Scale Pain Score

Post operative Hours	Group A (n)	Group B (n)
0 Hrs	4.5 ± 0.83	3.7 + 1.0
2 Hrs	5.1 ± 1.0	3.3+ 1.1
4 Hrs	4.1+ 1.13	2.4+ 0.9
8Hrs	3.3+ 1.0	1.9+ 0.5
12 Hrs	0.9+ .09	0.7+0.9
24 Hrs	0.9+ 06	0.8+ 0.7

Table:3 Nausea and Vomiting in Patient Studieds n=No of Patients

	Group A (n)	Group B(n)
Post operative Nausea	28	4
Post operative Vomiting	10	3

Table 4: Pattern of Pain in Both Group Patients

	Group A (n) (%)	Group B (n) (%)
Incision Site Pain	05 (2.65%)	03 (1.7%)
Generalized Abdominal Pain	09 (4.77%)	23 (13.7%)
Shoulder Pain	02 (1.06%)	08 (4.56%)

Table 5: Male To Female Ratio In Each Group And Analgesia Request Rate Group: A(n) 40/F:15/M GROUP: B(n) 45/F:10/M

Hours	4 Hours		8 Hours		12 Hours		24 Hours	
	Female	Male	Female	Male	Female	Male	Female	Male
Group A (n)	25	09	22	05	10	02	03	NIL
Group B (n)	19	03	17	02	08	NIL	03	NIL

DISCUSSION

This study depicts that intra-peritoneal instillation of bupivacain (Group B) lowers the pain score VAS particularly in the initial eight hours of post operative period, whereas, at 12 and 24 hours VAS shows no significant difference in pain experienced by patients in the both two groups of patients.

In retrospective analysis of the literature it is now more than two decades that clinical trials are being conducted to determine the role of local anesthetic instillation into the peritoneum after laparoscopic cholecystectomy.[7,8,9] In majority of the studies the results were favorable and the beneficial effects of local anesthetic instillation has been recomended. Rakesh et al [3] compared the use of Intraperitoneal instillation of ropivacaine and bupivacaine and found both these drugs effective for the post operative pain relief in laparoscopic cholecystectomy and Barezynski M [6] found in its study that pre emptive analgesia with bupivacaine intraperitoneal instillation is much more effective for pain relief if used before creation of pneumoperitoneum.

It was also found that the incidence of postoperative nausea and vomiting was significantly less in Group B patients. This resulted with an added advantage of less post operative hospital stay and hence less use of postoperative medication. Snjezana G[10] and his colleagues also experienced similar results of PONV in their study where these were the major indicators.

Incidence of post operative shoulder tip pain is a common finding and complaint of patients after laparoscopic procedure. This is mainly because of retained CO2 in the peritoneal cavity which result in diagphragmatic irritation and hence referred to the shoulder via phrenic innervations. Our study indicates the decreased incidence of this complaint as only 2 patients suffered such pain that had post operative instillation of the bupivacain. Narchi P and his colleagues were one of the few who specifically studied the role of local anesthesia instillation on shoulder tip pain.[5] Joris et at in their study observed pain characteristics after laparoscopic cholecystectomy and they studied the effect of instillation of 80 ml of 0.125% bupivacaine with adrenaline. They observed that visceral pain discomfort was experienced by the patients in early postoperative period and later the shoulder tip pain becomes the main complaint on the second day.[4] However, the intensity of shoulder pain in their study was comparatively less than the study of Narchi et al[5]. This was perhaps because of careful emptying of carbon dioxide pneumoperitoneum as was explained Narchi et al. Apart from the effective role of preemptive instillation of local anesthesia specifically in laparoscopic cholecystectomy[10,11,12] various authors have also demonstrated its effectiveness in pelvic surgeries as well.[9,13] Few studies have shown results that were not defining the definite role of local anesthetic drug instillation. And a few of the randomized, controlled trial found that pre-emptive instillation of bupivacaine at the conclusion of laparoscopic hysterectomy does not result in reduced postoperative pain.[9] Rajnikant SM[14] also found conflicting results in their study . Most of these initial studies have used small doses of bupivacaine or lidocaine. However, Manoj AV et al[15] and Khaled MM et al[16], in their studies demonstrated that there was a significant reduction in visual pain score and shoulder tip pain. Both of these studies has shown that there is significant decrease in the rescue analgesic requirement in patients getting instillation of local anaesthetic after laparoscopic cholecystectomy.

CONCLUSION

This study has shown that intra peritoneal instillation of the bupivacain immediately postoperatively is simple to use and is effective in reducing the pain, nausea and vomiting in early postoperative period. This also reduces the rescue analgesia requirement. Therefore is recommended in patients undergoing laparoscopic cholecystectomy.

REFERENCES

1. Barezynski M: Postoperative sSymptoms, after care and return to Routine activity after

Laparoscopic Cholecystectomy: JSLS,2010;Oct-Dec;14(4):484-489
2. Marco Alan P, Yeo Charles J & Rockpeter: Anesthesia for a patient undergoing Laparoscopic Cholecystectomy. Anesthesiology, 1990; 1268-1270
3. Rakesh Babu, Prithi Jain, Lulu Sherif: Intraperitoneal Instillation: Ropivacain Vs Bupivacain For Post operative Pain ReliefIn Laparoscopic Cholecystectomy: IJHSR, 2013;3(12):42-47
4. Joris J, Cigarini I, Legrand M, Jacquet N, DeGD, Franchiment P, lamy M: Metabolic and Respiratory changes after Laparoscopic Cholecystectomy performed via Laparotomy or Laparoscopy: Brit J Anesth; 1992; 69:341-345
5. Narchi P, Benhamou D, Fernendez H,: Intraperitoneal Local Anesthetics for shoulder pain after day case laparoscopy. The Lancet, 1991;338:1569-1570
6. Barczynski M, Kontorek A, Herman RM: Superiority of pre-emptive analgesia with intraperitoneal instillation of Bupivacain before rather than after creation of pneumoperitoneum for Laparoscopic Cholecystectomy: A Randomized Double blind placebo controlled study.Surg. Endosc, 2006 July, 20(7):1088-93
7. ChundrigarhT, Morris R, Hedges AR: Intraperitoneal bupivacain for effective pain relief after Laparoscopic Cholecystectomy. Annals R Coll Surg Engl: 1993;75:437-439
8. Pasqualucci A, Angelis VA, Contrado et al: Pre-emptive Analgesia Intraperitoneal local anesthesia in Laparoscopic Cholecystectomy: A randomized , double blind , placebo controlled study. Anesthesiology: 1996;85:11-20
9. Arden D, Selfert E, Donnelan N et al: Intraperitoneal Instillation of bupivacain for the reduction of postoperative pain after laparoscopic hysterectomy: A double blind randomized controlled trial. J Minim Invasive Gynecol:2013 Sep-Oct,20(5):620-6
10. Snjezana G, Vesna G, Valtka S: Intraperitoneal Analgesia for Laproscopic Cholecystectomy: Periodicum Biologorum:2009: Vol 111,No2., 236-266
11. Ahmaed BH, Ahmed A, Tan D et al: Post Laparoscopic Cholecystectomy pain:effects of intraperitoneal local anesthetics on pain control: A randomized prospective double blind placebo control trial. Am Surg 2008, 74: 201-209
12. Gupta A: Local Anesthetics for pain releief after Laparoscopic Cholecystectomy: A systematic review. Best Pract Rec Clin Anaesthesiol: 2005; 19: 275-292
13. Continous Infusion of Local anesthetics following laparoscopic hysterectomy-a randomized controlled trial. BJOG 2014 May; 121(6);754-60
14. Rajnikant SM, Naveen KCP, Akkamahadevi P. Comparative study of intraperitoneal instillation of 0.5% bupivacain with adrenaline and placebo for postoperative analgesia in laparoscopic cholecystectomy. IJSR 2014;(3) ISSN no.2277-8179
15. Manoj AV, Hiten MP, Samir MK et al. Superiority of pre-emptive analgesia with instillation of 0.5% bupivacain for laparoscopic cholecystectomy. Int J Res Med:2013;2(4):59-63
16. Khaled MM, Esam EMA. Post-operative pain relief after laparoscopic cholecystectomy Intraperitoneal lidocain versus Nalbuphin. Ain Shams Journal of Anaesthesiology.2014;07:40-44.