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Original Article

Comparative Study between General Anesthesia and Spinal Sub-Arachnoid Block for Cholecystectomy in a District Level Hospital of Bangladesh

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Abstract

Background: Open cholecystectomy is now routinely done in district level hospitals in our country. Both general anesthesia (GA) and spinal sub-arachnoid block (SAB) can be used for this. GA has some side effects, costly, needs expertise and apparatus. SAB is cheap and has less complications. **Objective:** The objective of this study is to find out the suitability of GA and SAB in district level hospital. **Materials and Methods:** In this prospective study, total 90 cases were included and all were admitted in 250 Bedded General Hospital, Naogaon between January 2019 and December 2020. All cases were divided into two groups. In group GA 45 cases were operated under GA and in group SAB another 45 cases were operated under SAB. Data were collected in a pre-designed questionnaire and analyzed by computer based software and results were presented in tabulated form. **Results:** Each group had 45 patients. Mean age were 42.3±12.17 years and 41.4±11.8 years in GA group and SAB group respectively. 75.6% were male in GA group and 80% in SAB group. 71.1% and 66.7% cases in ASA Grade I in GA and SAB group respectively. In GA group, 37.8% had diabetes mellitus, 33.3% had hypertension and in SAB group, it were 33.3% and 26.7% respectively. In GA group, mean duration of surgery was 24.8±1.2 minutes with 39.64±4.39 minutes total elapsing time. In SAB group it were 23.46±2.02 minutes and 35.64±2.31minutes respectively. In GA group, 57.8% had shoulder pain, 22.2% had PONV and no patient had headache or urinary retention. But in SAB group, 13.3% had urinary retention and 8.9% had headache. SAB patients had more pain at 6th hour post-operatively. Average cost of anesthetic drugs in SAB was 142.22±13.80 taka and that of GA was 1220±42.50 taka. **Conclusion:** As SAB has less complications, needs less expertise and remarkably cheap. It is more preferable than GA at district level hospitals in Bangladesh.

Key words: Anesthesia for cholecystectomy, Anesthesia in district level hospital, Cholecystectomy in Bangladesh

Introduction

Laparoscopic approach is the standard choice for cholecystectomy.[1] But in our country specially at district and upazilla level open cholecystectomy is still done routinely due to lack of access to necessary equipment, shortage of expert manpower and patient`s financial condition is also an important factor.[2]

In our country, for open cholecystectomy anesthesiologists use mainly two types of anesthesia- General Anesthesia (GA) and Spinal Subarachnoid Block (SAB). Though GA is the gold standard[3] it needs special care and expertize for intubation and also needs special equipments. This procedure is also costly as it uses several drugs including gases. There are some drawbacks of GA. These are basal atelectasis, post-operative paralytic ileus, aspiration of gastric contents, longer stay time at post-operative ward and increased mortality and morbidity.

On the other hand, SAB provides selective blockade of surgical site and has some advantages. In SAB, patient can maintain spontaneous respiration (no need of artificial ventilation), reduced incidence of paralytic ileus, creates some hypotension that reduces wound bleeding and above all it is relatively cheap as it needs few drugs and no extra instruments.[4] The

disadvantages are- a challenge to face hypotension and rarely accidental high blockade that may need ventilation. The present study was done to compare the suitability of GA and SAB for open cholecystectomy in district level hospitals in terms of post-operative pain free interval and analgesic requirement, costing, patients` and surgeons` satisfactions.

Materials and Methods

Our study was carried out on 90 patients admitted in 250 Bedded General Hospital, Naogaon for open cholecystectomy (from January 2019 to December 2020). All patients were adult, both male and non-pregnant female of ASA group I & II. After decision for open cholecystectomy, routine investigations for anesthesia like CBC, RBS, S. Creatinine, ECG, CXR PA view and Liver function tests were done. Patients with any contraindication to GA or SAB were excluded from this study. Written informed consents were taken from all patients. Tab. Diazepam 5mg was given orally as premedication at night before surgery and patients were kept fasting for 6 hours before surgery. In this study, total 90 patients were divided in to two groups randomly. Group-G (patients requiring GA, n= 45) and Group-S (patients requiring SAB, n= 45). Patient`s baseline physiological parameters (pulse, BP, respiratory rate, temperature, weight) were recorded before operation. After IV cannulation with 18G cannula standard rules were followed for fluid replacement during surgery and post-operative period. Operation was done through right subcostal incision. In Group-S, under all aseptic precaution sub-arachnoid space was approached through L_1-L_2 space with 27G spinal needle in sitting position. 4 ml (0.5%) of Bupivacaine Heavy (20mg) was injected into the sub-arachnoid space and patient`s position was changed to supine position immediately. Pain sensation was tested in the desired surgical field before starting the operation. Intra-operatively, analgesics, sedatives, antiemetic and ephedrine were used as par requirements of the patients. In Group-G, induction of anesthesia was done with thiopental sodium (5 mg/kg). Suxamethonium (2 mg/kg) was used to facilitate intubation. Veccuronium was used as muscle relaxant. Anesthesia was maintained with Halothane, Nitrous Oxide and Oxygen. For reversal, neostigmine (.01 mg/kg) and atropine were used. Post-operatively, anti-emetics and analgesics were used as par requirements of the patients. Before starting the study ethical clearance was taken from the Superintendent of 250 Bedded General Hospital, Naogaon

Results

Table - I: Baseline characteristics of the study patients (n=90)

Baseline characteristics	General Anesthesia (n=45) Mean±SD		Spinal Anesthesia (n=45) Mean±SD		P value
Age (years)	42.3±12.17		41.4±11.8		0.71^{ns}
Sex					
Male	34	75.6%	36	80%	0.61^{ns}
Female	11	24.4%	9	20%	
BMI (kg/m^2)	23.65±4.16		24.12±5.12		0.63^{ns}
ASA grade					
I	32	71.1%	30	66.7%	0.57^{ns}
II	13	28.9%	12	26.7%	
III	0	0	3	6.7%	

Table - I shows the baseline characteristics, male was found 34 (75.6%) in general anesthesia group and 36 (80.0%) in spinal anesthesia group. Mean age was 42.3±12.17 years and 41.4±11.38 years in general and spinal anesthesia group respectively. Mean BMI was 23.65±4.16 kg/m2 in general anesthesia group and 24.12±5.12 kg/m2 in spinal anesthesia group. ASA grade I was found 32 (71.1%) in general anesthesia and 30 (66.7%) in spinal anesthesia group. The difference was not statistically significant ($p>0.05$) between two groups.

All patients were diagnosed cases of chronic calculus cholecystitis. No case of acute or acalculus cholecystitis or gallbladder mass was included in this study.

In our study, diabetes mellitus was found 17 (37.8%) cases in general anesthesia group and 15 (33.3%) in spinal anesthesia group. Hypertension was 15 (33.3%) and 12 (26.7%) in general and spinal anesthesia group

respectively. COPD was 2 (4.4%) in general anesthesia group and 5 (11.1%) in spinal anesthesia group. The difference was not statistically significant (p>0.05) between two groups.

Table- II : Mean duration of surgery and total time (n=90)

Duration (min)	General anesthesia (n=45) Mean±SD	Spinal anesthesia (n=45) Mean±SD	p value
Duration of surgery	24.8±1.2	23.46±2.02	0.03^{s}
Total duration	39.64±4.38	35.64±2.31	0.02^{s}

Table -II shows that mean duration of surgery and total elapsing time.

Table- III : Distribution of patients by post-operative adverse events (n=90)

Post -operative adverse events	General Anesthesia (n=45)		Spinal Anesthesia (n=45)		P value
	n	%	N	%	
Shoulder pain	26	57.8	11	24.4	0.004^{s}
Nausea/vomiting	10	22.2	3	6.7	0.03^{s}
Urinary retention	0	0.0	6	13.3	0
Headache	0	0.0	4	8.9	0
Hypotension	2	4.4	2	4.4	1.0^{ns}
Paralytic ileus	2	4.4	3	6.7	0.34^{ns}

Table - I shows the baseline characteristics, male was found 34 (75.6%) in general anesthesia group and 36 (80.0%) in spinal anesthesia group. Mean age was 42.3±12.17 years and 41.4±11.38 years in general and spinal anesthesia group respectively. Mean BMI was 23.65±4.16 kg/m2 in general anesthesia group and 24.12±5.12 kg/m2 in spinal anesthesia group. ASA grade I was found 32 (71.1%) in general anesthesia and 30 (66.7%) in spinal anesthesia group. The difference was not statistically significant (p>0.05) between two groups.

All patients were diagnosed cases of chronic calculus cholecystitis. No case of acute or acalculus cholecystitis or gallbladder mass was included in this study.

In our study, diabetes mellitus was found in 17 (37.8%) cases in general anesthesia group and 15 (33.3%) in spinal anesthesia group. Hypertension was 15 (33.3%) and 12 (26.7%) in general and spinal anesthesia group respectively. COPD was 2 (4.4%) in general anesthesia group and 5 (11.1%) in spinal anesthesia group. The difference was not statistically significant (p>0.05) between two groups.

Table- IV: Post-operative pain evaluation (n=90)

Time (hours)		General anesthesia (n=45)	Spinal anesthesia (n=45)	p value
		Mean±SD	Mean±SD	
VAS	At baseline	8.1±0.7	0.7±0.1	<0.001^{s}
	2 hours	6.9±0.6	0.8±0.2	<0.001^{s}
	4 hours	5.8±0.9	1.8±0.8	<0.001^{s}
	6 hours	4.1±0.6	4.0±0.7	0.46^{ns}
	12 hours	3.2±0.8	1.1±0.8	<0.001^{s}
	24 hours	2.1±0.5	0.6±0.4	<0.001^{s}

ns=not significant
s=significant

Table- IV shows, all pain levels were significantly low in spinal anesthesia group except post-operative 6th hour than general anesthesia group.

Our study showed a significant difference in stay period in post-operative ward. In general anesthesia group average stay in post-operative ward was 6.89±1.23 hour and in spinal anesthesia group 4.56±0.85 hour. This difference was significant statistically as p<0.05.

This study showed an interesting finding regarding the average cost of anesthetic drugs used during anesthesia. In general anesthesia it was 1270.00±42.50 Taka and in spinal anesthesia it was 142.22±13.80 Taka. This difference is statistically significant (p<0.05).

Discussion

Though laparoscopic cholecystectomy is the method of choice for cholecystectomy, open cholecystectomy is also extensively practiced in our country especially at district and upazilla level due to shortage of expert

manpower. Anesthesiologist usually prefer general anesthesia for open cholecystectomy due to easy control over patient and surgeons prefer it due to good muscle relaxation. As expertize is developing, both surgeons and anesthesiologists are now preferring spinal subarachnoid block (SAB) due to easy procedure, less post-operative hazards and less costly. In this study the mean ages of patients were 42.3±12.17 years and 41.4±11.8 years in GA group and SAB group respectively. The difference was not statistically significant (p>0.05) between two groups. Similar observation was found by Donmez et al.[5] They showed that the mean age were 45±13 years in GA group and 45±14 years in SAB group. The difference was not statistically significant (p>0.05) between two groups. In a study in Nepal by Koju RB et al.[6] showed the mean age 42.05±12.4 years in GA group and 44.60±12.73 years in SAB group. The difference was also not statistically significant (p>0.05) between two groups.

Male was found 34(75.6%) in GA group and 36(80%) in SAB group. The difference was not statistically significant (p>0.05) between two groups. The study of Koju et al.[6] in showed increased number of patients in both GA and SAB groups. This may be due to selective referral of male patients to government hospital as privacy of female patients is somewhat less in government hospitals.

In present study, the mean BMI was 23.65±4.16 kg/m^2 in GA group and 24.12±5.12 kg/m^2 in SAB group. The difference was not statistically significant (p>0.05) between two groups. Almost similar observation were found in the studies of Yu et al.[7], Donmez et al.[5] and Koju et al.[6] Patients with high BMI were not included in this study as district level hospitals are usually not equipped with ICU or HDU.

In this study ASA grade I was found 32 (74.11%) in GA group and 30 (66.7) in SAB group. The difference was not statistically significant (p>0.05) between two groups. Similar observation was found in the study of Donmez et al.[5] and Koju et al.[6]

Regarding the co-existing morbidity, diabetes mellitus was found 17 (37.8%) in GA group and 15 (33.3%) in SAB group. Hypertension was 15 (33.3%) in GA group and 12 (26.7%) in SAB group. COPD was 2 (4.4%) in GA group and 5 (11.1%) in SAB group. The difference was not statistically significant (p>0.05) between two groups. These figures were almost similar to other studies.[5]

Regarding the duration of surgery, the mean duration of surgery was 24.8±1.2 min in GA group and 23.46±2.02 min in SAB group. Mean total elapsing time was found 39.64±4.38 min and 35.64±2.31 min in GA and SAB group respectively. Both mean duration and total elapsing time were statistically significant (p<0.05). But in Yu et al.[7] study, there was no statistically significant difference in mean operating time in GA and SAB groups. In our study the significant lower operating time in SAB group may be due to relatively less bleeding in the operating field, as there was hypotension induced by SAB anesthesia. Total surgical time in GA group is more than that of SAB group. It is because, GA group patients need reversal of general anesthesia after surgery. SAB group patients do not need any reversal after surgery. In another study[8], the surgery time both in GA and SAB were higher. In our study, the lower operating time may be due to high cumulative experience of the surgeons as all operations were done by senior level surgeons.

In this study, shoulder pain was found 36 (57.8%) n GA group and 11(24.4%) in SAB group which was statistically significant (p>0.05) between two groups. Paralytic ileus and hypotension were not statistically significant (p>0.05) between two groups. Nausea and vomiting was common in GA group and was statistically significant (p<0.05) between two groups. But urinary retention and headache were common in SAB group. We did not found any such case in GA group. This is due to totally different technique of anesthesia. SAB directly involves sub-arachnoid space and central nervous system and induce anesthesia in lower half of the body. As there is no reversal, the duration of anesthesia is unpredictable. Similar incidence was also found in some other studies.[5, 7,9] These events are related to type of anesthesia, not directly to the surgery.

In this study, postoperative pain levels were significantly low in spinal anesthesia group except postoperative 6th hour than GA group. The reduced pain in the SAB group may be due to a persistent neuraxial blockade by spinal anesthesia. Two studies comparing the spinal anesthesia and general anesthesia for laparoscopic cholecystectomy by Tiwari et al.[10] and Tzovaras et al.[11] reported the better postoperative pain control and lower analgesic requirement in spinal anesthesia than general anesthesia due to lasting analgesic effect. In these two studies VAS levels at 6th and 8th hours after the surgery were lower than our study. This difference is considered that it could be related with methodological difference between the studies. The difference of the two studies from our study is standard postoperative intravenous analgesia and if needed additive opioids usage for patients.

Regarding the mean stay period in postoperative ward, we found 6.89±1.23 hour in GA group and 4.56±0.85 hour in SAB group. This difference was statistically significant ($p<0.05$) between two groups. In a study by Ganter MT et al.[12] the average length of stay postoperative ward was 5.7±5.9 hour and it was in between GA and SAB groups of our study. The shorter stay period in SAB group was due to the fact that SAB involved only lower half of the body sparing the respiratory system. In case of GA patients need mechanical ventilation and had a high incidence of PONV.[13, 14] So they needed longer time to become stable to shift to surgical ward.

In this study we found an important observation. This study showed that the mean cost of anesthetic drugs in GA group was 1220.00±42.50 Taka and in SAB group it was 142.22±13.80 Taka. In a study by Shitong et al.[15], the cost of GA and SAB were 145.25$ and 104.18$ respectively. This means, the cost of GA was almost 1.4 times that of SAB. But in our study it was 8.6 times than that of SAB. So we found, the cost of SAB is always lower than that of GA, but in our study it was remarkably low.

Conclusion

Open cholecystectomy can be done under both GA and SAB. Both are safe with few complications. SAB is much cheaper than GA. SAB also needs less postoperative care. In district and upazilla level hospitals where facilities are less available, SAB is the better than GA in all respects. This cheap anesthesia can also be introduced in tertiary level hospitals. Yet to be studied further.

References

1. Khan MN, Ashraf MN, Khan HD: Spinal anesthesia versus general anesthesia for open cholecystectomy: comparison of postoperative course. Ann. Pak. Inst. Med. Sci. 2013;9:95-8 .
2. Shaikh GS, Shaikh SM, Bhatti Y, Deenari RA, Baloch I, Soomro Q:Risk factors resulting in conversion of laparoscopic to open cholecystectomy. Med. Channel. 2010;16:302-5.
3. Pursnani KG, Bazza Y, Calleja M, Mughal MM: Laparoscopic cholecystectomy under epidural anesthesia in patients with chronic respiratory disease. Surg. Endosc. 1998; 12:1082- 4.
4. Ray UK and Bhattacharyya R. General anesthesia versus spinal anesthesia in laparoscopic cholecystectomy: safety, feasibility, and affordability in rural hospital in India. Research and Opinion in Anesthesia & Intensive Care 2019;6:261–265.
5. Donmez T, Erdem VM, Uzman S, Yildirim D, Avaroglu H, Ferahman S, Sunamak O. Laparoscopic cholecystectomy under spinalepidural anesthesia vs. general anaesthesia: a prospective randomised study. Ann Surg Treat Res 2017;92(3):136-142.
6. Koju RB, Dongol Y, Verma R. Effectiveness of Spinal Anesthesia versus General Anesthesia for Open Cholecystectomy. J Nepal Health Res Counc 2016;14(33):93-8
7. Yu G, Wen Q, Qiu L, Bo L and Yu J. Laparoscopic cholecystectomy under spinal anesthesia vs. general anesthesia: a meta-analysis of randomized controlled trials. BMC Anesthesiology 2015; 15:176.

8. Ellakany M. Comparative study between general and thoracic spinal anesthesia for laparoscopic cholecystectomy. Egyptian Journal of Anaesthesia. 2013; 29, 375–381.
9. Jensen P, Mikkelsen T, Kehlet H. Postherniorrhaphy urinary retention: effect of local, regional, and general anesthesia: a review. Reg Anesth Pain Med. 2002;27:612–7.
10. Tiwari S, Chauhan A, Chaterjee P, Alam MT. Laparoscopic cholecystectomy under spinal anesthesia: a prospective, randomized study. J Minim Access Surg 2013;9:65-71.
11. 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.
12. Ganter MT, Blumenthal S, Dubendorfer S et al. The length of stay in the post-anesthesia care unit correlates with pain intensity, nausea and vomiting on arrival. *Perioper Med* **3**, 10 (2014). http://doi.org/10.1186/s13741-014-0010-8
13. Singh RK, Saini AM, Goel N, Bisht D, Seth A. Major laparoscopic surgery under regional anesthesia: A prospective feasibility study. Med J Armed Forces India 2015;71:126-31.
14. Mehta PJ, Chavda HR, Wadhwana AP, Porecha MM. Comparative analysis of spinal versus general anesthesia for laparoscopic cholecystectomy: a controlled, prospective, randomized trial. Anesth Essays Res 2010;4:91-5.
15. Shitong Li, Margarita Coloma et al. Comparison of the Cost and Recover Profiles of Three Anesthetic Techniques for Ambulatory Anorectal Surgery. *Anesthesiology* November 2000; 93, 1225-1230.

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