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Assessment of the usefulness of bupivacaine in controlling pain after laparoscopic cholecystectomy

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Abstract

Background: Laparoscopic cholecystectomy is an established form of treatment for patients with symptomatic gallstone disease. The present study was conducted to assess the usefulness of bupivacaine in controlling pain after laparoscopic cholecystectomy.

Materials & Methods: The present study was conducted on patients who underwent laparoscopic cholecystectomy of both genders. Patients were divided into 2 groups. Group I patients were given 20 ml of saline injected under vision into the region of the gallbladder bed and group II patients were given 20 ml of 0.25% bupivacaine. In both groups, postoperative pain was assessed with a visual analogue scale (VAS) at 1 hour, 3 hours 6 hours and 8 hours.

Results: Group I had 12 males and 13 females while group II had 10 males and 15 females. The mean VAS score in group I was 4.2 and in group II was 2.3 at 1 hour, at 3 hours was 3.6 and 2.0 at 3 hours in both groups, at 6 hours was 2.4 and 1.8 in group I and group II respectively. At 8 hours was 1.6 and 1 in group I and group II respectively. At 1 hour and 3 hours, difference was significant ($P < 0.05$).

Conclusion: It was seen that administration of intraperitoneal bupivacaine is a simple and effective method for postoperative pain relief after laparoscopic cholecystectomy.

Keywords: Bupivacaine, intraperitoneal, laparoscopic cholecystectomy

Introduction

Laparoscopic cholecystectomy is an established form of treatment for patients with symptomatic gallstone disease. As the method is relatively new there is no general agreement on effective postoperative pain control. Recent studies have shown that patients may experience considerable pain after laparoscopic cholecystectomy. Pain remains the predominant complaint after LC in the initial 24 h postoperatively. Effective post-operative analgesia after LC remains a clinical challenge^[1].

Different methods are used such as non-steroidal, anti-inflammatory, analgesic suppository, infiltration of wounds with local anaesthetic and intermittent, intramuscular narcotics. None of these methods has been assessed or compared in laparoscopic cholecystectomy. It is recognized that after laparoscopy shoulder-tip pain is a common complaint and may delay discharge from hospital^[2].

Most of the studies have used bupivacaine irrigation of peritoneal cavity in low volume (20 ml to 100 ml) and high concentration (0.5%–0.125%). However, their analgesic action is effective for only a few hours in the post-operative period^[3]. Bupivacaine is a medication used to decrease feeling in a specific area. It is injected around a nerve that supplies the area, or into the spinal canal's epidural space. It is available mixed with a small amount of epinephrine to increase the duration of its action. It typically begins working within 15 minutes and lasts for 2 to 8 hours^[4]. The present study was conducted to assess the usefulness of bupivacaine in controlling pain after laparoscopic cholecystectomy.

Materials & Methods

The present study was conducted in the department of Anesthesia. It comprised of 50 patients underwent laparoscopic cholecystectomy of both genders. All were informed and written consent was obtained. Ethical clearance was obtained prior to the study.

Patients were divided into 2 groups. Group 1 patients were given 20 ml of saline injected under vision into the region of the gallbladder bed and group II patients were given 20 ml of 0.25% bupivacaine. In both groups, postoperative pain was assessed with a visual analogue scale (VAS) at 1 hour, 3 hours, 6 hours and 8 hours.

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Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table I: Distribution of patients

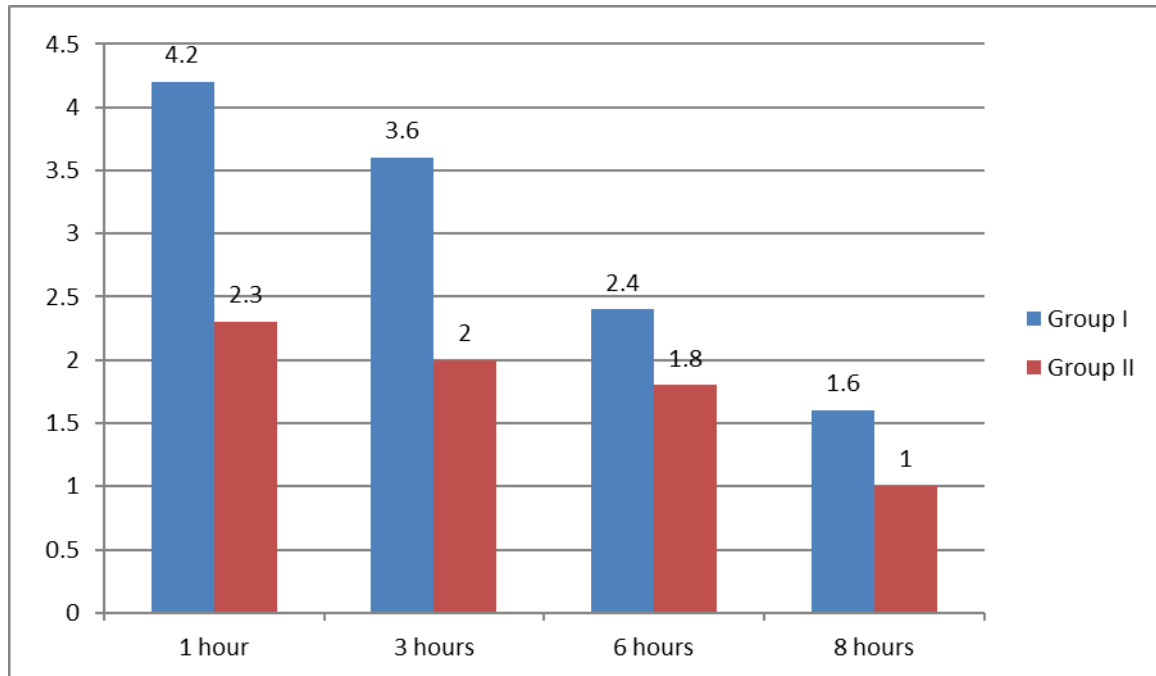
Groups	Group I (Saline)		Group II (Bupivacaine)	
Gender	Male	Female	Male	Female
Number	12	13	10	15

Table 1 shows that group I had 12 males and 13 females while group II had 10 males and 15 females.

Table II: Comparison of VAS in both groups

Duration	Group I	Group II	P value
1 hour	4.2	2.3	0.01
3 hours	3.6	2.0	0.05
6 hours	2.4	1.8	0.12
8 hours	1.6	1	0.78

Table 2, graph I shows that mean VAS score in group I was 4.2 and in group II was 2.3 at 1 hour, at 3 hours was 3.6 and 2.0 at 3 hours in both groups, at 6 hours was 2.4 and 1.8 in group I and group II respectively. At 8 hours was 1.6 and 1 in group I and group II respectively. At 1 hour and 3 hours, difference was significant ($P < 0.05$).



Graph I: Comparison of VAS in both groups

Discussion

Laparoscopic cholecystectomy is routine procedure for gall bladder stones. Earlier conventional cholecystectomy was the procedure but nowadays, laparoscopic cholecystectomy is preferred modality because of various advantages. Pain is one of the complaint in most of the patients. Early pain after LC is multifactorial [5]. It is a combination of different pain mechanisms: parietal pain is caused by abdominal wall penetration by trocar; visceral pain is due to dissection of gall bladder and tearing of blood vessels, traction on nerves and peritoneal inflammation are caused by raised intra-peritoneal pressure secondary to CO2 insufflations. While referred pain in the shoulder tip is due to diaphragmatic irritation by residual CO2. Visceral pain is the main contributory factor for abdominal pain after LC. Pain following LC is maximum on the first post-operative day and declines over next 3 to 4 days [6]. The present study was conducted to assess the usefulness of bupivacaine in controlling pain after laparoscopic cholecystectomy. In this study, group 1 patients were given 20 ml of saline and group II patients were given 20 ml of 0.25% bupivacaine. Narchi P *et al.* [7] in their study, sixty consecutive patients were randomly assigned to one of two groups. Patients in group 1 were given 20 ml of saline injected under vision into the region of the gallbladder bed. Patients in group 2 were given 20 ml of 0.25% bupivacaine

in a similar fashion. Postoperative pain was assessed with a visual analogue pain scale and the site of pain was recorded. Patients in the bupivacaine group had less pain in the early postoperative period and a lower incidence of pain in the right hypochondrium.

Bupivacaine is indicated for local infiltration, sympathetic nerve block, and caudal blocks. It is sometimes used in combination with epinephrine to prevent systemic absorption and extend the duration of action [8]. The 0.75% (most concentrated) formulation is used in retrobulbar block. It is the most commonly used local anesthetic in epidural anesthesia during labor, as well as in postoperative pain management. Liposomal formulations of bupivacaine are no more effective than plain solutions of bupivacaine [9]. We found that mean VAS score in group I was 4.2 and in group II was 2.3 at 1 hour, at 3 hours was 3.6 and 2.0 at 3 hours in both groups, at 6 hours was 2.4 and 1.8 in group I and group II respectively. At 8 hours was 1.6 and 1 in group I and group II respectively. At 1 hour and 3 hours, difference was significant ($P < 0.05$).

Jain S *et al.* [10] conducted a study in which patients were divided into two groups to received 20 ml of normal saline intraperitoneally (group 1) or 20 ml of 0.5% bupivacaine with 1:200,000 adrenaline that The VAS was significantly higher in group I compared to group 2 at 1st, 4th and 8th postoperative hours. Although the VRS was higher in group

I compared to group 2 at 1st, 4th and 8th postoperative hour the difference was statistically significant only at 1st and 4th postoperative hour ($P<0.05$). Shoulder pain was not present in any of the patients in both the groups. The total number of patients requiring analgesics was higher for group I than group 2 ($P<0.05$).

Conclusion

Authors found that administration of intraperitoneal bupivacaine is a simple and effective method for postoperative pain relief after laparoscopic cholecystectomy.

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