Post-Operative Pain Relief After Operative Gynecological Laparoscopic Procedures With Intraperitoneal Bupivacaine

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Citation

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Abstract

Laparoscopic operative procedures have revolutionized gynecological surgery. These have several advantages: a smaller and more cosmetic incision, reduced blood loss and shorter post-operative stay which cuts down on hospital costs. However, postoperative pain continues to be one complication which results in an unpleasant experience for the patient, and at times causing a delayed discharge. Many of these patients require high doses of analgesics and may even need opioids to relieve this pain. Local anesthetics including Bupivacaine & Ropivacaine have been infiltrated at peri-incisional and/or periportal sites to relieve pain after laparoscopic cholecystectomy and laparoscopic hernia repair (1, 2). Since then many studies have been conducted to determine pain relief in patients after laparoscopic gynecological surgery. This study was Bupivacaine in relieving pain after operative gynecologic surgery.

INTRODUCTION

Laparoscopic operative procedures have revolutionized gynecological surgery. These have several advantages: a smaller and more cosmetic incision, reduced blood loss and shorter post-operative stay which cuts down on hospital costs. However, postoperative pain continues to be one complication which results in an unpleasant experience for the patient, and at times causing a delayed discharge. Many of these patients require high doses of analgesics and may even need opioids to relieve this pain. Local anesthetics including Bupivacaine & Ropivacaine have been infiltrated at peri-incisional and/or periportal sites to relieve pain after laparoscopic cholecystectomy and laparoscopic hernia repair ($_1$, $_2$). Since then many studies have been conducted to determine pain relief in patients after laparoscopic gynecological surgery. This study was Bupivacaine in relieving pain after operative gynecologic surgery.

MATERIALS AND METHODS

This was a prospective, randomized double blind, placebo controlled trial conducted on women undergoing laparoscopic gynecologic surgery under one academic unit of the department.

After seeking ethical clearance from the Ethics Committee, an informed consent was obtained from all patients. All patients between the age of 24 to 38 years scheduled for operative laparoscopy and classified as ASA status I or II were eligible. Patients undergoing diagnostic laparoscopy, sterilization or LUNA were excluded. Women with allergies to NSAIDS / Bupivacaine, those with chronic pain syndromes, where pain evaluation was judged unreliable because of neurological disease or treatment with steroids/NSAIDs/opioids prior to surgery were excluded.

All patients were given standard general anesthesia (propofol 2mg/kg, fentanyl 1mg/kg, muscle relaxant at induction, ventilation to normocapnia with N_2O and isoflurane in Oxygen via standard laryngeal mask airway. Residual and neuromuscular block was antagonized with neostigmine 2.5mg with glycopyrrolate 500 ugm). Either 50mg of Bupivacaine as 0.125% solution (10ml in 30ml saline) or 30ml of Saline was instilled intraperitoneally at the end of procedure. Patients were randomized to either group by computer generated random selected list. In the postoperative period visual analogue scores (VAS O - no pain to 10 - worst pain) were recorded at waking 2, 4, 6 and 8 hours. Time and dosage of analgesia given was recorded. The individual recording observations was blinded to the use of Bupivacaine or saline. Other side effects including shoulder tip pain, nausea, vomiting were also recorded. Suitability to discharge was assessed as per our unit's day case surgery guidelines and the total duration was recorded in both groups.

ANALYSIS OF RESULTS

Descriptive statistics i.e. mean, median, range and distribution with their percentage were described for the variable included in the study. To see significant difference for pain scores (VAS) between both groups of each point Wilcoxan Rankson test (Mann-Whitney U test) was applied. To see proportion of analgesic use and duration of hospital stay between the two groups, Chi-square test and student's test were used. A p value of 0.05 has been considered as level of statistical significance. Strata 8.0 statistical package was used for analysis.

RESULTS

The demographic profile of patients in both groups is described in Table 1.

Figure 1

Table 1: Demographic data of patients in two groups

	Group A (Bupivacaine)	Group B (Saline)
Age (years)	31.1 (5.6)	32.8 (7.1)
Weight (kg)	63.4 (9.5)	64.7 (10.9)

Both group of patients were comparable in the operative procedures performed (Table 2).

Figure 2

Table 2: Operative procedures of the patients in two groups

Procedure	Group A(Bupivacaine)	Group B(Saline)
Ovarian drilling	4	3
Adhesiolysis	10	7
Ovarian Cystectomy	3	3
Ovariotomy	1	1
Ovarian/cyst aspiration + fulguration of endometrioma	4	-
Salpingectomy	1	4
Fulgration of endometriosis	2	8

VAS (pain scores) were significantly less at 2 and 4 hours in women who received bupivacaine in comparison to those who received saline. However VAS was not different at 6 and 8 hrs after surgery (Table 3)

Figure 3

Table 3: VAS (Pain Scores) at 2, 4, 6 and 8 hours

		Mean VAS		
	2 hr (range)	4 hr (range)	6 hr (range)	8 hr (range)
Group A (Bupivacaine)	2 (0-6)	2 (0-5)	3 (0-6)	4 (0-7)
Group B (saline)	6 (3-9)	4 (3-8)	3 (1-6)	5 (1-7)
P value	<0.0001	<0.0001	0.63	0.71

The side effects including nausea, vomiting, shoulder tip, observed were comparable in both groups. However, analgesic requirement was significantly lesser in women receiving bupivacaine (Table 4). The mean hospital stay was similar in both groups.

Figure 4

Table 4: Side effects, analgesia requirement and hospital stay

	Group A(Bupivacaine)	Group B(Saline)	P Value
Nausea	5	5	NS
Vomiting	-	2	NS
Shoulder tip pain	-	2	NS
Need for analgesia	4	17	0.006
Hospital stay	11.4+11.5	10.7+9.6	NS

DISCUSSION

Postoperative pain is the main factor delaying discharge of patients undergoing day-care procedures including laparoscopy and hence adding to hospital cost. When searching for an optimum regime of pain relief in the postoperative period many analgesics have been investigated. Of these, local anesthetic (LA) agents offer theoretical and practical advantages for day case surgery. Depending on the route of administration, LA can have an analgesic effect lasting few hours. They have minimal sedative effects that can expedite the discharge of the patient. Local agents can have an opioid sparing effects thus reducing the nausea and vomiting commonly encountered after general anaethesia (GA). In this way they may enable the patient to reach the criteria for early discharge from hospital.

The use of local anesthetics directly instilled into the peritoneal cavity in l laparoscopic hernia repair procedures and after cholecystectomy has been shown to reduce pain in the postoperative period. ([1],[2],[3]) Chundrigar et al ([1]) report a decrease of postoperative pain 1-2 hours after laparoscopic cholecystectomy if 0.25% bupivacaine was used. However, analgesic consumption over 1st 24 hour was same in control study. Similar effects were noted by others after laparoscopic cholecystectomy with bupivacaine in different doses. ([2], [3])

In gynecology, decreased postoperative pain scores after local anesthetic administration have been reported in several studies ([4], [5], [6], [7]). However, the mode of administration lacks standardization e.g. infiltration on trajectory of trocars, infiltration of tubes or peritoneal instillation. Narchi et al ([4]) showed that intraperitoneal instillation of 100 mg bupivacaine did not cause toxicity. This technique is safe and with good pain relief in initial few hours. Goldstein et al ([5]) compared 100mg bupivacaine, 150mg Ropivacaine with saline as placebo. Pain score and analgesic requirement were

lesser with Ropivacaine as compared to Bupivacaine. Most studies also demonstrate that the effect of bupivacaine is short lasting (up to 6 hours). This was the observation in our study also. This is explainable on the pharmacokinetics of the drug. Recent studies including those by Ozer et al ([7]) also highlight the same.

However, the results of some studies have been conflicting as some researchers have found no pain benefit of instilling local anaesthetics into the peritoneal cavity. ([8], [9])

In conclusion intraperitoneal Bupivacaine may be a good option to relieve immediate postoperative pain, reducing analgesic doses in women after laparoscopic surgery. A systemic instillation is likely to be cost-effective because it decreases resource utilization on ward for treatment of postoperative pain and emesis. Also it is free of side effects like gastritis due to NSAIDs and fear of drug dependence as in morphine derivatives.

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