

Postoperative Analgesia In Laparoscopic Cholecystectomy: A Comparative Study Using Bupivacaine Instillation And Infiltration Versus Parenteral Analgesia (Tramadol).

S Shabir, B Saleem, A Hakim, H A. M.

Citation

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Abstract

In a prospective randomized double blind clinical study, 120 patients of either sex in the age group of 25-65 years with ASA I and II, who were scheduled to undergo elective laparoscopic cholecystectomy were allocated to two groups of 60 patients each with regard to postoperative analgesia. In Group-I (n=60) the patients received Bupivacaine (0.5%) 20ml, instilled in gallbladder bed and the undersurface of diaphragm and infiltration of port wounds. In Group-II (n=60) the patients were provided with postoperative analgesia with Tramadol (100mg) given intramuscularly (IM) at the completion of procedure. The postoperative analgesia was assessed using Visual Analogue Scale (VAS) at hourly intervals for first four hours and then 24 hours also. Vital signs like Spo₂, HR, NIBP, RR were recorded six hourly for 24 hours postoperatively. There was statistically significant (p value<0.05) better analgesia in Group-II (Tramadol group) as compared to Group-I (Bupivacaine group).

INTRODUCTION

The use of laparoscopic techniques in general surgery has gained increasing popularity in last few decades. The small limited incisions are well accepted by patients and there is the benefit of a faster recovery (compared to open laparotomy). Health care costs may be decreased by the diminished length of postoperative stay and by reducing the need of postoperative analgesia. Additionally, indirect savings to the society may be generated by shortening the recovery period between the operative procedure and the return of gainful employment.

Relief of pain both intraoperative and postoperative forms an important part of good anesthetic technique. The incidence and sensation of postoperative pain varies with the individual patient, but is largely governed by the site and nature of operation. Upper abdominal and intra-thoracic surgeries cause more pain and distress and are associated with an increased incidence of pulmonary complications as compared to lower abdominal surgeries and surgeries of extremities.

There are various modalities available for postoperative pain relief. These range from parenteral analgesia, epidural

analgesia and peripheral nerve blocks.

Reduction in surgical trauma in the laparoscopic versus open procedures should result in a reduction of postoperative pain, lessened requirements for opioids and earlier return to normal activity.

In an effort to further reduce the opioid requirement, non-steroidal anti-inflammatory drugs [NSAIDS] have been administered along with the conventional opioids on demand.

It has been found that use of local anesthetic (bupivacaine) in port wounds almost abolishes any memory of a laparoscopic procedure in a day care unit, so the study to compare the post operative analgesia in patients undergoing laparoscopic cholecystectomy using different post operative analgesic techniques was undertaken.

MATERIAL AND METHOD

After getting the study protocol approved by the ethical committee of our institution i.e. GMC Srinagar, 120 patients of either sex in the age group of 25-65 years of ASA I & II, who were scheduled to undergo laparoscopic

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cholecystectomy, were included in this prospective double blinded randomized clinical study. Informed consent for inclusion in the study was obtained from each patient.

A detailed history, physical examination and laboratory Investigations were performed in all the patients. On the evening before surgery, the visual analogue scale (VAS) scoring system was explained to all patients.

All patients were premedicated with oral diazepam (10 mgs) administered on night prior to surgery as night sedation. On the day of surgery, all patients were premedicated with midazolam (2-3 mgs IV) in the holding up area before transferring the patient to operating room and baseline parameters were documented like HR, NIBP, Spo2 and ECG (Lead II).

All patients were induced and maintained with standard anesthetic technique i.e. induced with buprenorphine (3-4 mgs) and propofol (2 mgs) and tracheal intubation was facilitated with atracurium (0.4- 0.5 mgs/kg). The anesthesia in all patients was maintained oxygen in air (50%:50%) with Isoflurane supplementation. The muscle relaxation was maintained by the incremental doses of atracurium (0.1mg/kg) as and when required.

Immediately after intubation a nasogastric tube was introduced and stomach contents were aspirated prior to tilting of the patient and nasogastric tube was removed just before extubating the patient.

For postoperative analgesia, the patients were randomly allocated in to two groups.

GROUP-I: These patients received bupivacaine (0.5%) 20 ml intraperitoneally instilled under gall bladder bed and under surface of diaphragm and infiltration at the port wounds using 0.125% bupivacaine. No parenteral analgesia was administered for at least four hours post operatively except for rescue analgesia, in case the VAS was more than 4 cm in any patient in this group.

GROUP-II: The patients in this group were provided postoperative analgesia using tramadol (100mg IM) administered at the completion of surgery. No further analgesia was given for at least four hours post operatively in this group also except for rescue analgesia.

Postoperative pain intensity was assessed using 10 point VAS, 0=no pain, 10=most severe pain. VAS scoring was done at hourly intervals over first four hours and at 24 hours

post operatively also.

Vital signs like heart rate, blood pressure, respiratory rate, temperature and oxygen saturation were also continuously monitored on hourly basis for 24 hours postoperatively.

The statistical analysis of the data obtained was performed using ANOVA method. p-value of <0.05 was regarded as statistically significant.

RESULTS

The demographic profile i.e., age, sex, weight, physical status (ASA status) between the two groups was more or less similar and was statistically insignificant.

The intra operative hemodynamic parameters were comparable between the two groups.

When the postoperative analgesia, as assessed by VAS pain scoring was compared between the two groups at different time intervals, it was found at one hour after operation, the analgesia was significantly better in group-II (tramadol group) as compared to group-I (bupivacaine group). This difference persisted at 2nd and 3rd postoperative hours. However when the post operative analgesia was compared at 4th hour of post operative period between the two groups, the statistical difference was insignificant and again at 24th hour, the statistical difference was insignificant.

So overall a better analgesia was observed in patients who received parenteral analgesia (tramadol) as compared to patients who were given local anesthetic (bupivacaine) instillation and infiltration for postoperative analgesia.

Figure 1

TABLE-I : Demographic Data (Mean ±SD)

Parameters	Group-I	Group-II	p-value	Remarks
Age (years)	41.43 ±5.11	42.53 ±9.32	0.497	Non-significant
Weight (kg)	57.30 ±8.85	56.60 ±9.48	0.786	Non-significant
Sex (M:F)	16:44	18:42	0.796	Non-significant
ASA (I:II)	36:24	42:18	0.806	Non-significant

Figure 2

TABLE-II: Mean post-operative pain score on Visual Analogue Scale (VAS) at various time intervals in the two groups of patients (Mean \pm SD).

Time	Group-I (VAS) Mean \pm SD	Group-II (VAS) Mean \pm SD	p-value	Remarks
1 Hr	3.50 \pm 0.82	2.20 \pm 0.82	0.000	Highly Significant
2 Hrs	2.80 \pm 1.09	1.83 \pm 1.05	0.002	Significant
3 Hrs	2.00 \pm 1.14	1.40 \pm 1.04	0.014	Significant
4 Hrs	1.30 \pm 1.02	1.07 \pm 1.05	0.741	Non-significant
24 Hrs	0.06 \pm 0.72	0.70 \pm 0.65	0.351	Non-significant

DISCUSSION

The results of our study are more or less in accordance with the results of other workers, Vicker MD et al (1992), Houmes RM et al (1992), Rademaker BMP et al (1994), Joris J. et al (1995), and Michaloliakov C. et al (1996).

The results of our study indicate that intraperitoneal administration of 20 ml of 0.5% bupivacaine is not as effective as intramuscular Tramadol in reducing postoperative pain after laparoscopic cholecystectomy.

Narchi P et al (1991) observed that 0.5% bupivacaine (80 ml) was effective in reducing postoperative pain after day case diagnostic laparoscopy. In contrast Walling GLC et al (1998) could not demonstrate any effect on postoperative analgesia of bupivacaine 2ml/kg dissolved in 300 ml of isotonic saline administered intraperitoneally after laparoscopic cholecystectomy.

The effective analgesia observed by Narchi P et al (1991) could be attributed to the larger doses of local anesthetic used by these workers. Larger doses are however not without the risk of toxicity. In our present study, bupivacaine was used in the dosage of 1-2 mg/kg as 0.5% solution. Thus the apparent contradiction with the study of Narchi P. et al (1991) is explained.

It is possible that larger doses of intraperitoneal local anesthetic might have improved postoperative analgesia. In theory, however, the administration of larger doses of local anesthetics directly after laparoscopic cholecystectomy would result in toxic concentration because of increased absorption from fresh liver surgical wound.

Minor laparoscopic gynecological procedures are performed in the head down position. Instillation of local anesthetic in

this position may improve analgesia, because the drug is expected to flow over celiac plexus and phrenic nerve endings (Thompson GE et al; 1998). In contrast in our patients, local anesthetic may flow with gravity away from celiac plexus and phrenic nerve endings.

Another explanation for the lack of effectiveness of local anesthetic administered intraperitoneally after laparoscopic cholecystectomy may be that this technique does not adequately block relevant nociceptive input.

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Author Information

Shabir Ahmad Shabir

Assistant Consultant, Anesthesiology & ORs, KFMC

Basharat Saleem

Associate Professor, Dept Of Anesthesia

Abdul Hakim

Lecturer, Anesthesia

Hashia A. M.

Ex-Professor & Head, Dept Of Anesthesia