Original Article

Post-Operative Outcome of Open Cholecystectomy in Spinal versus General Anesthesia

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ABSTRACT

Objective: The purpose of this study is to compare the post-operative outcome of open cholecystectomy in spinal vs general anesthesia.

Study Design: Comparative/control randomized study

Place and Duration of Study: This study was conducted at the Surgery Department of Khairpur Medical College Hospital, Khairpur from January 2021 to June, 2021 for a period of six months.

Materials and Methods: One hundred and twenty patients of both genders were presented in this study. Patients were aged between 18-65 years. Patients who had ASA grade I and II and underwent open cholecystectomy were presented. Detailed demographics of enrolled cases including age, sex and body mass index were recorded after taking informed written consent. Patients were equally divided into two groups. Group I had 60 patients and received spinal anesthesia for open cholecystectomy and group II received general anesthesia in 60 patients. Post-operative VAS pain score, complications, effectiveness, hospital stay and patients' satisfaction were recorded and compared among both groups.

Results: There were 35 (58.3%) male patients and 25 (41.7%) females in group I with mean age 36.18±8.76 years while in group II 33 (55%) were males and 32 (45%) females with mean age 37.13±4.88 years. Mean BMI in group I was 24.09±7.24 kg/m^2 and in group II mean BMI was 25.04±4.44 kg/m$^{2.}$ Forty-eight (80%) cases in group I had ASA 1 and 45 (75%) patients in group II had ASA I. Mean operative time in group I was 40.03±3.61 minutes and in group II mean time was 44.07±6.18 minutes. Post- operative less pain score was observed among patients of group I 1.09±5.11 as compared to group II 3.07±4.13. Rate of complications nausea/vomiting, dizziness and hospital stay were significantly higher in group II. Recovery 48 (80%) and patients satisfaction 44 (73.3%) were higher among patients of group I as compared to group II 42 (70%) and 38 (63.3%).

Conclusion: The use of spinal anesthesia in open cholecystectomy was effective as compared to general anesthesia in terms of post-operative pain, complications and hospital stay.

Key Words: Open cholecystectomy, Spinal, General anesthesia, Complications

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INTRODUCTION

The gold standard for surgical therapy of symptomatic cholelithiasis was laparoscopic cholecystectomy (LC) Because of the procedure's minimally invasive nature, it's more likely to be given to patients who will have less postoperative pain, spend less time in the hospital, and return to work sooner.[1-3]

Surgery for LC is done under general anesthesia, (GA) and the procedure may cause nausea and vomiting as well as postoperative pain. In comparison to general anesthesia, spinal anesthesia was a less invasive anesthetic approach with reduced death and morbidity rates.[4] Laparoscopic surgery patients who had spinal anesthesia were more likely to be awake and have a better quality of life after the procedure, as well as to be able to walk around more quickly after the procedure.[5,6] Laparoscopic cholecystectomy is typically performed under GA and comes with the possibility of postoperative discomfort, nausea, and vomiting (nausea and vomiting) (PONV). Meta-analysis by Rodgers et al. found that using neuraxial methods for several surgical operations reduced mortality, vein thromboembolism and myocardial infarction among other problems.[7]A very safe anesthetic approach is spinal anesthesia (SA), which is widely utilized. In comparison to GA, SA has

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a number of advantages. They include being awake and oriented at the end of the treatment, reduced postoperative pain and the ability to ambulate earlier than patients who get general anesthetic. Selective spinal anesthesia also reduces the risk of nausea and vomiting compared to general anesthesia.[8] Surgery-associated neuroendocrine stress and unfavorable surgical reactions are better mitigated by SA than by GA. Patients having laparoscopic procedures benefit from selective spinal anesthesia, which reduces the risk of tooth and oral cavity damage during laryngoscopy, sore throat, and pain associated with intubation and/or extubation.[9] Several studies have examined whether SA may be used to treat LC in patients who are also candidates for GA.[10,11]

Regional anaesthetic hasn't acquired popularity or been consistently utilized as the exclusive type of anesthesia in laparoscopic surgeries, which is surprising in the era of minimally invasive medicine. As Johnson pointed out, "the difference between laparoscopic surgery and conventional surgery is likely to be modest because all laparoscopic treatments are essentially a change in access".[12] In order to prevent aspiration and respiratory distress due to the induction of carbon dioxide pneumoperitoneum, which is not well tolerated in a patient who is awake throughout the procedure, this statement is primarily founded on the notion that laparoscopy demands endotracheal intubation.[13].

MATERIALS AND METHODS

This comparative study was conducted at Surgery Department of Khairpur Medical College Hospital, Khairpur over a period of six months from 1st January 2021 to 30thJune 2021 and comprised 120 patients. Detailed demographics of enrolled cases were recorded after taking informed written consent. Patients with spinal deformity, back infection, bleeding disorders and those did not give any written consent were excluded.

Patients were aged between 18-65 years. Patients had ASA grade I and II underwent for open cholecystectomy were presented. Patients were equally divided into two groups. Group I had 60 patients and received spinal anesthesia for open cholecystectomy and group II received general anesthesia in 60 patients. Hyperbaric bupivacaine hydrochloride was injected intrathecally at the L3-L4 or L4-L5 intervertebral area under aseptic conditions into patients randomized to spinal anesthesia. To induce deep spinal anesthesia, the patient was placed in the trendelenburg position for three minutes. Propofol (2-3 mg/kg), fentanyl citrate (5 g/kg), and atracuriumbesylate (0.5 mg/kg) were used to induce anesthesia in patients who were randomly assigned to receive it. Using sevoflurane (1–2 percent) and propofol (2–4 mg/kg/h), the anesthesia was stabilized. During the procedure, all patients' hemodynamics was closely monitored. After surgery, 25 mg of neostigmine methyl sulfate and 1 mg of atropine sulfate were administered to combat any residual neuromuscular block.

Post-operative VAS pain score, complications, effectiveness, hospital stay and patient's satisfaction were recorded and compared among both groups. Complete data was analyzed by SPSS 26.0 version.

RESULTS

There were 35 (58.3%) male patients and 25 (41.7%) females in group I with mean age 36.18±8.76 years while in group II 33 (55%) were males and 32 (45%) females with mean age 37.13±4.88 years. Mean BMI in group I was 24.09±7.24 kg/m^2 and in group II mean BMI was 25.04±4.44 kg/m^2.Forty eight (80%) cases in group I had ASA 1 and 45 (75%) patients in group II had ASA I. Mean operative time in group I was 40.03±3.61 minutes and in group II mean time was 44.07±6.18 minutes (Table 1).

Post- operative after 8 hours less pain score was observed among patients of group I 1.09±5.11 as compared to group II 3.07±4.13 by using visual Analog score (Table 2). Rate of complications nausea/vomiting, dizziness and hospital stay were significantly higher in group II (Table 3). Recovery 48 (80%) and patients satisfaction 44 (73.3%) were higher among group I as compared to group II 42 (70%) and 38 (63.3%) [Table 4].

Table No.1: Baseline detailed demographics of enrolled cases

Variable	Group I	Group II
Mean age (years)	36.18±8.76	37.13±4.88
Mean BMI (kg/m^2)	24.09±7.24	25.04±4.44
Gender		
Male	35 (58.3%)	33 (55%)
Female	25 (41.7%)	32 (45%)
ASA		
I	50 (80%)	45 (75%)
II	12 (20%)	15 (25%)
Mean operative time (min)	40.03±3.61	44.07±6.18

Table No.2: Post-operative comparison of pain score among both groups by using VAS

Mean pain score (VAS)	Group I	Group II
After 2 hours	6.11±7.18	7.07±6.21
After 4 hours	3.11±7.05	5.24±6.07
After 8 hours	1.09±5.11	3.07±4.13

Table No.3: Frequency of complications

Variable	Group I	Group II
Hospital stay (days)	1.02±8.16	2.51±7.24
Complications		
Nausea/Vomiting	6 (10%)	8 (13.3%)
Dizziness	3 (5%)	5 (8.3%)
Pruritus	2 (2.5%)	2 (2.5%)
Urinary retention	1 (1.75%)	1 (1.75%)

Table No.4: Post-operative comparison of efficacy and satisfaction among both groups

Variable	Group I	Group II
Recovery		
Yes	48 (80%)	44 (73.3%)
No	12 (20%)	16 (26.7%)
Patients satisfaction		
Yes	42 (70%)	38 (63.3%)
No	18 (30%)	22 (36.7%)

DISCUSSION

Open cholecystectomy is commonly performed under general anesthesia because it helps to relax the patient's muscles enough for the procedure. However, it comes with a slew of risks, particularly if the patient has other health issues. Patients with bronchial asthma who undergo tracheal intubation run the risk of suffering life-threatening spasms, necessitating postoperative ventilation and thus an expensive hospital stay. Other risks that can be avoided in a regional anesthetic environment include oral and teeth harm during laryngoscopy, sore throat, and stomach inflation due to mask ventilation.[14]

There were 35 (58.3%) male patients and 25 (41.7%) females in group I with mean age 36.18±8.76 years while in group II 33 (55%) were males and 32 (45%) females with mean age 37.13 ±4.88 years. Mean BMI in group I was 24.09±7.24 kg/m^2 and in group II mean BMI was 25.04±4.44 kg/m^2. These findings were comparable to the previous studies.[15,16] 48 (80%) cases in group I had ASA 1 and 45 (75%) patients in group II had ASA I. Mean operative time in group I was 40.03±3.61 minutes and in group II mean time was 44.07±6.18 minutes. Pain following surgery is a universal phenomenon; it is often underestimated and undertreated. In open cholecystectomy, postoperative discomfort is critical because of the potential for respiratory complications. The first reason is that the open cholecystectomy incision is placed in such a way that it impairs the patient's respiratory movement, leading to a weak cough reflex and atelectasis or pneumonia as a result.[17] As a second point, intubation can cause edema and fluid exudation by traumatically altering the airway, but it can also introduce bacteria into the lower airway, increasing a patient's vulnerability to respiratory infections.

In this study we found that less pain score among patients of group I 1.09±5.11 as compared to group II 3.07±4.13 by using visual Analog score. This was comparable to previous studies in which spinal anesthesia was effective and superior.[18,19] Rate of complications nausea/vomiting, dizziness and hospital stay were significantly higher in group II. This is in line with the findings of Yousef[20], however Tzovaras[22] found no difference between our SA and GA groups in terms of early discharge and shortened length of hospital stay.

A meta-analysis by Yuet al[15] demonstrated that LC under SA was superior to LC under GA in postoperative pain within 12 h (visual analogue score (VAS) in 2–4 h, WMD = −1.61, P = 0.000; VAS in 6–8 h, WMD = −1.277, P = 0.015) and postoperative complications (postoperative nausea and vomiting (PONV) WMD = 0.427, P = 0.001; Overall Morbidity WMD = 0.691, P = 0.027).

Recovery 48 (80%) and patients satisfaction 44 (73.3%) were higher among group I as compared to group II 42 (70%) and 38 (63.3%).[22] Our findings thus far support the preliminary findings of our pilot study, which showed that spinal anesthetic can be used safely and effectively for this purpose. In addition, spinal anesthesia appears to be more successful than regular general anesthesia in controlling postoperative pain during the patient's hospital stay than the standard anesthesia. The recovery of patients after laparoscopic cholecystectomy under spinal anesthesia, on the other hand, was reported to be as excellent as the current standard anaesthetic procedure after discharge. Elective laparoscopic cholecystectomy in healthy individuals may soon benefit from spinal anesthesia as the gold standard anesthetic strategy, based on these early results. Spinal anesthesia is more successful than general anesthetic in reducing post-operative pain, analgesic demand, respiratory issues, and hospital stay for patients undergoing open cholecystectomy, not only because it is safer[23].

CONCLUSION

The use of spinal anesthesia in open cholecystectomy was effective as compared to general anesthesia in terms of post-operative pain, complications and hospital stay.

Author's Contribution:

Concept & Design of Study:	Zahoor Hussain
Drafting:	Anwar Ali Bozdar, Siraj-ud-Din
Data Analysis:	Abu Baker, Ghulam Ali Narejo, Aijaz Hussain Memon
Revisiting Critically:	Zahoor Hussain, Anwar Ali Bozdar
Final Approval of version:	Zahoor Hussain

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Bessa SS, Katri KM, Abdel-Salam WN, El-Kayal ESA, Tawfik TA. Spinal versus general anesthesia for day-case laparoscopic cholecystectomy: a prospective randomized study. J Laparoendoscopic Advanced Surg Tech 2012;22(6):550–55.

2. Lichten JB, Reid JJ, Zahalsky MP, Friedman RL. Laparoscopic cholecystectomy in the new millennium. Surg Endosc 2001;15(8):867–72.
3. Grace PA, Quereshi A, Coleman J, et al. Reduced postoperative hospitalization after laparoscopic cholecystectomy. Br J Surg 1991;78(2):160-62.
4. Bessa SS, El-Sayes IA, El-Saiedi MK, Abdel-Baki NK, Abdel-Maksoud MM. Laparoscopic cholecystectomy under spinal versus general anesthesia: a prospective, randomized study. J Laparoendoscopic Advanced Surg Tech 2010;20(6): 515-20.
5. Pursnani KG, Bazza Y, Calleja M, Mughal MM. Laparoscopic cholecystectomy under epidural anesthesia in patients with chronic respiratory disease. Surg Endoscop 1998;12(8):1082-4..
6. Lennox PH, Vaghadia H, Henderson C, Martin L, Mitchell GWE. Small-dose selective spinal anesthesia for short-duration outpatient laparoscopy: recovery characteristics compared with desflurane anesthesia. Anesthesia Analgesia 2002;94(2):346-50.
7. Rodgers A, Walker N, Schug S, McKee H, Van Zundert A, Dage D, et al. Reduction of postoperative mortality and morbidity with epidural or spinal anesthesia: results from an overview of randomised trials. BMJ 2000;321:1493–7.
8. Longo MA, Cavalheiro BT, de Oliveira Filho GR. Laparoscopic cholecystectomy under neuraxial anesthesia compared with general anesthesia: Systematic review and meta-analyses. J Clin Anesth 2017;41:48-54.
9. Hamad MA, Ibrahim El-Khattary OA. Laparoscopic cholecystectomy under spinal anesthesia with nitrous oxide pneumoperitoneum: A feasibility study. Surg Endosc 2003;17:1426–8.
10. Yuksek YN, Akat AZ, Gozalan U, Daglar G, Yasar Pala Y, Canturk M, et al. Laparoscopic cholecystectomy under spinal anesthesia. Am J Surg 2008;195:533–6.
11. Goyal S, Goyal S, Singla S. Laparoscopic cholecystectomy under spinal anesthesia with low-pressure pneumoperitoneum - prospective study of 150 cases. Arch Clin Exp Surg 2012;1(4):224–8.
12. Johnson A. Laparoscopic surgery. Lancet 1997; 349(9052):631-5.
13. Crabtree JH, Fishman A, Huen IT. Videolaparoscopic peritoneal dialysis catheter implant and rescue procedures under local anesthesia with nitrous oxide pneumoperitoneum. Adv Perit Dial 1998;14:83-6.
14. Sinha R, Gurwara AK, Gupta SC. Laparoscopic surgery using spinal anesthesia. JSLS 2008;12:133–8.
15. Yu G, Wen Q, Qiu L, et al. Laparoscopic cholecystectomy under spinal anaesthesiavs. general anaesthesia: a meta-analysis of randomized controlled trials. BMC Anesthesiol 2015;15:176.
16. Imbelloni LE, Fornasari M, Fialho JC, Sant'Anna R, Cordeiro JA. General anesthesia versus spinal anesthesia for laparoscopic cholecystectomy. Rev Bras Anestesiol 2010;60(3):217-27.
17. Kısa A, Koruk S, Kocoglu H, Leblebici M. Comparison of general anesthesia with spinal anesthesia in laparoscopic cholecystectomy operations. Medeniyet Med J 2019;34:346-53.
18. Kalaivani V, Pujari VS, Sreevathsa MR, Hiremath BV, Bevinaguddaiah Y. Laparoscopic cholecystectomy under spinal anaesthesia vs. general anaesthesia: a prospective randomised study. J Clin Diag Res 2014; 8(8): NC01-4.
19. Chiao F,Boretsky K. Laparoscopic surgery in infants under spinal anesthesia block: a case report of 3 cases. A&A Practice 2019; 12(5): 168-70.
20. Yousef GT, Lasheen AE. General anesthesia versus segmental thoracic or conventional lumbar spinal anesthesia for patients undergoing laparoscopic cholecystectomy. Anesth Essays Res 2012;6:167-73.
21. Tzovaras G, Fafoulakis F, Pratsas K, Georgopoulou S, Stamatiou G, Hatzitheofilou C. Spinal vs general anesthesia for laparoscopic cholecystectomy: interim analysis of a controlled randomized trial. Arch Surg 2008;143:497–501.
22. Khan N, Ashraf M, Dilruba H, Khan M. Spinal anesthesia versus general anesthesia for open cholecystectomy: spinal anesthesia versus general anesthesia for open cholecystectomy: comparison of postoperative course address for correspondence. Ann Sci 2019;9(2):95-8.
23. Cantore F, Boni L, Di Giuseppe M, Giavarini L, Rovera F, Dionigi G. Pre-incision local infiltration with levobupivacaine reduces pain and analgesic consumption after laparoscopic cholecystectomy: a new device for day-case procedure. Int J Surg 2008;6:S89-92.