

INTRAINCISIONAL VS INTRAPERITONEAL INFILTRATION OF LOCAL ANAESTHETIC FOR CONTROLLING POST-LAPAROSCOPIC CHOLECYSTECTOMY PAIN

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Abstract

Background: The study was designed to compare the effect of intraincisional vs intraperitoneal infiltration of levobupivacaine 0.25% on post-operative pain in laparoscopic cholecystectomy.

Methods: This randomised controlled study was carried out on 189 patients who underwent laparoscopic cholecystectomy. Group 1 was the control group and did not receive either intraperitoneal or intraincisional levobupivacaine. Group 2 was assigned to receive local infiltration (intraincisional) of 20 ml solution of levobupivacaine 0.25%, while Group 3 received 20 ml solution of levobupivacaine 0.25% intraperitoneally. Post-operative pain was recorded for 24 hours post-operatively

Results: Post-operative abdominal pain was significantly lower with intraincisional infiltration of levobupivacaine 0.25% in group 2. This difference was reported from 30 minutes till 24 hours post-operatively. Right shoulder pain showed significantly lower incidence in group 2 and group 3 compared to control group. Although statistically insignificant, shoulder pain was less in group 3 than group 2.

Conclusion: Intraincisional infiltration of levobupivacaine is more effective than intraperitoneal route in controlling post-operative abdominal pain. It decreases the need for rescue analgesia.

Keywords: Laparoscopic cholecystectomy, levobupivacaine, local anaesthetics, postoperative pain

Introduction

Laparoscopic cholecystectomy (LC) is the treatment of choice in treating Gall bladder disease substituting the conventional open method of cholecystectomy. LC has improved surgical outcome in term of reduced pain, morbidity, duration of convalescence, better cosmetic results and shorter hospitalisation.¹

Although it is a minimally invasive procedure but pain has been mentioned as major complain and a reason for delayed post-operative recovery. The pain intensity usually peaks during early post-operative hours. Thus pain relief and patient comfort during early post-operative period is important as the pain and side effects of analgesic may delay discharge.²

The origin of pain after LC is multifactorial with different pain components secondary to different pain mechanisms. Pain arising from incisional site (Somatic Pain), pain arising from intra-abdominal trauma due to gall bladder removal (Visceral Pain) and referred shoulder pain due to diaphragmatic irritation caused by residual CO₂ in peritoneal cavity. In addition to discomfort and post-operative physiological repercussions such as respiratory

restrictions, tachycardia and hypertension, pain delays early ambulation and hospital discharge.³

Material and Method

This study will be conducted on 80 patients of ASA grade I & II, 18 to 65 years of age & both sexes undergoing elective laparoscopic

Study design: Comparative prospective randomized controlled double blind hospital based study.

Inclusion Criteria

ASA Grade I & II,
Age 18-65 yrs both sex

Exclusion Criteria

Age <18 years and >65 years
Patients with known allergy to the drug used in study
Diabetic Patients
Neuromuscular diseases
Patients on β -blocker
Patients on calcium channel blocker
Pregnant and lactating women

Epilepsy
Anticipated difficult intubation
Cardiopulmonary diseases
Hepatorenal diseases
Metabolic diseases.

Included patients were randomised prospectively, using a blind envelope system, into three groups of 63 persons each; there were no dropouts after randomisation. Group 1 was the control group and did not receive either intraperitoneal or intraincisional levobupivacaine.

Group 2 was assigned to receive local infiltration (intraincisional) of 20 ml solution of levobupivacaine 0.25% at the end of operation before closure of the wound.

Group 3 received 20 ml solution of levobupivacaine 0.25% intraperitoneally in the gall bladder bed and under the right copula of the diaphragm at the end of the laparoscopic procedure.

Following the anaesthetic assessment, patients were admitted to the hospital the day before the operation. All patients received the same anaesthetic technique. Usual monitoring was used including heart rate, respiratory rate, continuous ECG, SpO₂ and non-invasive arterial blood pressure. Creation of CO₂ pneumoperitoneum at 14 mm Hg pressure was justified in all patients and standard

laparoscopic cholecystectomy using the 4-port technique was performed. All the operations were performed by one team of surgeons that is experienced in laparoscopic surgery.

For intraincisional infiltration of levobupivacaine, the fascia, muscle and preperitoneal space were infiltrated using 5 ml for each port (infiltration of four trocar sites, thus using a total of 20 ml solution). For intraperitoneal instillation, the solution was instilled in the gall bladder bed and under the right diaphragm following the removal of the gallbladder. This was done using a catheter inserted through the right subcostal port. No abdominal drainage was used to any patient.

All patients received analgesics to a standard post-operative protocol with Diclofenac 75 mg intramuscularly at the end of the operation and further 50 mg per oral route twice a day. Pethidine, as a rescue analgesia, was administered on request 10 to 20 mg intravenously in the recovery room and 50 mg intramuscularly in the ward. The number of patients requiring rescue analgesia was recorded in each group.

Results

Analysis of the demographic characteristics of the studied patients has shown that all groups were matched as regarding age, gender and weight.

Table 1: Postoperative VAS scores

Time	Group-I		Group-II		Group-III		p-value		
	Mean	SD	Mean	SD	Mean	SD	I&II	I&III	II&III
T0	4.06	1.31	2.33	0.76	2.4	0.62	0.001	0.001	0.711
T1	4.07	0.82	2.3	0.70	2.2	0.61	0.001	0.001	0.558
T2	2.56	0.57	2.3	0.75	2.36	0.71	0.25	0.234	0.726
T3	2.5	0.51	2.4	0.56	2.83	0.98	0.471	0.107	0.041
T4	3.4	0.81	2.77	0.85	2.27	1.11	0.05	0.007	0.046
T5	3.23	1.04	2.67	1.29	1.7	1.05	0.069	0.001	0.02
T6	2.53	1.04	0.83	0.69	0.93	0.90	0.001	0.001	0.634

Post-operative abdominal pain was significantly lower in group 2 (intraincisional infiltration of levobupivacaine 0.25%) than control group and group 3 (intraperitoneal infiltration of levobupivacaine 0.25%). This difference was reported from 30 minutes till 24 hours post-operatively. Although pain scores are less in group 3 when compared with the control group, yet it is not statistically significant.

Discussion

Laparoscopic cholecystectomy is one of the commonest day-case surgeries. The post-operative pain associated with this minimally invasive procedure is generally less intense and lasts a shorter time than that follow open cholecystectomy but it remains a prevalent problem of the early post-operative period and may delay discharging the patient, especially in day-case departments. It reaches a peak within the first few hours following the operation but diminishes with time.⁴ The origin of pain after

laparoscopic cholecystectomy is multifactorial with pain arising from the incision sites (somatic pain), from the gallbladder bed (visceral pain) and as a consequence of a pneumoperitoneum.⁵

Many researchers have suggested that the combination of somatovisceral local anaesthetic treatment reduces incisional, intra-abdominal and shoulder pain in laparoscopic cholecystectomy. These local agents induce antinociception by acting on the nerve membranes. They reversibly decrease the rate of depolarisation and repolarisation of excitable membranes (like nociceptors).⁶ There are different routes to administrate the local anaesthetic drug; some researchers have shown that local parietal anaesthesia is effective in controlling post-operative pain,⁷ while others have shown that it is not effective.⁸

A significant number of trials have examined the intraperitoneal administration of local anaesthetics in laparoscopic cholecystectomies as regards to post-operative pain and narcotic analgesic consumption, with promising results. 8,9 However, other studies indicate that the post-operative analgesia and narcotic usage was not significantly different in the groups that received local anaesthesia. 10

Conclusion

In conclusion, the present study showed that intraincisional infiltration of levobupivacaine is more effective than intraperitoneal route in controlling post-operative abdominal pain. It decreases the post-operative analgesia requirements.

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