Original Research

Comparative Evaluation of Postoperative Pain Relief following Spinal and General Anesthesia in Patients Undergoing Laparoscopic Cholecystectomy

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ABSTRACT

Background: Cholecystitis is a condition that typically requires surgical intervention, with laparoscopic cholecystectomy being the most common treatment approach. Effective management of post-operative pain is a critical aspect of the care provided to surgical patients. The present study was conducted for comparative evaluation of postoperative pain relief following spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy.

Materials &Methods: A total of 100 patients scheduled to undergo LC were enrolled.Complete demographic and clinical details of all the patients were obtained. Randomization was done of all the patients into two study groups with 50 patients in each group as follows: Group A: Patients undergoing LC under spinal anesthesia, and Group B: Patients undergoing LC under general anesthesia. Post-operative pain was assessed. Chi-square test and student t test was used for evaluation of level of significance. P-value < 0.05 was considered as significant.

Results: Mean age of the patients of group A and group B was 45.8 years and 42.9 years respectively. Significant results were obtained while comparing the pain at the end of the surgery among the patients of the two study groups. However; while comparing the postoperative pain 6 hours after the surgery among the two study groups, non-significant results were obtained.

Conclusion: In patients who have undergone laparoscopic cholecystectomy, spinal anesthesia is associated with superior postoperative analgesia during the recovery phase.

Key words: Spinal, General Anesthesia, Laparoscopic Cholecystectomy.

INTRODUCTION

Cholecystitis is a condition that typically requires surgical intervention, with laparoscopic cholecystectomy being the most common treatment approach. This surgical procedure is essential to prevent complications that may arise from the progression of cholecystitis and its associated pathological outcomes. There is ongoing debate concerning the appropriate use and timing of laparoscopic cholecystectomy in cases of both acute and chronic cholecystitis. Additionally, challenges may arise during the dissection of the gallbladder in both acute and chronic scenarios, potentially resulting in suboptimal outcomes.[1, 2]

Laparoscopic cholecystectomy was initially introduced by Muhe in 1986 and has since advanced to a stage where it has supplanted the open surgical technique in numerous medical facilities globally. Currently, laparoscopic cholecystectomy is regarded as the preferred method for managing gallstone disease, superseding the open approach.[3,4] The advantages associated with laparoscopic cholecystectomy, in contrast to the open technique, encompass a quicker resumption of bowel function, reduced post-operative discomfort, improved aesthetic outcomes, and a shorter duration of hospitalization. These factors contribute to comparable or lower overall hospital expenses, as evidenced by multiple randomized controlled trials.[5, 6]

Effective management of post-operative pain is a critical aspect of the care provided to surgical patients. Extensive research is currently being conducted in this area. Nevertheless, post-operative pain continues to pose significant challenges for both surgeons and anesthetists involved in pain management. Insufficiently managed pain can result in harmful physiological consequences, as well as negative psychological, economic, and social impacts. An increasing number of laparoscopic procedures are being conducted under spinal anesthesia (SA) with low-pressure pneumoperitoneum. Various regional anesthesia techniques, including epidural, combined spinal-epidural, spinal, and low thoracic epidural blocks, have been utilized for laparoscopic surgeries in patients with multiple comorbidities who are deemed unsuitable for general anesthesia (GA).[7, 8]Hence; the present study was conducted for comparative evaluation of postoperative pain relief following spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy.

MATERIALS & METHODS

A total of 100 patients scheduled to undergo LC were enrolled. Complete demographic and clinical details of all the patients were obtained. Randomization was done of all the patients into two study groups with 50 patients in each group as follows:

Group A: Patients undergoing LC under spinal anesthesia, and

Group B: Patients undergoing LC under general anesthesia

Baseline hemodynamic and biochemical profile was assessed in all the patients. Anesthesia was given according to respective study groups and LC was done. The evaluation of postoperative pain was conducted at the conclusion of the surgical procedure and again seven hours post-operation, utilizing the visual analogue scale (VAS). The categorization of pain severity according to the VAS was established as follows: no pain was indicated by a score of less than 2, mild pain was represented by scores ranging from 3 to 5, Moderate pain was denoted as 6 to 7 and severe pain was denoted by a score of 8 or higher. All data were documented in a Microsoft Excel spreadsheet and subsequently analyzed statistically using SPSS software. Chi-square test and student t test was used for evaluation of level of significance. P-value < 0.05 was considered as significant.

RESULTS

The mean age of the patients of group A and group B was 45.8 years and 42.9 years respectively. Majority proportion of patients of both the study groups were males. 64 percent of the patients of group A and 70 percent of the patients of Group B were rural residence. Among patients of group A, at the end of surgery, 28 percent, 28 percent, 24 percent and 20 percent of the patients had no pain, mild pain, moderate pain and severe pain respectively. Among patients of group B, at the end of surgery, 22 percent, 20 percent, 20 percent and 38 percent of the patients had no pain, mild pain, moderate pain and severe pain respectively. Significant results were obtained while comparing the pain at the end of the surgery among the patients of the two study groups. However; while comparing the postoperative pain 6 hours after the surgery among the two study groups, non-significant results were obtained.

Table 1: Demographic data

Variable	Group A		Group B	
	Number	Percentage	Number	Percentage
Mean age (years)	45.8		42.9	
Males	29	58	31	62
Females	21	42	19	38
Rural residence	32	64	35	70
Urban residence	18	36	15	30

Table 2: Comparison of pain at the end of surgery

Pain	Group A		Group B	
	Number	Percentage	Number	Percentage
No pain	14	28	11	22
Mild pain	14	28	10	20
Moderate pain	12	24	10	20
Severe pain	10	20	19	38
Total	50	100	50	100
p-value	0.004 (Significant)			

Table 3: Comparison of pain 6 hours post-surgery

Pain	Group A		Group B	
	Number	Percentage	Number	Percentage
No pain	24	48	22	44
Mild pain	12	24	10	20
Moderate pain	10	20	12	24
Severe pain	4	8	6	12
Total	50	100	50	100

DISCUSSION

Laparoscopic surgery, specifically pure laparoscopic surgery (PLS), has been increasingly utilized across various medical disciplines. In comparison to open surgery (OS), PLS offers significant benefits, including reduced blood loss, diminished postoperative pain, a lower incidence of complications, expedited resumption of dietary intake post-surgery, and shorter hospital stays. However, its adoption in hepatobiliary and pancreatic (HBP) surgery has been relatively gradual, primarily due to the inherent technical challenges and the extended learning curve associated with these procedures. An exception to this trend is laparoscopic cholecystectomy (LC) within the HBP surgical domain. LC is characterized by its lack of necessity for complex techniques such as reconstructions or anastomoses, which contributes to a more rapid learning curve for practitioners.[7-9] Hence; the present study was conducted for comparative evaluation of postoperative pain relief following spinal and general anesthesia in patients undergoing laparoscopic cholecystectomy.

The mean age of the patients of group A and group B was 45.8 years and 42.9 years respectively. Majority proportion of patients of both the study groups were males. 64 percent of the patients of group A and 70 percent of the patients of Group B were rural residence. Among patients of group A, at the end of surgery, 28 percent, 28 percent, 24 percent and 20 percent of the patients had no pain, mild pain, moderate pain and severe pain respectively. Among patients of group B, at the end of surgery, 22 percent, 20 percent, 20 percent and 38 percent of the patients had no pain, mild pain, moderate pain and severe pain respectively. Significant results were obtained while comparing the pain at the end of the surgery among the patients of the two study groups. However; while comparing the postoperative pain 6 hours after the surgery among the two study groups, non-significant results were obtained. Tiwari S et al conducted a study to assess the efficacy, safety, and cost-effectiveness of performing laparoscopic cholecystectomy under spinal anaesthesia (SA) compared to general anaesthesia (GA). Patients who met the inclusion criteria were randomly assigned to two groups. Group A received general anaesthesia, while Group B was administered spinal anaesthesia, both using standardized techniques. Among the 235 cases included in the study, 114 were analyzed in Group A and 110 in Group B. The mean duration of anaesthesia was longer in the GA group (49.45 minutes) compared to the SA group (40.64 minutes, P = 0.02). However, the time taken for pneumoperitoneum and the overall surgical duration were slightly extended in the SA group. Of the 117 cases that received SA, 27 experienced intraoperative events, with four cases requiring conversion to GA due to significant complications. No postoperative complications were observed in either group. Pain relief was notably better in the SA group during the immediate postoperative period (at 6 and 12 hours), but pain levels were comparable to those in the GA group by the time of discharge (24 hours). There were no late postoperative complications or readmissions reported in either group. The findings suggest that laparoscopic cholecystectomy performed under spinal anaesthesia can be a feasible and safe routine anaesthetic option.[10]Sharaf A et al conducted a study to find effective post-operative pain control is an essential component of care of surgical patients. Various analgesic regimens have been used to ensure adequate postoperative pin relief. We conducted this study to compare the efficacy of spinal anesthesia versus general anesthesia regarding post-operative pain following laparoscopic cholecystectomy. VAS was 6.94 (median = 7, mode = 8) in Group-A versus 6.23 ± 2.11 (median = 6, mode= 5) in Group-B, p value 0.0277. At six hours (S-6), 31(51.6%) patients no mild pain in Group-A, 24(40%) had mild pain and 5(8.3%) had severe pain. Whereas 30 (50%)patients had no pain, 8 (13.3%) patients had mild pain, and 22 (36.6%) patients had severe pain in Group-B. The p-value was 0.022, which is statistically significant. Single shot spinal anesthesia provides better postoperative analgesia in the postsurgical period. The addition of intrathecal fentanyl provides adequate analgesia, including relief from shoulder tip pain. So, spinal anesthesia can be safely used as sole anesthesia for laparoscopic cholecystectomy.[11]

CONCLUSION

Laparoscopic cholecystectomy patients who received spinal anesthesia experienced enhanced postoperative pain relief during the recovery period. This approach provided superior analgesia, reducing discomfort and promoting a smoother recovery. Spinal anesthesia's benefits in this context are notable, offering improved

pain management. This approach can significantly impact patient comfort and satisfaction.

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