

A study to evaluate the efficacy of pre operative subcutaneous Local Anesthetic for pain management in Laparoscopic Cholecystectomy

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ABSTRACT:

Aim: To study the effectiveness of local anesthetics in managing post operative pain in patients undergoing laparoscopic cholecystectomy.

Method and material: The patients were randomly assigned to either of the groups and the patients in group 1 (n=20) received systemic analgesia and 0.2% (2 mg / ml) pre emptive ropivacaine sub cutaneously before trochar insertion while group 2 patients (n=20) received systemic analgesia only .Pain intensity was measured at fixed time interval at 6hrs, 12hrs, 24hrs, and 48hrs respectively and the analgesia requirement was calculated and compared for both group.

Results: The VAS was significantly less in group 1 at 6 and 12 hour time interval and the difference was statistically significant. The rescue drug given at different time interval was also statistically significant in both the groups with group 1 patients requiring less rescue drug than group 2 at 6 and 12 hour after the surgery.

Conclusion: Our study demonstrated that infiltration of the trocar site with long lasting anaesthetics is extremely effective for the treatment of post-operative pain control after laparoscopic cholecystectomy.

Keywords:cholelithiasis, cholecystectomy.

INTRODUCTION

Today all over the world, for symptomatic cholelithiasis; the first and most common treatment modality used is laparoscopic cholecystectomy . It has been performed as a day case procedure more than decades now.¹

Despite the laparoscopic method, post-operative pain is still the most common complaint among patients after cholecystectomy; in fact, pain can prolong hospitalisation and increase post-operative morbidity, such as pulmonary problems. Because many of these operations are being performed as day cases, it is very crucial to prevent and relieve post-operative discomfort as much as possible.²

Sensitization of the peripheral and central pain pathways occurs as a result of the transmission of pain signals elicited by tissue injury. Pre-emptive analgesia is a type of

analgesia that is used before a surgical procedure to reduce sensitization. Pre-emptive analgesia has the potential to be more successful than a similar analgesic treatment postoperatively because of this 'protective' effect on the nociceptive system.³

Pain after laparoscopic cholecystectomy can be divided into three categories: visceral discomfort, parietal pain, and shoulder pain.⁴ In the first several days after surgery, parietal and visceral pain are roughly equal in importance.

From several years, the use of local anaesthesia, either during or after surgery, has been employed as a technique of minimising post-surgical pain. Local tissue infiltration appears to be quite efficient in preventing and controlling post-operative pain in the first 24 - 48 hours, with pain severity actually decreasing after that time.⁵

Local tissue infiltration offers several advantages, that include simplicity, safety, and low cost. In the present study the effectiveness of local anaesthesia in managing post operative pain in patients undergoing laparoscopic cholecystectomy was evaluated.

MATERIAL AND METHOD

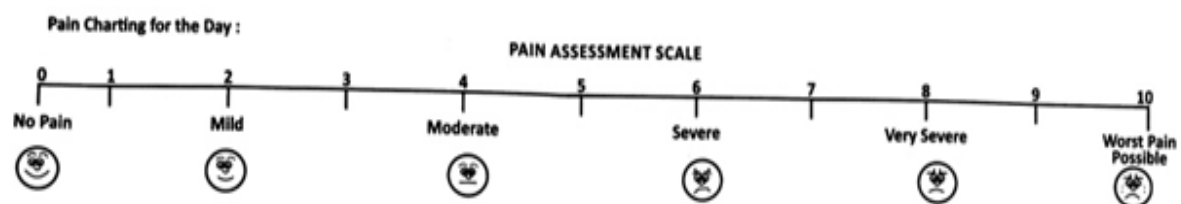
The present study was conducted in patients undergoing laparoscopic cholecystectomy in Maharishi Markendeshwar Medical College and Hospital Kumarhatti Solan from October 2020 to May 2021 after approval from college ethical committee. The patient who gave consent were included in the study. Patients with common bile duct stone, Acute pancreatitis, known carcinoma gallbladder, Peritonitis, and Cholangitis were excluded from the study.

The patients were randomly assigned to either of the groups and the patients in group 1 (n=20) received systemic analgesia and 0.2% (2 mg / ml) pre-emptive ropivacaine subcutaneously before trochar insertion while the patients in group 2 (n=20) received systemic analgesia only. Pain intensity was measured at fixed time interval at 6hrs, 12hrs, 24hrs, and 48hrs respectively and the analgesia requirement was calculated and compared for both group.

The pneumo-peritoneum was established via closed laparoscopy method using veress needle; initially slow flow (1 l/m) and then faster flow (maximum 2-3 L/min) was administered to avoid a vasovagal reaction. Intra abdominal pressure was maintained at 12 mmHg; Carbon dioxide was evacuated through the ports by applying a gentle pressure all over the abdomen. All operations were performed in elective surgery OT with the standard four port technique: 10mm infraumbilically and subxiphoid in the epigastrium, 5mm in the right subcostal area on the mid clavicular line and another one on the anterior axillary line. Patients in group 2 received 10 ml of ropivacaine subcutaneously before trochar insertion in 10mm ports while in 5mm ports 7ml of ropivacaine was given.

Postoperative routine analgesia was in paracetamol 1 g in both the groups 8 hourly and in diclofenac 75mg was given as a rescue analgesia SOS, at patient's request. Discharge was planned in 48 hours.

Pain Assessment:



RESULTS AND OBSERVATIONS

Table 1 shows comparison between VAS scale and it was observed that the VAS was significantly less in group 1 at 6 and 12 hour time interval. The difference was statistically significant. Similarly table 2 a and b shows the rescue drug given at different time interval and again it was statistically significant in both the groups with group 1 patients requiring less rescue drug than group 2 at 6 and 12 hour after the surgery.

Table 1:COMPARISON OF VAS SCORE AT DIFFERENT TIME INTERVALS

VAS score	Group 1		Group 2		P value
	mean	SD	mean	SD	
6 hourly	3.4	1.81	6.6	2.99	.001
12 hourly	1.1	1.07	4.5	2.06	.001
24 hourly	0.75	1.02	0.8	0.89	.870
48 hourly	0.3	0.48	0.3	0.65	.786

Table 2 a:RESCUE DOSAGE GIVEN AT 6 HOURS POST OPERATIVELY

Rescue dosage at 6 hourly	Not given	given	total	Chi square
Group 1	15	5	20	.004
Group 2	6	14	20	
Total	21	19	40	

Table 2 B: RESCUE DOSAGE GIVEN AT 12 HOURS POST OPERATIVELY

Rescue dosage at 12 hourly	Not given	given	total	Chi square
Group 1	20	0	20	.008
Group 2	14	6	20	
Total	34	6	40	

DISCUSSION

Despite major advancements in laparoscopic cholecystectomy, postoperative pain remains a serious issue, with up to 80% of patients requesting analgesics after the procedure, according to most publications.⁶ The level of pain peaks in the first 48 to 72 hours after surgery and then steadily decreases.⁷

Few studies have documented clearly the effect of intraperitoneal and/or trocar site infiltration with long-acting anesthetics on postoperative laparoscopic cholecystectomy pain. In present study patients who were given ropivacaine had significantly less discomfort and needed less rescue analgesia than the other group at 6 and 12 hourly however no significant association was seen at 24 and 48 hour.

Our results were similar to the study conducted by Dath and Park who in their study injected bupivacaine at the port sites intraoperatively before wound closure and showed that postoperative pain 6 h after surgery was significantly less, however no difference was seen between the groups at 10 and 24 h postoperatively. Narcotic usage in their study was not significantly different because the local anesthetic was injected after the local pain mediators had been released. Accordingly, only immediate pain relief was achieved, which reflects the time effect of bupivacaine.⁸

In other study by cantore et al in 2008 compared the effectiveness of local anesthetics given pre operatively(group 1) and post operatively(group 2) at trocar site. They showed that the mean intravenous Ketorolac used was significantly more for the post operative than the pre

operative group ($p < 0.04$). The mean VAS was 10.7 for post operative group versus 5.1 for pre operative group ($p < 0.02$). Their results were statistically significant.²

Hasaniya et al in their study also showed that injecting long-acting local anesthetic such as bupivacaine at the site of surgery results in significant reduction of postoperative pain both immediately and 24 h after surgery.⁹

Sarach et al in their study investigated whether local anesthetic infiltration given at different timing of surgery at trocar sites during LC decreases the postoperative pain. They showed that in the preoperative LA group, 50% of patients and in the postoperative LA group 28% of patients required analgesics compared with 76% in the control group.¹⁰

When compared to bupivacaine, ropivacaine is a long-acting amide local anaesthetic with a potentially enhanced safety profile. Ropivacaine is less lipophilic than bupivacaine and has a lower likelihood of penetrating big myelinated motor fibres, resulting in less motor blockage.^{11,12} Ropivacaine has a higher degree of motor sensory distinction than other anaesthetics. It works just on the pain-transmitting A and C nerves, not on the A fibres, which are involved in motor function. Numerous research comparing ropivacaine and bupivacaine found that ropivacaine has fewer cardiac and central nervous system toxic effects, less motor block, and a similar duration of sensory analgesia action as bupivacaine.^{13,14}

CONCLUSION

Our study demonstrated that infiltration of the trocar site with long lasting anaesthetics is extremely effective for the treatment of post-operative pain control after laparoscopic cholecystectomy.

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