

## Research Article

# Effect of intraperitoneal bupivacaine on postoperative pain and sympathoadrenal response following laproscopic cholecystectomy

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### ABSTRACT

**Background:** Pain after laproscopic surgeries is highest in the upper abdomen. Pain is greatest after operation and decreases within 24 hours. Due to adverse effects of opioids, multimodal analgesia with smaller doses of opioids, local anaesthetics and NSAIDS is given. The aim of postoperative pain relief is to provide subjective comfort and to blunt the autonomic and somatic responses to pain to enhance restore normal function so that patient can go home early.

**Methods:** 30 Patients each of study group (bupivacaine) and control group (normal saline) of class 1 and class 2 of American society of anaesthesiology of either sex were taken. 20cc of bupivacaine or normal saline sprayed in gall bladder fossa. Vital parameter visual analog scale score and blood sugar was noted.

**Results:** The two groups were comparable regarding age, sex and body mass index. VAS score was significantly reduced in study group. Mean blood sugar showed no significant difference in two groups.

**Conclusions:** Intraperitoneal instillation of bupivacaine is safe and reduces pain in early postoperative period.

**Keywords:** Laproscopic, Cholecystectomy, Intraperitoneal, Pain, Sympathoadrenal, Blood sugar, Bupivacaine, Postoperative, General anaesthesia

## INTRODUCTION

Pain after Laproscopic surgeries is highest in the upper abdomen.<sup>1</sup> Pain is greatest after operation and decreases within 24 hours. Due to adverse effects of opioids, multimodal analgesia with smaller doses of opioids, local anaesthetics and NSAIDS is given. Intracavitary instillation of local anaesthetics is said to be simple and effective technique for providing pain relief during the early postoperative period after laproscopic procedures. The intraperitoneal drugs are sprayed over the gall bladder blade and the diaphragmatic surface of the liver. The rationale for this route of administration is that the peritoneum is exposed to a local anaesthetic block of visceral nociceptive conduction, thereby providing an

additional mechanism of analgesia. However, absorption from the large peritoneal surface may also occur, and this may be a further mechanism of analgesia.

## METHODS

Sixty American society of anaesthesiology (ASA) Class 1 and Class 2 adult patient of either sex posted for elective laproscopic cholecystectomy participated in this double blind and randomised study. After written consent patients were randomly allocated to either study group (bupivacaine) 30 patients or control group (normal saline) 30 patients. Exclusion criteria was patient unwilling to give consent patient with history of allergy to drug, patient with acute cholecystitis, ASA 3 and ASA 4

patients. After confirming adequate starvation, monitors attached and routine general anaesthesia was given. Intra-abdominal pressure was maintained between 10 to 12 mm of HG. After gall bladder was excised 15 degree head low and right tilt was given. A preaspirated syringe of 20cc 0.5% bupivacaine or placebo was sprayed in gall bladder fossa. Anaesthetist and surgeon were blinded about the drug sprayed. During postoperative period all patients were monitored for haemodynamic changes, respiratory rate, blood sugar, VAS assessment, rescue analgesia, site of pain and side effects of bupivacaine at 0, 2, 4, 8, 12, 18 and 24 hours after surgery.

**RESULTS**

Results were subjected to statistical analysis. It was done by independent t-test and chi-square test. P-value <0.05 was considered significant. Preoperative hemodynamics and respiratory rate did not show any statistical significance.

**Table 1: Vas postoperative.**

VAS	Study group (N=30)	Control group (N=30)	p-value
0 hours	0.43±1.194	1.20±1.910	0.066
2 hours	1.90±1.826	4.43±1.591	0.000
4 hours	2.60±1.653	3.80±2.156	0.019
8 hours	3.37±1.810	3.67±1.807	0.523
12 hours	4.03±2.189	4.27±1.893	0.66
18 hours	3.47±1.943	3.63±1.991	0.744
24 hours	2.67±1.241	3.60±1.754	0.021

By independent ‘t’ test ; p <0.05; Significant; There was significant reduction of pain.

VAS was found to be significantly reduced in study group as compared to control group. In the study group 39.96% of patients received their first dose of rescue analgesia at the end of 4<sup>th</sup> postoperative hour as compared with 96.66 of control group. Comparison between mean blood sugar readings showed no significant difference between two groups at the end of 2<sup>nd</sup> hour. Most common site of pain was right hypocondrium.

**Table 2: Comparison of preoperative versus 2<sup>nd</sup> postoperative hour blood sugar.**

	Pre op blood sugar (mg/dl)	Post op blood sugar (mg/dl)	p-value
Study group N=30 Mean±SD	91.07±15.957	102.13±56.069	0.241
Control group N=30 Mean±SD	84.87±13.346	88.83±26.882	0.481

By independent t test; P >0.05- not significant; Treatment with bupivacaine showed no significant difference.

**DISCUSSION**

In 17-41% of patients, pain is the main reason for overnight staying in the hospital on the day of surgery.<sup>3</sup> Pain is intense on day of surgery and subsequently decline to low level within 3-4 days.<sup>3</sup> Different modalities have been proposed to reduce pain after laproscopic cholecystectomy of which one of is intraperitoneal instillation of bupivacaine. Local anaesthetic prevent transmission of nerve signals from site of trauma to the spinal cord and reduce neurogenic inflammation at trauma site.<sup>4</sup> The rational for intraperitoneal route of administration is that peritoneum is exposed to blocking of visceral nociceptive conduction, thereby providing additional mechanism for analgesia. This study was undertaken to assess the effectiveness of intraperitoneal bupivacaine instillation for postoperative pain relief. The design was a prospective double blind randomised control trial. The groups were comparable with regards to age and body mass index. Duration of surgery was similar in both groups. Visual analog scale (VAS) was rated in standardise way where 0 represented no pain, 5 represented moderate pain and 10 represented worst pain. Patient of study group required less number of doses of rescue analgesia as compared to control group in 24 hours. The choice of local anaesthetic was made on the basis of size of area involved in surgery, a volume of 20 ml was the minimum quantity required for coverage on all levels.<sup>5,6,7</sup> 0.5% concentration of local anaesthetic was chosen after comparison of the experience listed in literature.<sup>6</sup> Sympatho-adrenal response was seen by doing blood sugar. None of the patient had bupivacaine toxicity or adverse effect. To conclude, intraperitoneal instillation is safe and reduces pain in early postoperative period.

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