



CODEN [USA]: IAJPBB

ISSN : 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187

<http://doi.org/10.5281/zenodo.4413773>
Available online at: <http://www.iajps.com>

Research Article

A COMPARATIVE STUDY OF INJ. KETOROLAC ALONG WITH INFILTRATION OF INJ. BUPIVACAINE AT OPERATION SITE & INJ. KETOROLAC ALONG WITH INTRA-PERITONEAL INFILTRATION OF INJ. BUPIVACAINE FOR PAIN RELIEF AFTER POST LAPAROSCOPIC CHOLECYSTECTOMY

¹Dr Maham Shahbaz, ²Dr Rabeea Sattar, ³Dr Hina Khan

¹Fatima Jinnah Medical University/Sir Ganga Ram Hospital Lahore

²Altibri Medical College, Karachi

³Fatima Jinnah Medical University/Sir Ganga Ram Hospital Lahore

Article Received November 2020

Accepted: December 2020

Published: January 2021

Abstract:

Aim: To study the analgesic effect of injection Ketorolac along with Intra-incisional infiltration of injection Bupivacaine & compare it with the analgesic effect of injection Ketorolac along with Intra-peritoneal infiltration of injection Bupivacaine.

Place and Duration: At the Surgical Unit-II and Anesthesia Unit-I of Sir Ganga Ram Hospital, Lahore for one-year duration from June 2019 to June 2020.

Patients and Methods: This was a prospective, randomized, double-blind study in 120 patients undergoing laparoscopic (LC) cholecystectomy, divided into 2 groups of 60 patients each. Group B received a 30 ml intraperitoneal injection of 0.25% bupivacaine along with an injection of Ketorolac 30 mg intravenously, and group A received a 30 mg injection of Ketorolac intravenously along with a local infiltration injection of 0.25% bupivacaine, 5 ml each in all 4 ports at the end of surgery. Postoperative; the investigator, who was unaware of the procedure, rated the pain with a visual analog scale (VAS) at 1, 6, 12 and 24 hours after surgery. Injection Nalbuphine 5 mg was administered intravenously as rescue pain reliever at the patient's request during the first 24 hours.

Results: The VAS results of the 2 groups show that group B has less results compared to group A, although it was statistically insignificant ($p > 0.05$). Also, the need for emergency analgesic treatment was significantly lower in group B compared to group A ($p < 0.00$).

Conclusion: At the end of the study, we concluded that the intraperitoneal infiltration of bupivacaine together with the injection of Ketorolac is more effective in reducing pain after LC.

Key words: Ketorolac injection, laparoscopic pain after cholecystectomy, intraperitoneal and operative Bupivacaine infusion

Corresponding author:**Dr. Maham Shahbaz,**

Fatima Jinnah Medical University/Sir Ganga Ram Hospital Lahore

QR code



Please cite this article in press Maham Shahbaz et al, A comparative study of inj. Ketorolac along with infiltration of inj. Bupivacaine at operation site & inj. Ketorolac along with intra-peritoneal infiltration of inj. Bupivacaine for pain relief after post laparoscopic cholecystectomy., Indo Am. J. P. Sci, 2021; 08(01).

INTRODUCTION:

Laparoscopic cholecystectomy (LC) is the standard technique for gallbladder removal for cholelithiasis and other diseases because it is associated with reduced surgical trauma and therefore reduced morbidity. Nevertheless, postoperative complications arise that delay the patient's return to normal activities, such as nausea and vomiting, pain, weakness and fatigue, among other complications. Appropriate treatment of these complications will accelerate patients' recovery and shorten their hospital stay. Opioids and non-steroidal anti-inflammatory drugs (NSAIDs) are the cornerstone of postoperative pain management after laparoscopic cholecystectomy. There is great variety in the choice, timing, route of administration, and dosages of different drugs. The clinical value of infiltration of the wound with local anesthetics (LA) has not been established. Moreover, with regard to the peritoneal use of local anesthetics, the choice of local anesthetics and their dosing is still controversial as many studies have been conducted on the subject with different agents and different dosages. Post-operative pain is variable in duration and nature and is one of the major factors delaying the discharge of patients who have undergone day care procedures, thereby increasing hospital costs and family discomfort. Even when the same procedure is performed, post-laparoscopic pain varies in quality, severity, and location, and is reported by different patients as an incision, intra-abdominal or directed to the tip of the shoulder. The etiology is multifactorial, including abdominal wall damage, visceral injury, inflammation, and peritoneal irritation from capno-peritoneum. Wound infection with local anesthetics (LA) to relieve post-operative pain is now routine practice in many surgical procedures. Wound infection is beneficial in open abdominal surgery after minor surgeries such as hernia repair; however, it proved to be less favorable for medium and large procedures. As laparoscopic surgery is a minimally invasive technique and is associated with the reduction of post-operative injuries, infection of a wound with local anesthetics (LA) after laparoscopic surgery can provide clinically significant relief from postoperative pain in the immediate postoperative period. The analgesic effect of local anesthetics lasts for several hours. These agents have a slight sedative effect which may speed up discharge from hospital. Local anesthetics can reduce opioid use, thus reducing the incidence of nausea and vomiting after general anesthesia (GA). It may also help you meet your discharge criteria early. Intraperitoneal administration of LA during surgery is used by many physicians to reduce postoperative pain. This technique was first used in LC in 1993. Since then.

Many clinical studies have been published worldwide to evaluate the efficacy of intraperitoneal LA infection in LC. The clinical value of LA infiltration of wounds and their intraperitoneal administration remains controversial.

MATERIAL AND METHODS:

This was a randomized, double-blind, prospective study conducted in 120 patients undergoing laparoscopic cholecystectomy at the Surgical Unit-II and Anesthesia Unit-I of Sir Ganga Ram Hospital, Lahore for one-year duration from June 2019 to June 2020. 120 patients, ASA II Grade II, scheduled for LC for gallstones, were included after approval by the hospital ethics committee and with informed written consent from patients. Patients with ASA III or higher, patients with acute cholecystitis, inability to understand and use the VAS scale, NSAID allergy or local anesthesia were excluded from the study. The patients were randomly divided into 2 groups, 60 patients each. Randomization was performed using the sealed envelope method. Group B received a 30 ml intraperitoneal injection of 0.25% Bupivacaine together with an intravenous Ketorolac 30 mg injection, while Group A received a 30 mg intravenous Ketorolac injection along with a local infiltration of 0.25% bupivacaine injection of 5 ml each in all 4 ports at the end of surgery. With intravenous access and the use of the mandatory monitors available, all 120 patients received general anesthesia in an identical standardized manner with the calculated dose of propofol injection, injection atracurium and 30 mg intravenous ketorolac. Anesthesia was maintained with oxygen, nitrous oxide, isoflurane and injectable supplemental doses of atracurium. After the gallbladder was removed and hemostasis was ensured, a 30 ml injection of 0.25% bupivacaine was intraperitoneally injected into patients in group B and a 20 ml injection of bupivacaine was infiltrated in all 4 ports with 5 ml in each port in group A of patients. Postoperatively, patients and investigators unfamiliar with the procedure rated pain using the VAS scale 1, 6, 12 and 24 hours postoperatively. Injection Nalbuphine 5 mg was administered intravenously as rescue pain reliever at the patient's request during the first 24 hours. The duration of the operation was also recorded for each patient. Before the operation, the patient was informed about the VAS 0-10 result.

- 0 - No pain
- 1 - 3 mild pain
- 4 - 7 moderate pain
- 8 - 10 Intense pain

Pain intensity was assessed by a 10-point VAS score at 1, 6, 12 and 24 hours after surgery. Nalbuin 5 mg emergency analgesic injection was administered

intravenously whenever a patient reported moderate or severe pain in the first 24 hours after surgery. Data analysis was performed using the statistical analysis program SPSS-17. Independent sample "t" test and chi-square test were used for comparison. Results are given as mean \pm SD. Then a p value of <0.05 was adopted as statistically significant between the 2 groups.

RESULTS:

There were no statistically significant differences between the two groups in terms of age, sex, and duration of surgery. The VAS scale was used to assess the pain intensity at 1, 6, 12 and 24 hours after surgery in both groups. The number of patients with mild, moderate and intense pain was greater in group A in all postoperative assessments compared to study group B. The need for emergency analgesia, which was administered with nalbuphine injection, was also greater in group A, which is significantly different from group B ($P = <0.00$), (table 3).

Table 1:

Parameters	Group A n= 60	Group B n= 60	p-value
Age (Yrs.)	23 – 60	24 – 65	0.547
Male: female	6:34	8:32	0.814
Duration of surgery (min.)	35 – 90	39 – 92	

Consumption of rescue pain medication in the first 24 hours after surgery was also significantly lower in group B (66.66% of patients requesting once, 25% twice, 8.33% three times and 26.66% did not ask for Nalbuphine within 24 hours) in compared to group A (where 100% of patients requested at least one injection of nalbuphine, 85% twice, and 20% three times) (Table 3).

Table 2: No. of patients with different VAS scores (no pain, mild, moderate and severe pain) after 1, 6, 12 and 24 hours after surgery.

Pain score (VAS)	Group A/ Group B				p-value
Intense (8-10)	30/8	12/04	6/02	10/00	0.085
Moderate (4-7)	18/4	24/10	16/4	14/00	0.039
Mild (1-3)	12/20	24/12	30/28	20/50	0.100
No pain (0)	00/28	00/34	8/26	16/10	0.162
Time after surgery (hours)	1	6	12	24	

Group A had a greater number of patients compared to Group B when patients with moderate to severe pain were assessed four times over 24 hours. The number of patients with mild pain was also smaller and the number of patients without pain was absent in Group A, but most patients were pain free in the early 12 hours after surgery in Group B.

Table 3: Rescue analgesic requirements in first 24 hours after surgery.

Rescue analgesic	Group A (%) n= 60	Group B (%) n=60	P value
Not required	00(00%)	16(26.66%)	0.00
Once	60(100%)	40(66.66%)	0.00
Twice	51(85%)	15(25%)	0.00
Thrice	12(20%)	05(8.33%)	0.00

DISCUSSION:

The etiology of pain after laparoscopic cholecystectomy is complex. Pain may appear at the incision sites (pain within the incision was somatic), in the gallbladder bed (which was visceral in origin) and as a result of obstruction of the peritoneal sac due to CO₂ injection. Therefore, multimodal analgesia is probably the best way to reduce post-operative pain. Multiple clinical studies have been conducted, and one study has shown that regular post-operative

administration of diclofenac in combination with pethidine as a rescue pain reliever is usually sufficient for post-operative post-LC analgesia. Only 30% of patients demanded pethidine and 45% of patients had a VAS score below 3.0 in the first 24 hours after surgery. Non-steroidal anti-inflammatory drugs (NSAIDs) are another class of painkillers with anti-inflammatory, analgesic, platelet-inhibiting and antipyretic properties. NSAIDs have been used for a long time in the treatment of operable and inoperable

pain syndromes. The mechanism of action of these drugs is that they non-specifically block the enzyme cyclooxygenase (COX), i.e. both isoforms (COX-1 and COX-2) are blocked. The COX-1 isoform is responsible for gastric protection and the function of platelets. On the other hand, the COX-2 isoform is an inducible pro-inflammatory isoform responsible mainly for the inflammation at the site of surgical trauma, which is responsible for post-operative pain. Therefore, NSAIDs can cause both an analgesic effect (which is desirable) and undesirable side effects. However, it has the added benefit of not causing the nausea and vomiting associated with opioids. Johnson et al. Conducted two further studies using intraperitoneal bupivacaine and injection of bupivacaine in the port area after surgery. The results showed that the intraperitoneal instillation of bupivacaine was similar in effectiveness to infiltration of the wound with bupivacaine and that the addition of NSAIDs did not reduce postoperative pain after laparoscopic cholecystectomy. Alexander P et al. In the article "The Effect of Intra-otoneal local Anesthesia in Laparoscopic Cholecystectomy: A Systematic Review and Meta-Analysis" concluded that the use of intraperitoneal local anesthetic instillation is safe and results in the reduction of early postoperative abdominal pain, which was statistically significant. No adverse events related to the toxicity of local anesthesia were reported. In their study, HernadezPalazon et al. Found that in patients undergoing laparoscopic cholecystectomy, 0.25% intraperitoneal administration of bupivacaine reduced the need for emergency analgesics in the first 6 hours after surgery compared to the control group. In our study, we found that 0.25% bupivacaine infiltration at port sites, beneath the right diaphragm and gallbladder placenta reduced postoperative pain in the first 24 hours. It also significantly reduces the need for painkillers in the postoperative period in the first 24 hours.

CONCLUSION:

This study found that the intraperitoneal infiltration of bupivacaine along with intravenous ketorolac is more effective in reducing pain after laparoscopic cholecystectomy compared to intravenous ketorolac with bupivacaine infiltration at the surgical site.

REFERENCES:

1. Vindal, Anubhav, Hitesh Sarada, and Pawanindra Lal. "Laparoscopically guided transversus abdominis plane block offers better pain relief after laparoscopic cholecystectomy: results of a triple blind randomized controlled trial." *Surgical Endoscopy* (2020): 1-9.
2. Wei, Xuan, and Xiaoxiao Yao. "The Impact of Intraperitoneal Levobupivacaine on Pain Relief After Laparoscopic Cholecystectomy: A Meta-analysis of Randomized Controlled Studies." *Surgical Laparoscopy, Endoscopy & Percutaneous Techniques* 30, no. 1 (2020): 1-6.
3. Lee, Sing-Ong, Li-Ping Huang, and Chih-Shung Wong. "Preoperative Administration of Extended-Release Dinalbuphine Sebacate Compares with Morphine for Post-Laparoscopic Cholecystectomy Pain Management: A Randomized Study." *Journal of Pain Research* 13 (2020): 2247.
4. Sözen, Kezban Koraş, and Neziha Karabulut. "Efficacy of Hand and Foot Massage in Anxiety and Pain Management Following Laparoscopic Cholecystectomy: A Controlled Randomized Study." *Surgical Laparoscopy, Endoscopy & Percutaneous Techniques* 30, no. 2 (2020): 111-116.
5. Ali, Wegdan A., Nagy S. Ali, Alaa M. Sewefy, and Aya H. Ahmed. "Comparative study between intraperitoneal bupivacaine and bupivacaine-nalbuphine for postoperative pain relief after laparoscopic cholecystectomy." *Research and Opinion in Anesthesia and Intensive Care* 7, no. 1 (2020): 57.
6. Manan, Abdul, Ashar Ahmad Khan, Irfan Ahmad, Muhammad Usman, Tariq Jamil, and Muhammad Afzal Sajid. "Intraperitoneal Bupivacaine as Post-laparoscopic Cholecystectomy Analgesia." *Journal of the College of Physicians and Surgeons Pakistan* 30, no. 1 (2020): 9-12.
7. Solanki, Nachiket A., Reshma R. Korat, Divyang V. Shah, and Subhash K. Patel. "Evaluation of Analgesic Efficacy of Bupivacaine and Ropivacaine Given Through Landmark Guided Erector Spinae Plane Block for Post-Operative Pain Relief in Patients Undergoing Laparoscopic Cholecystectomy."
8. Xu, William, Chris Varghese, Cameron I. Wells, Ian P. Bissett, and Gregory O'Grady. "Patient-Administered Transcutaneous Electrical Nerve Stimulation for Postoperative Pain Control After Laparoscopic Cholecystectomy: A Randomized, Sham-Controlled Feasibility Trial." *Neuromodulation: Technology at the Neural Interface* (2020).
9. Ekinci, Mursel, Bahadır Ciftci, Erkan Cem Celik, Emine Arzu Köse, Muhammet Ahmet Karakaya, and Yasar Ozdenkaya. "A randomized, placebo-controlled, double-blind study that evaluates efficacy of intravenous ibuprofen and acetaminophen for postoperative

- pain treatment following laparoscopic cholecystectomy surgery." *Journal of Gastrointestinal Surgery* 24, no. 4 (2020): 780-785.
10. Venkatraman, Rajagopalan, Ravi Saravanan, Meshach Dhas, and Anand Pushparani. "Comparison of laparoscopy-guided with ultrasound-guided subcostal transversus abdominis plane block in laparoscopic cholecystectomy—A prospective, randomised study." *Indian Journal of Anaesthesia* 64, no. 12 (2020): 1012.
 11. Suvarna, Rithin, D. V. Jeevan Kumar, and Vikas Neerajakshulu. "Bupivacaine irrigation of the gallbladder bed is effective in postoperative pain management after laparoscopic cholecystectomy."
 12. Salazar-Parra, Marcela, Bertha Georgina Guzman-Ramirez, Kevin Josue Pintor-Belmontes, Francisco José Barbosa-Camacho, Aldo Bernal-Hernández, Roberto Ulises Cruz-Neri, Clotilde Fuentes-Orozco et al. "Gender Differences in Postoperative Pain, Nausea and Vomiting After Elective Laparoscopic Cholecystectomy." *World Journal of Surgery* 44, no. 12 (2020): 4070-4076.
 13. Borges, Maraísa Rodrigues, Nuno Miguel Lopes de Oliveira, Izabella Barberato Silva Antonelli, Maristella Borges Silva, Eduardo Crema, and Luciane Fernanda Rodrigues Martinho Fernandes. "Transcutaneous electrical nerve stimulation is superior than placebo and control for postoperative pain relief." *Pain management* 10, no. 4 (2020): 235-246.
 14. Hamoda, Nashwa I., Hesham I. El Tatawy, Nagat S. El Shmaa, and Mohammad I. Okab. "Intraperitoneal Versus Ultrasound Guided Transversus Abdominis Plane Block by Bupivacaine-Magnesium Sulphate for Pain Relief after Laparoscopic Cholecystectomy." *Journal of Advances in Medicine and Medical Research* (2020): 81-90.
 15. Cianci, Pasquale, Nicola Tartaglia, Alberto Fersini, Cassano Dario, Petta Rocco, Menga Rosaria, Vincenzo Neri Full, and Antonio Ambrosi Full. "Pain control after laparoscopic cholecystectomy." (2020).