

## Original Research

### **Pre-emptive versus post-surgery IPLA in controlling postoperative pain after elective laparoscopic cholecystectomy in adult patients- A Comparative study**

Ashish Goyal<sup>1</sup>, Vivek<sup>2</sup>

<sup>1</sup>Assistant Professor, Dept of General Surgery, Sakshi Medical College, Guna, Madhya Pradesh, India;

<sup>2</sup>Assistant Professor, Dept of Anaesthesia, Sakshi Medical College, Guna, Madhya Pradesh, India;

#### **ABSTRACT:**

**Background:** Laparoscopic removal is now the procedure of choice when cholecystectomy is indicated. The present study was conducted to compare pre-emptive versus post-surgery IPLA in controlling postoperative pain after elective laparoscopic cholecystectomy in adult patients.

**Materials & Methods:** The present study was conducted on 126 patients with American Society of Anesthesiologists physical status I to III scheduled for laparoscopic cholecystectomy. The primary outcome was the intensity of postoperative pain by visual analogue scale score (VAS) at 30 minute, 1, 2, 4, 6, 24 hours after surgery. The secondary outcomes were analgesic request rate in 24 hours; duration of hospital stay and time to return to normal activity.

**Results:** Group I (Control) patients received 30 ml normal saline at beginning of surgery and at the end of the surgery. Group II patients (preemptive) received 30 ml 0.5% bupivacaine at the beginning of surgery and 30 ml of saline at the end of the surgery and group III patients (post-surgery) received 30 ml of saline at the beginning of surgery and 30 ml of 0.5% bupivacaine at the end of the surgery. VAS after 6 hours in group I was 3.2, in group II was 2.6 and in group III was 2.8. VAS after 24 hours in group I was 4.5, in group II was 3.5 and in group III was 3.9. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Authors found that Pre-emptive intraperitoneal local anaesthetic instillation resulted in less pain intensity and shoulder pain in patients underwent LC.

**Key words:** Local anaesthetic, Intraperitoneal, laparoscopic cholecystectomy

Received: 25 October 2017

Revised: 26 November 2017

Accepted: 7 December 2017

**Corresponding author:** Dr. Vivek, Assistant Professor, Dept of Anaesthesia, Sakshi Medical College, Guna, Madhya Pradesh, India

**This article may be cited as:** Goyal A, Vivek. Pre-emptive versus post-surgery IPLA in controlling postoperative pain after elective laparoscopic cholecystectomy in adult patients- A Comparative study. J Adv Med Dent Scie Res 2018;6(1):146-149.

#### **INTRODUCTION**

Cholecystectomy is the most common intraabdominal surgical procedure performed nowadays. Laparoscopic removal is now the procedure of choice when cholecystectomy is indicated. However, newer, less invasive techniques, such as natural orifice transluminal endoscopic surgery (NOTES) and single incision laparoscopic cholecystectomy (SILC), are currently being investigated as alternatives to the traditional 4-

port laparoscopic removal. Safety data and definitive benefits of these less invasive procedures are lacking.<sup>1</sup>

LC rapidly replaced open cholecystectomy (OC) 20 years ago as the procedure of choice when cholecystectomy is indicated. Few randomized trials were performed comparing LC to OC given the significant difference between the 2 procedures with regard to pain, hospital length of stay, and postoperative recovery. Some investigators felt it would be unethical

to subject patients to OC in a randomized trial given the benefits seen with LC.<sup>2</sup>

The origin of pain after laparoscopic cholecystectomy is multifactorial -pain arising from incision sites i.e., somatic pain, pain from gall bladder bed i.e., visceral pain and referred pain to shoulder. The most explainable cause for visceral and shoulder pain is peritoneal distension and visceral irritation caused by the creation of capnoperitoneum and surgical handling.<sup>3</sup> Intraperitoneal administration of local anaesthetic agents alone or in combination with opioids has been found to reduce the postoperative pain and analgesic consumption effectively following laparoscopic cholecystectomy. Recent advances suggest that an afferent block achieved before nociceptive input can reduce or eliminate the onset of central neural hyper excitability and can thus significantly reduce both intensity and duration of pain, while also delaying its onset.<sup>4</sup> The present study was conducted to compare pre-emptive versus post-surgery IPLA in controlling postoperative pain after elective laparoscopic cholecystectomy in adult patients.

**MATERIALS & METHODS**

The present study was conducted in the department of General Surgery and Anesthesiology. It comprised of 126 patients with American Society of Anesthesiologists physical status I to III scheduled for laparoscopic cholecystectomy of both genders. Patient information such as name, age, gender etc. was recorded. Patients were divided into 3 group. Group I (Control) patients received 30 ml normal saline at beginning of surgery and at the end of the surgery. Group II patients (preemptive) received 30 ml 0.5% bupivacaine at the beginning of surgery and 30 ml of saline at the end of the surgery and group III patients (post-surgery) received 30 ml of saline at the beginning of surgery and 30 ml of 0.5% bupivacaine at the end of the surgery. The primary outcome was the intensity of postoperative pain by visual analogue scale score (VAS) at 30 minute, 1, 2, 4, 6, 24 hours after surgery. The secondary outcomes were analgesic request rate in 24 hours; duration of hospital stay and time to return to normal activity. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

**RESULTS**

**Table I Distribution of patients**

Groups	Group I (Control)	Group II (Pre-emptive)	Group III (Post surgical)
Agent	30 ml saline	30 ml 0.5% bupivacaine, 30 ml of saline	30 ml of saline, 30 ml of 0.5% bupivacaine
Number	32	32	32

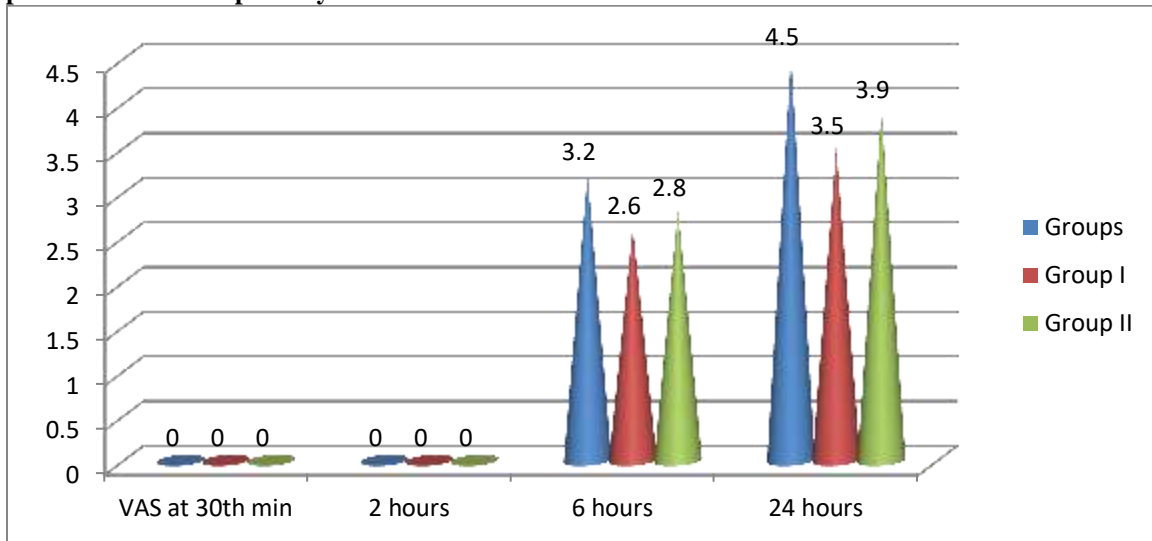
Table I shows that group I (control) patients received 30 ml normal saline at beginning of surgery and at the end of the surgery, group II patients (preemptive) received 30 ml 0.5% bupivacaine at the beginning of surgery and 30 ml of saline at the end of the surgery and group III patients (post-surgery) received 30 ml of saline at the beginning of surgery and 30 ml of 0.5% bupivacaine at the end of the surgery. Each group had 32 patients.

**Table II Assessment of primary outcome**

Parameters	Groups	Group I	Group II	Group III
VAS at 30 <sup>th</sup> min	0	0	0	0
2 hours	0	0	0	0
6 hours	3.2	2.6	2.8	0.04
24 hours	4.5	3.5	3.9	0.01

Table II, graph II shows that VAS after 6 hours in group I was 3.2, in group II was 2.6 and in group III was 2.8. VAS after 24 hours in group I was 4.5, in group II was 3.5 and in group III was 3.9. The difference was significant (P< 0.05).

**Graph II Assessment of primary outcome**

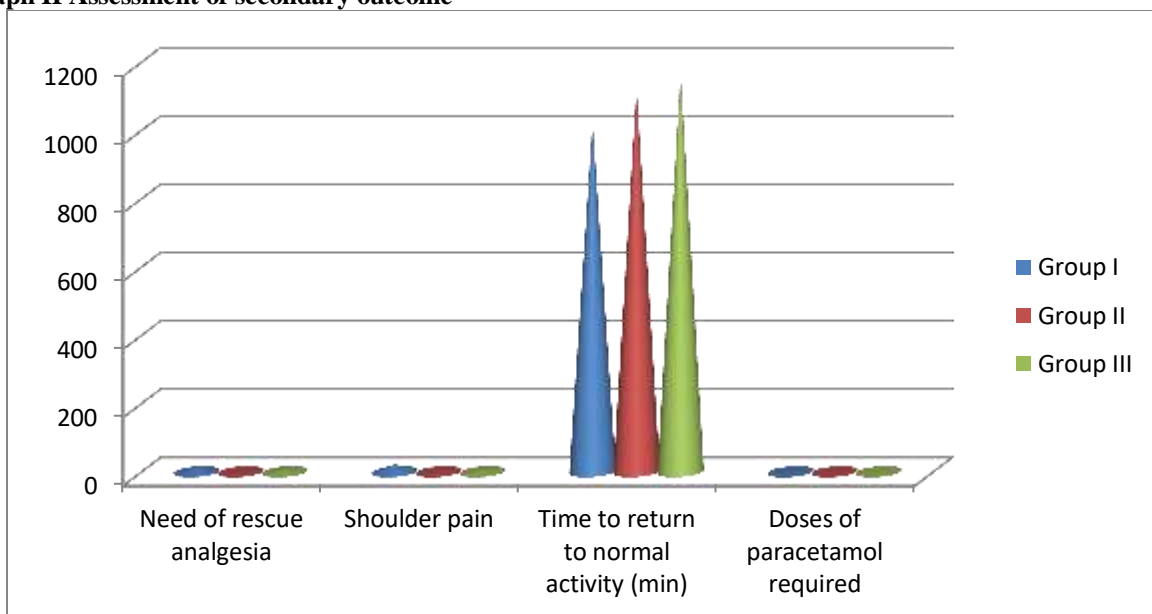


**Table III Assessment of secondary outcome**

Parameters	Group I	Group II	Group III	P value
Need of rescue analgesia	15	3	8	0.01
Shoulder pain	21	4	7	0.05
Time to return to normal activity (min)	1024	1126	1168	0.81
Doses of paracetamol required	3.1	2.4	2.7	0.02

Table III, graph II shows that need of rescue anesthesia in group I was seen in 15, 3 in group I and 8 in group III. Shoulder pain was observed in 21 in group I, 4 in group I and 7 in group III. Time to return to normal activity was 1024 minutes in group I, 1126 in group II and 1168 in group III. 3.1 doses of paracetamol was required in group I, 2.4 in group II and 2.7 in group III. The difference was significant ( $P < 0.05$ ).

**Graph II Assessment of secondary outcome**



## DISCUSSION

Currently, novel new techniques for gallbladder removal, such as natural orifice transluminal endoscopic surgery (NOTES) and single incision laparoscopic cholecystectomy (SILC), are being investigated as an alternative to the traditional 4-port LC.<sup>5</sup> While neither technique has been widely adopted, there is growing enthusiasm for SILC despite lack of data showing a distinct advantage over the traditional laparoscopic approach. Also unknown is how this increase in SILC will affect the currently low complication rate of LC, particularly as it pertains to bile duct injury.<sup>6</sup> One major difference between 4-port laparoscopic cholecystectomy and its less invasive counterparts, NOTES and SILC, is the technique to gain entry into the peritoneal cavity. In the traditional 4-port technique, access to the peritoneal cavity can be performed using either a closed or open technique.<sup>7</sup> Complications related to initial trocar insertion include vascular and intestinal injury, with rate of injury reported in large series from 0% to 0.23%.<sup>8</sup> The present study was conducted to compare pre-emptive versus post-surgery IPLA in controlling postoperative pain after elective laparoscopic cholecystectomy in adult patients. In present study, group I (control) patients received 30 ml normal saline at beginning of surgery and at the end of the surgery, group II patients (preemptive) received 30 ml 0.5% bupivacaine at the beginning of surgery and 30 ml of saline at the end of the surgery and group III patients (post-surgery) received 30 ml of saline at the beginning of surgery and 30 ml of 0.5% bupivacaine at the end of the surgery. Each group had 32 patients.

Palmes et al<sup>9</sup> found that 60 patients belonging to American Society of Anesthesiologists physical status I or II were randomly assigned to receive IPLAI of either 30 ml of normal saline (C) or 30 ml of 0.5% bupivacaine at the beginning (PE) or at the end of the surgery (PS) using a double-dummy technique. The primary outcome at 30 minute, 1, 2, 4, 6, 24 hours after surgery and time to the first request for analgesia and the secondary outcomes were analgesic request rate in 24 hours; duration of hospital stay and time to return to normal activity was recorded. For all predefined time points, VAS in group PE was significantly lower than that in groups C ( $P < 0.05$ ). The time to first analgesic request was shortest in group C ( $238.0 \pm 103.2$  minutes) compared to intervention group (PE,  $409.2 \pm 115.5$  minutes; PS,  $337.5 \pm 97.5$  minutes;  $P < 0.001$ ). Time to attain discharge criteria was not statistically different among group. We found that need of rescue anesthesia in group I was seen in 15, 3 in group I and 8 in group

III. Shoulder pain was observed in 21 in group I, 4 in group I and 7 in group III. Time to return to normal activity was 1024 minutes in group I, 1126 in group II and 1168 in group III. 3.1 doses of paracetamol was required in group I, 2.4 in group II and 2.7 in group III. The difference was significant ( $P < 0.05$ ). Karaaslan et al<sup>10</sup> reviewed 1000 consecutive patients who underwent consecutive cholecystectomies. The laparoscopic approach was attempted in all but one patient and was successful in 94.1% of patients. The conversion rate was higher with acute cholecystitis than with other forms of biliary tract disease. Successful cholangiography was accomplished in over 97% of patients. Nineteen complications directly related to the surgical procedure were found, including one bile duct injury.

## CONCLUSION

Authors found that Pre-emptive intraperitoneal local anaesthetic instillation resulted in less pain intensity and shoulder pain in patients underwent LC.

## REFERENCES

1. Sakpal SV, Bindra SS, Chamberlain RS. Laparoscopic cholecystectomy conversion rates two decades later. *JLS*. 2010;14: 476–483.
2. Litwin DE, Cahan MA. Laparoscopic cholecystectomy. *Surg Clin North Am*. 2008;88:1295–1313.
3. Neugebauer E, Troidl H, Spangenberg W, Dietrich A, Lefering A. Conventional versus laparoscopic cholecystectomy and the randomized controlled trial Cholecystectomy Study Group. *Brit J Surg*. 1991;78:150–154.
4. Azevedo JL, Azevedo OC, Miyahira SA, et al. Injuries caused by Veress needle insertion for creation of pneumoperitoneum: A systematic literature review. *Surg Endosc*. 2009;23:1428–1432.
5. Gurusamy KS, Nagendran M, Toon CD, Guerrini GP, Zinnuroglu M, Davidson BR. Methods of intraperitoneal local anaesthetic instillation for laparoscopic cholecystectomy. *Cochrane Database Syst Rev*. 2014;25:CD009060.
6. Lee IO, Kim SH, Kong MH, Lee MK, Kim NS, Choi YS, et al. Pain after laparoscopic cholecystectomy: The effect and timing of incisional and intraperitoneal bupivacaine. *Can J Anaesth*. 2001;48:545–50.
7. Kahokehr A, Sammour T, Srinivasa S, Hill AG. Systematic review and meta-analysis of intraperitoneal local anaesthetic for pain reduction after laparoscopic gastric procedures. *Br J Surg*. 2011;98:29–36.
8. Gurusamy KS, Nagendran M, Guerrini GP, Toon CD, Zinnuroglu M, Davidson BR. Intraperitoneal local anaesthetic instillation versus no intraperitoneal local anaesthetic instillation for laparoscopic cholecystectomy. *Cochrane Database Syst Rev*. 2014;13:CD007337.
9. Palmes D, Röttgermann S, Classen C, Haier J, Horstmann R. Randomized clinical trial of the influence of intraperitoneal local anaesthesia on pain after laparoscopic surgery. *Br J Surg*. 2007;94:824–32.
10. Karaaslan D, Sivaci RG, Akbulut G, Dilek ON. Preemptive analgesia in laparoscopic cholecystectomy: A randomized controlled study. *Pain Pract*. 2006;6:237–41.