



Port Site Infiltration of Bupivacaine vs Conventional Analgesics in Controlling Postoperative Pain in Laparoscopic Surgeries - A Comparative Study

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Introduction

Laparoscopic surgery is associated with less pain than open surgeries, still it is no pain-free in the early post-operative period. Post-operative pain varies in nature, severity, and duration and is one of the main factors that delays patient discharge thus increasing the cost of surgery and family crisis.

Administration of narcotics and NSAIDs are the conventional pain control methods which can control the pain effectively, but causes Respiratory depression, drowsiness & sedation, nausea & vomiting, ileus & constipation. Joint commission on Accreditation of Health Organizations states excessive use of opioids and NSAIDs in the post op period leads to dissatisfaction of patients. Hence the usage of non-conventional techniques as an adjuvant to reduce the side effects of conventional agents.

This study is aimed to compare the efficacy and side effects of using conventional analgesics (opioid, NSAID's) vs. infiltration of local anesthetic agents in port site for post-operative pain control in laparoscopic surgery.

Methods

Study Design

This study was Prospective, Randomized, Controlled study conducted between July 2018 to July 2020

Aim

To study the analgesic effect of infiltration of bupivacaine at port site and compare its efficacy and side effects with conventional analgesics in laparoscopic surgeries and to assess the need for rescue analgesics in the early post-operative period in either groups.

Sample Size and Randomization

This study includes 100 patients. It is a prospective study among patients scheduled for laparoscopic surgery in Siva hospital between July 2018 to June 2020.

Patients were divided randomly into 2 groups, containing 50 patients each. Randomization was done in consecutive manner i.e. first candidate will be allocated to Bupivacaine while the second patient was allocated conventional analgesia.

Duration of Study: 2 years

Inclusion Criteria

- Uncomplicated cholelithiasis¹⁶
- sub acute appendix
- lap ventral hernia
- lap Inguinal hernia
- Age >12 years < 60years
- ASA I and II

Exclusion Criteria

- ASA III or more
- Allergy to NSAID or local anesthetics
- Age <12 years and >60 years
- Pregnancy
- Previous abdominal surgery
- Open conversion
- Inability to understand VAS scale

Anesthesia

A balanced general anaesthesia was given to all the patients with a prescribed dose of Inj.Glycopyrrolate + Inj. Midazolam + Inj.Propafol + Inj.Atracurium. Anesthesia was continued with O₂, N₂O, Isoflurane, and Inj. Atracurium. All patients were given inj. Ranitidine and inj.ondansetron as antiemetics. patients were monitored with Heart rate, Respiratory rate, continuous ECG, NIBP, SpO₂, and ETCO₂.

Surgical Technique

All surgeries were done in the department of general surgery, SIVA hospital. 3 ports for laparoscopic appendectomy and 4 for laparoscopic cholecystectomy¹ were used. Peritoneal access was established using veress needle. insufflation pressure of 12-15mm Hg was used throughout the operation.

Post-Operative Pain Assessment

Data's were entered into a proforma which included sex, the weight and duration of surgery. Postoperative pain was assessed with VAS (Visual Analogue scale). The primary analysis of post operative pain intensity got accessed via VAS

score at 1,4,8 and 12 hrs. following surgery.

VAS score was explained pre-operatively to the patient.

0-No pain

1-3- Mild pain

4-7- Moderate pain

8-10- Intense pain

The intensity of pain was graded in 10 points using VAS score at 1,4,8 and 12th hour postoperatively. The secondary analysis of rescue analgesia requirement and side effects of opioids was done. Injection ketorolac 30mg IV was given as rescue analgesia when required within twelve hours.

The data collected was entered into Microsoft Excel sheet. The categorical datas were recorded in percentage. The continues datas were recorded in mean \pm SD. Unpaired t- test was applied between the two groups for comparison. Then 'P' value of < 0.05 is statistically significant between both groups. Kruskal Wallis test was used to compare the categorical parameters in more than two groups.

Results

Uncomplicated GB stones, sub- acute appendix, hiatus hernia, ventral hernia repair and inguinal hernia repair patients were admitted for laparoscopic surgery. They got randomized in two groups (n=50 each). They were subjected to laparoscopic surgeries during this study period. Group-A received port site infiltration of bupivacaine and group-B received conventional analgesics.

There was no significant difference between either groups in terms of age, sex or weight of the patient, surgery duration in group A (66.78 \pm 18.41) and group B(67.5 \pm 19.53) which was not significant statistically (p+0.961) . Reduced visual analogue score was observed in group A compared to group B at 1,4,8 and 12 hrs. Which is significant with p value = 0.001. Consumption of rescue analgesics in the first 12 hrs. After surgery was also significantly less in group A (88% required nil, 18% demanded once,

24% twice) compared to group B in which (11%required no dose, 82% demanded once,80% required twice) with p-value = 0.001. Also the side effects were significantly lower in group A compared to group B (P= 0.036)

Table Showing P Value for Rescue Analgesic Requirement

RESCUE ANALGESICS REQUIRED	GROUP	
	A	B
NIL	42	5
ONE	7	34
TWO	1	11
P -VALUE - 0.001 SIGNIFICANT		
RESCUE ANALGESICS NEEDED	GROUP	
	A	B
YES	8	45
NO	42	5

Discussion

Nowadays laparoscopic procedures are practiced as daycare procedure, hence adequate pain relief is of immense importance allowing the patients to be discharged on the same day. In laparoscopic surgery arises from three major sources namely: 50-70% arising from incision site (somatic pain), 20-30% caused by pneumoperitoneum (referred pain) and 10-20 % from the surgical site (visceral pain)

Hence multimodal analgesia is the best way to reduce the postoperative pain. NSAID’s and Narcotics are being used in the postoperative pain relief since long time. But the opioids have their own side effects namely: confusion & respiratory depression, nausea & vomiting. NSAID’s can also cause both analgesic and unwanted side effects. Though, it has the additional benefit as it does not cause nausea and vomiting like opioids do. Any modality that has the capacity of pain control without any severe side effects shall be considered more practical and safer than conventional analgesics. This study is about infiltration of local anesthetic agents into the port site after laparoscopic surgery. A study by Cantore et al stated that somatic pain is more severe than visceral pain during the early postoperative period. This current study is mainly focused into

incision site pain (somatic pain) and benefits of local anesthetics.

Local anesthetics when used properly can have reduced need for narcotics and NSAID’s and hence their side effects too. They do not produce any sedative effect and hence patient can be ambulated earlier compared to other group. Patient get discharged early and thus reducing the hospital stay helping in cost effectiveness. This study shows that infiltration of bupivacaine into the port sites has reduced the intensity of pain in the early postoperative period compared to conventional group. It also reduced the need of narcotics during the postoperative period and hence their adverse effects. There was no adverse effects like cardiovascular effects, perioral numbness, eye nystagmus, fasciculation noted in any of the patients who received bupivacaine.

This study compared two groups - Group A received bupivacaine infiltration into port site and group B received intravenous tramadol immediately after surgery. VAS was used in assessing the intensity of pain at 1, 4.8 and 12 hrs. Post-surgery. The number of patients who had moderate to severe pain in early postoperative period was higher in group B when compared to bupivacaine group. The number of patients who had no pain were less in group B but most of the patients were painless in the early 12 hrs. Post-surgery in group A. Inj. ketorolac requirement was higher in group B which was significantly different from bupivacaine group and hence side effects were also less in bupivacaine group.

In a study in Italy, Cantore and et al stated pre- incision local infiltration with bupivacaine reduced the pain in early post-operative period and also reduced the rescue analgesic usage after laparoscopic cholecystectomy. Johnson et al have performed two consecutive studies using intra-peritoneal bupivacaine and periportal injection of bupivacaine after surgery which results showed that intraperitoneal instillation of bupivacaine had similar efficacy as efficient as port site infiltration.

Conclusion

Infiltration of local anesthetic agents at the port sites at the end of laparoscopic surgeries not only controlled the intensity of pain effectively in the early postop period but also helped in decreasing the need for narcotics and NSAIDs. They are hence recommended for all the post- operative period in all laparoscopic surgeries without any limitations. Patients feel satisfactory because of the decreased narcotic side effects. This study concludes that infiltration of bupivacaine at the laparoscopic port sites at the end of the surgery during port withdrawal, can achieve effective results in post-operative pain reduction.

Bibliography

1. Soler Company E1, FausSoler M, Morales Olivas F, Martínez-Pons Navarro V. Factors affecting postoperative pain. Rev EspAnesthesiolReanim.2001;48(4):163-70.
2. Cunningham FG, MacDonald PC. 21st ed. New York: McGraw-Hill.2001:362-558.
3. Carolyn Middleton, Understanding the physiological effects of unrelieved pain. Nurse Times.2003;99(37):28-31.
4. Møiniche S Henrik MD. Local Anesthetic Infiltration for Postoperative Pain Relief after Laparoscopy- Regional Anesthesia and Pain Medicine.2000;90(4):899-912.