



LAPAROSCOPIC CHOLECYSTECTOMY UNDER SPINAL ANAESTHESIA- IS IT SAFE AND FEASIBLE? CASE CONTROL STUDY

General Surgery

Dr Pradip Kumar Bazaz	MS, FAIS, FIAGES, Assistant Professor, Department of General Surgery, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar-812001.
Dr Sashi Kant Joshi*	MD (Anaesthesiology and Critical Care), Senior Resident, Department of Anaesthesia Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar-812001. *Corresponding Author
Dr Pravin Kumar	MS (Surgery), Senior Resident, Department of General Surgery, Jawaharlal Nehru Medical College and Hospital, Bhagalpur, Bihar-812001.

ABSTRACT

Background- Gall stone disease is very common in north eastern region of India, especially in our region of Bihar. Laparoscopic cholecystectomy is the main treatment of choice in this disease. LC can be done under GA or SA. This has been reported that spinal anaesthesia can be used as an alternative to GA for doing LC.

Aim- This study is aimed to evaluate efficacy, feasibility, safety and cost effectiveness of conducting LC under SA as compared to GA.

Materials And Methods- This study was done at Department of General Surgery, Jawaharlal Nehru Medical College and Hospital from April 2018 to February 2020. The study includes two groups: Group A and B. Group A patients received GA for LC and Group B patients received SA for LC. Both groups underwent 4 standard port (10mm x 2 and 5mm x 2) laparoscopic cholecystectomy. Intra operative events and post-operative pain outcomes were measured.

Results- There were 117 patients in total. Group A(GA) includes 59 and Group B(SA) included 58 patients. Out of 58 patients who received SA in Group B, 3(Three) experienced intra operative events which were significant enough to convert into GA. No post-operative specific complication noted in either groups. Pain relief was significantly more in Group B(SA) than Group A(GA) in immediate post-operative period (06-12 hrs), but same as Group A(GA) at the time of discharge which was 24-48 hrs. No late post op complications or re-admission in either groups.

Conclusion- LC under SA as a routine anaesthesia of choice is feasible and safe. SA can be recommended for day care procedure LC in developing countries like ours where cost factor is also a major factor in hospital setups.

KEYWORDS

General anaesthesia (GA), Laparoscopic Cholecystectomy(LC), Spinal Anaesthesia(SA)

INTRODUCTION

Relaxant general anaesthesia with endotracheal intubation is anaesthesia of choice for LC. Regional anaesthesia (spinal/epidural/combined) has been reported as a side technique for performing LC as an alternative to GA. Initially it was reported only for cases who had high risk co-morbidities for GA.¹⁻²

More recently it has been reported as a routine technique for otherwise healthy patients.^{3,4} It was thought that LC necessitates endotracheal intubation to prevent aspiration, abdominal discomfort and hypercarbia, which was expected secondary to induction of CO₂ pneumoperitoneum.⁵ Recent studies demonstrate that LC with low pressure CO₂ pneumoperitoneum can indeed be safely performed under spinal anaesthesia.⁶ LC under SA has not gained wide acceptance. We performed case controlled study to assess that whether SA can be used routinely instead of GA.

MATERIALS AND METHODS-

This study was done at Department of General Surgery, Jawaharlal Nehru Medical College and Hospital from April 2018 to February 2020. The study includes two groups. Group A and B. Group A patients received GA for LC and Group B patients received SA for LC. Both men and women in 18-70 years' age groups were involved. Both groups underwent 4 standard port (10mm x 2 and 5mm x 2) laparoscopic cholecystectomy. Intra operative events and post-operative pain outcomes were measured. Patients selection- Newly diagnosed case of cholelithiasis of different age group from 18-70 years' age group were evaluated in this study. Patients of acute inflammatory process (cholecystitis, pancreatitis or cholangitis), suspected or confirmed CBD stones, bleeding disorders, local spinal deformity, COPD cases and patients on steroids, valvular heart disease or severe IHD were excluded. History of previous open upper abdominal surgery were also excluded. Patients were randomised to undergo LC under SA and GA by a random number generator. The surgery was performed by the same surgeon team and anaesthetists for both study group patients.

Anaesthetic Management-

Pre-anaesthetic medication was standardised for all patients. Each patient received Inj Diclofenac Aqua 75mg IM/IV, Inj Pantoprazole IV and Inj Ondansetron 4mg IV. Pre-op HR, SPO₂, RR, BP, MAP (Mean

arterial pressure) were monitored.

1- In GA group, anaesthesia was induced with 2.5mg/kg of Propofol and 4 mg of Vecuronium. Maintenance of anaesthesia was done with O₂, N₂O and isoflurane. Residual neuromuscular blockade was antagonised with 2.5mg of neostigmine and 0.4mg glycopyrrolate at the end of surgery.

2- In SA Group, the patients were placed in sitting or left lateral decubitus position as comfortable. The subarachnoid space puncture with LP needle no 25/26 was performed between L₃-L₄ apophyses and 2.5-3.5 ml of hyperbaric (heavy) 0.5% Bupivacaine was injected. Afterwards patient was placed in supine position with head down position. After the surgeon confirmed the anaesthesia at T4 level by pin puncture "go ahead" was given. If Mean Arterial Pressure drops below 60mmHg, 3mg of Mephentramine was administered. During procedure anxiety was treated with 2mg Midazolam and pain with Tramadol 50mg IV bolus.

Surgical Technique- LC was performed according to the four port standard technique. Pneumoperitoneum was created with CO₂ at 10-12mmHg. Nasogastric tube was introduced only when surgeon desired decompression of stomach. Conversion from LC to open cholecystectomy was done in following situations.

- 1- Patient anxiety
- 2- Pain not reduced with medications
- 3- Bleeding which could not be controlled by routine manoeuvres.

Intra-operative monitoring of hemodynamic parameters was maintained for all the patients in both the groups with non-invasive multi parameter monitor.

Post-operative management- Post-operatively patients were maintained on IV fluids and iv tramadol. Inj pentazocin was supplemented as a second measure analgesics for persistent pain. Other post-operative events such as discomfort, nausea, vomiting, shoulder pain, urinary retention, headache or any other neurologic complaints were also recorded. The patients were randomly discharged to home the next day between 24-48 hours unless some complications warranted further stay.

RESULTS-**SA group-**

Level of anaesthesia was adequate in all to start LC. 14 cases required some intervention on anaesthesiologists part. Out of these 2 were significant enough for intubation and conversion to GA due to discomfort in abdomen, anxiety and nausea and vomiting. 1 case had to be converted to open cholecystectomy due to dense adhesions in calots triangle and haemorrhage. Therefore, out of 58, 55 cases randomised to receive SA, 3 had to be converted to GA.

Post-op events were noticed in 5/55 cases (9.1%). Urinary retention was relieved with catheterisation. Hypotension was treated with saline infusion, post Dural headache with pentazocin 30mg iv. Pain was treated with Tramadol IV/IM and IV Paracetamol as per need. The patients were discharged next day after 24-48hrs. The patients were followed up till sutures were removed 7-10 days later. No late post-operative complications noted.

GA group-

Among 59 cases who received GA, 2 cases had to be converted to open cholecystectomy because of haemorrhage and dense adhesions in calots triangle. Post-operative events were noticed in 12/57 cases (21.1%). Most common complain was pain abdomen 6/57 (10.5%). All patients received Inj Pentazocin 30mg IV in addition to Inj Tramadol. Inj ondansetron for nausea and vomiting. The pain was less in SA group in immediate post-operative period but was similar to the other group at the time of discharge.

Similar to SA group, all patients were discharged after 24-48 hours. There were no late complications or re-admission in either groups.

DISCUSSION-

Though regional anaesthesia for the LC has been shown to be safe and associated with better post-operative pain control in immediate post-op period, it has not become the anaesthesia of choice. There may be multiple reasons for this. It is assumed that pneumoperitoneum induces rise in intra-abdominal pressure which may result in regurgitation of gastric contents, use of endotracheal intubation prevents aspiration in such events. Secondly due to increased intra-abdominal pressure during pneumo together with head up tilt position used for LC decreases venous return to heart. SA induces peripheral vasodilation hence during LC under SA there is fear of hypotension. Post effects of CO₂ pneumo on intra-operative hemodynamics under SA is not a well-studied scenario. We used liberal pre-anaesthetic hydration in SA group to prevent hypotension. Sinha et al⁴ noted on incidence of hypotension as 20.5% in their series. We did have hypotension in 3 out of 55 cases (5.5%) which was corrected with saline infusion and selective alpha blocker agent Inj Mephentramine IV. In one case due to nausea and vomiting was severe and hence immediate intubation was done. In our series we notice that SPO₂ remained within normal limit in SA group.

Overall 2 out of 57 cases (3.5%) of LC under SA were converted to GA due to non-surgical cause i.e. due to discomfort, anxiety, nausea, and/or vomiting. This is similar to experience of other authors too where incidence of conversion from SA to GA was in range nil to 2.8%.^{3,4,6}

The post-operative recovery of patients was normal in all patients of both the groups. Surgical procedure related pain was reported significantly less in SA group as compared to GA group possibly due to sensory blockage which persists for some time in immediate post-operative period. The patients in SA group seemed to have lesser pain in immediate post-operative period but by the time of discharge, discomfort was same in both the groups. Bessa et al⁸ in a similar study have shown to confirm that LC under SA felt pain significantly less in early post-op period as compared to that performed under GA.

Although the present study does not provide a large sample size, this study supports the feasibility and safety of SA to conduct elective LC. The patient's outcomes are similar to that observed if LC is done under GA. This study did not include cost analysis, but other studies²⁻⁵ indicates that LC under SA is more cost effective than under GA. LC under SA is a very satisfactory option as anaesthesia of choice especially in developing countries.

CONCLUSION

LC done under SA as a routine anaesthesia of choice is feasible and

safe. This can be recommended as anaesthesia of choice for conducting elective LC in hospital setups in developing countries where cost factor is a major factor.

REFERENCES

- 1- Pursnani KG, Bazza Y, Callaja M, Mughal MM. Lap cholecystectomy under epidural anaesthesia in patients with chronic respiratory disease. *Surg Endosc* (1998;12:1082-4)
- 2- Gramatica L Jr, Brasesca OE, Luna MA, Martinesi V, Panebianco G, Labeque F et al. Lap cholecystectomy performed under regional anaesthesia in patients with obstructive pulmonary disease. *Surg Endosc* (2002;16:472-5)
- 3- Tzovares G, Fafoulakis F, Pratsas K, Georgopoulou S, Stamatiou G, Hatzitheo filou C. Lap cholecystectomy under spinal anaesthesia: A pilot study. *Surg Endosc* (2006;20:580-2)
- 4- Sinha R, Gurwara AK, Gupta SC. Lap cholecystectomy under spinal anaesthesia: A study of 3492 patients. *J Laparo-Endosc Adv Surg Tech A* (2009;19:323-7)
- 5- Sharp JR, Pierson, Brady CE. Comparison of CO₂ and N₂O induced discomfort during peritoneoscopy under local anaesthesia. *Gastroenterology* (1982;82:453-6)
- 6- Gautam B. Spinal anaesthesia for lap cholecystectomy : A feasibility and safety study. *Kathmandu Univ Med J* (2009;7:360-8)
- 7- Feiteha MS, Curet MJ. Lap cholecystectomy. In Zuker KA, editor, *Surgical Laparoscopy* Lippincott Williams and Wilkins; (2001.p.122-7)
- 8- Bessa SS, El Sayes IA, El-Saiedi MK, Abdul-Baki MA, Abdul-Maksood MM. Laparoscopic cholecystectomy under spinal versus general anaesthesia: A prospective randomised study *J Laparo-Endosc Adv Surg Tech A* (2010;20:515-20)
- 9- Liu X, Weic, Wang Z, Wang H. Different anaesthesia methods for lap cholecystectomy. *Anaesthesia* (2011;60:723-8)