



Original Article

Spinal Anaesthesia Vs General Anaesthesia for Open Cholecystectomy Operation Interim Analysis of a Controlled Randomized Trial

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Abstract

This is a prospective randomized clinical study was done in different clinics in Rajshahi city from September 2011 to September, 2012 to evaluate the outcome of patient undergoing cholecystectomy operation by spinal Anaesthesia. This is also a comparative study of patient undergoing cholecystectomy operation either by spinal Anaesthesia or by general Anaesthesia. For this study 100 patient of open cholecystectomy were randomly selected in to two groups (Each group contain 50 patients). Group A patient received spinal Anaesthesia with some sorts of IV anaesthetic drugs such as low dose ketamine with atropine or low dose Opioids if necessary before surgical incision. Group B patients received general Anaesthesia as usual procedure. Then these patient were monitored during per-operative and postoperative period to evaluate its outcome. After completion of the operation we seen that those patient received spinal Anaesthesia had better outcome then general Anaesthesia undergoing open cholecystectomy operation.

TAJ 2011; 24(1): 30-33

Introduction

Previously general anaesthesia was the only anaesthetic procedure for open cholecystectomy operation. Now -a- days, we practice spinal anaesthesia as an alternative procedure for open cholecystectomy operation. Because it is safe, cost effective and easy procedure than that of general anaesthesia. It also offers better post operative pain control capacity than general anaesthesia without limiting recovery. In case of general anaesthesia, we need anaesthesia machine and gasses such as O₂, N₂O and Halothane which are not available in the peripheral clinics also. So we can practice spinal anaesthesia as an alternative of general anaesthesia for open cholecystectomy operation in the peripheral clinics for its easy availability, simple procedure and cost effectiveness.

Methodology

After obtaining written informed consent of the patient a total 100 patients of ASA grading I & II were selected for elective open cholecystectomy operation.

These patients then divided into two groups by random selection. Group A contain 50 patients for spinal Anaesthesia and Group B contain 50 patients for general Anaesthesia.

Group A – Patients were prepared for spinal Anaesthesia in sitting position and a 25 –gauge pencil point spinal needle was introduced in to the sub-arachnoid space at the L2-L3 intervetebral space under aseptic conditions.

After free flow of C.S.F. was obtained 4ml of hyperbaric bupivacaine hydrochloride and 20µg of

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fentanyl citrate were injected intrathecally. Then the patient was placed in the supine position, staying in the Trendelenburg position (Head down) about 30° for 5 to 10 minutes. Then Head down position decreased to 10° (by uplift the head end of the table). Then we used some sorts of I.V anaesthetic drugs such as low dose ketamine hydrochloride 0.5 mg/kg with atropine or low dose opioids (about ¼ th of the normal dose) if necessary before surgical incision which acts as pre-emptive analgesia. We also used anti-emetic drug (Inj. Vergon/Emistate), H₂ –receptor blocker or atropine to decrease para-sympathetic effects such as vomiting or bradycardia. Then after surgery started we monitored the patients. If the mean arterial blood pressure decreased by more than 20% below the preanesthetic value, an intermittent I.V inj. of Ephedrine hydrochloride was given every 3 to 5 minutes interval.

Group-B –Patients were prepared for general Anaesthesia. Induction done by propofol (2 to

3mg/kg) or T.P.S (5mg/kg) with or without fentanyl as pre-medication. Then intubation done by suxamethonium. Then in maintenance phase used long acting muscle relaxant (Vacuronium or Pancuroinim) and ventilated with oxygen and nitrous oxide gasses mixed with volatile anaesthetic agent such as Halothane. Then after completion of the operation reverse was done by Neostigmine with atropine.

Then these patient were monitored per-operative and post operative period by both clinical and instrumental monitoring.

Results

Between September, 2011 to September 2012 100 patients entered our ongoing trial. They were randomized to have open cholecystectomy under spinal (n-50) or general (n-50) anaesthesia. The 2 groups were similar regarding demographich and physical characteristics in **Table 1**.

Table 1. Characteristics of patients undergoing open cholecystectomy.

Characteristics	Type of Anaesthesia used	
	Spinal (n-50)	General (n-50)
Age	25 to 60 years	30 to 65 years
Sex & No	F-30 M-20	F-28 M-22
ASA grading I & II	I-35 II-15	I-30 II-20
Operation time	45 minutes (40 - 50 minutes)	50 minutes (45 – 55 minutes)
Total anaesthesia duration	50 minutes (45 -55 minutes)	65 minutes (55 -75 minutes)
Hospital stay	7 days	8 days

Intra operative events related to surgical and /or anaesthetic procedure presented in Table-2

Table-2 Intra operative adverse events

Adverse events	Received Spinal Anaesthesia (No - 50)	Received general Anaesthesia (No -50)
Nausea/vomiting	2	-
Sweeting / Tearing	-	2
Tachycardia / Bradicardia	Bradicardia -2	Tachycardia -3
Hypertension /Hypo tension	Hypo tension -2	Hypertension -3
SPO2 & HR (Pulse oxymeter)	SPO2 ↓ & HR ↓-2	SPO2 normal & HR -3
Muscle relaxation	Same	Same
Pain sensation	Profound Analgesia	Analgesia not so Profound
Surgeons statement	Same	Same

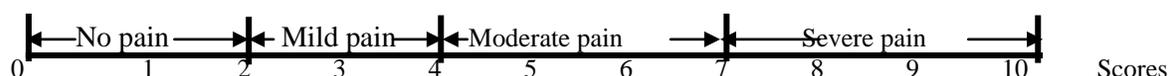
Post operative events related to surgical and/or anaesthetic procedure presented in Table-3. Pain assessed by visual analog scale (VAS) was significantly less for the spinal anaesthesia group at 2 hours, 4 hours and 8 hours post operatively

and supplementary post operative Opioid analgesia was less required. After 2 weeks follow up, the quality of life and patients satisfaction scores were similar in the 2 groups. No late complications were reported by telephone.

Table-3 Post-operative adverse events

Adverse events		Received Spinal Anaesthesia (No -50)	Received general Anaesthesia (No - 50)
Pain (VAS method)	Immediate	Absent (VAS Scores 1-2)	Present (VAS Scores 5-6) Analgesic drug required.
	After 2 hours	Present (VAS Scores 3- 4) Analgesic drug not required.	Present (VAS Scores 7-8) Narcotic drug such as Opioid analgesic required.
	After 4 hours	Present (VAS Scores 5-6) Analgesic drug such as NSAID required.	Present (VAS Scores 5-6) 2nd dose of analgesic drug NSAID group required.
	After 8 hours	Present ((VAS Scores 8-9) Narcotic drug such as Opioid analgesic required.	Present (VAS Scores 8-9) 2nd dose of narcotic drug required.
Hypertension		Absent	Present -3
Tachycardia		Absent	Present -3
Urinary retention		Present -3 (relieved by catheterization)	Absent
Respiratory pattern		Normal	Not satisfactory -5
Consciousness /Recovery		Well alert	Not well alert

NB. – By VAS (Visual analog Scale) method - score 0-2 indicate No pain, score 2-4 indicate mild pain, score 4-7 indicate moderate pain and score 7-10 indicate severe pain.



Discussion

The interim analysis of our study not only confirmed the feasibility of safely performing open cholecystectomy under spinal anaesthesia as the sole anaesthetic procedure but also showed the superiority of spinal anaesthesia in post operative pain control compared with the general anaesthesia. Further more supplementary opioids were administered in significantly fewer patients having spinal anaesthesia compared with those having general anaesthesia. This difference could be attributed to a combination of several factors; the avoidance of endotracheal intubation related discomfort, the presence of adequate levels of analgesia for the first few hours after the completion of the surgical procedure owing to the existing activity of the analgesia injected in this subarachnoid space and the potentially minimal stress response associated with a

minimal invasive anaesthetic procedure, such as spinal anaesthesia. Post operative pain control is probably the main factor that characterizes smooth recovery. On the other hand, Post operative pain in general anaesthesia group of patient causes tachycardia and hypertension. Also due to pain patient take shallow and insufficient respiration which may cause cyanosis in general anaesthesia group of patient. 3 patients of spinal anaesthesia group develop urinary retention that can be easily overcome by giving instant catheterization.

Intraoperative events of note in spinal anaesthesia group included bradycardia, hypotension and vomiting etc can easily overcome by giving intermittent administration of injection ephedrine hydrochloride and atropine.

To our knowledge, this is the first controlled randomized trial that compares the application of

spinal with general anaesthesia in “the average” patient who undergoes elective open cholecystectomy. Moreover, it appears that spinal anaesthesia is more effective than general anaesthesia on post operative pain control during the patient's hospital stay. From these preliminary data, it appears that spinal anaesthesia is a promising method of anaesthesia for open cholecystectomy operation and with proper refinements, it could potentially evolve as the new gold standard anaesthetic approach for elective open cholecystectomy in healthy patients.

Conclusion

The study findings that we got was very much important. From this study it can be concluded that the outcome of patients' Consciousness and pain control capacity is better in patient undergoing open cholecystectomy operation by spinal anaesthesia than general anaesthesia in the post operative period. So it can be recommended to use spinal anaesthesia as an alternative of general anaesthesia in our developing country because it is cost effective, safe, easy procedure and better analgesic effect with normal consciousness level persist in the post operative period.

References

1. G. Edward Morgan, clinical Anaesthesiology, 3rd edition 2002: 266, 319
2. Graham Smith, 4th edition 553, 560
3. Steven M Yentis, Nicholas P, Hirsch, Gray-B Smith Anaesthesia and intensive care A-Z, 2nd edition -504.
4. Churchill Living stone 2000- 01
5. Baumann TK, Simone DA, Shain CN, LaMotte RH; Neurofenic hyperalgesia; the search for the primary cutaneous afferent fibres that contribute to capsaicin induced pain and hyperalgesia. Journal of Neurophysiology 1991; 66; 212-227.
6. Dickenson AH, A cure of wind up; NMDA receptor antagonists as potential analgesics. Trends in pharmacological Science 1990; 11:307-309.
7. Down lode from www.archsurg.com on march6, 2012@2008 American Medical Association.
8. Gupta A. Local analgesia for pain relief after laparoscopic cholecystectomy, a systemic review. Best pract Res Anaesthesiology 2005; 19(2): 275-292.
9. Luchetti M. Palomba R, Siea.Mussa G, Tufano R. Effectiveness & safety of combined epidural & general anaesthesia for laparoscopic surgery, Reg. Anesth. 1196; 21(5): 465-469.
10. Tzovars G/ Fafoulakis F, Pratsas K, Georgopoulous S, Stamatiou G, Hatzithecofilou, C- Laparoscopy Cholecystectomy under spinal anaesthesia , a pilot study, Surg, Endosc. 2006; 20(4): 580-582.

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