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Original Article

Spinal Versus General Anesthesia for Laparoscopic Cholecystectomy

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Abstract

Laparascopic Cholecystectomy under regional anesthesia alone has been reported only with severe chronic obstructive airway disease[1,2]. In a randomised trial, epidural with general anesthesia have been found to be more effective in lessening postoperative pain compare with general anesthesia alone[3]. Regional anesthesia has been successfully used for laparascopic cholecystectomy in patient. Hamad and Ibrahim El-Khatter[4] used spinal anesthesia for laparoscopic for the first time. We performing Laparascopic Cholecystectomy with carbondioxide pneumoperitoneum under spinal anesthesia alone of healthy patients with symptomatic gall stone disease[5]. We design a control randomized trial to compare spinal anesthesthesia with the Gold standard general anesthesia for elective Laparascopic Cholecystectomy in healty patients.

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Introduction

Currently Laparoscopic surgery has been widely used for cholecystectomy. It is cost saving because it has been associated with decrease length of hospital stay compare conventional surgery. Laparoscopic cholecystectomy requires an anesthetic technique which provides for a rapid recovery and minimize the incidence of side effects. On the other hand, the pressure for the hospital resources has forced clinicians to develop specific pathways to accelerate recovery from anesthesia and hospital discharge[1,2].

In addition, need to prevent postoperative PONV and pain management and advocated propofol base technique. However regional anesthesia has not been used as the sole anesthetic procedure other than in the high risk patient[3]. We have successfully and safely Laparoscopic cholecystectomy with low pressure carbon dioxide[6]. We have notice that spinal anesthesia results minimal post operative pain. The aim of the present study was to compare spinal anesthesia versus general anesthesia for elective laparoscopic cholecystectomy in term of hospital stay, complications, recovery times.

Methods

After hospital approval and written inform consent, fifty patient of ASA 1-11,who were undergo Laparoscopic cholecystectomy, were enroll for study and age between 18 -55 years. Patient were divided into two groups (25 each), spinal anesthesia group (SA) and general anesthesia group (GA). Inclusion criteria were patient BMI less than 30 and normal coagulation profile. Exclusion criteria were acute choecystities, cholangities, pancreatities, previous open surgery upper abdomen, any contraindication spinal anesthesia.Data recorded from patient mean

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arterial pressure (MAP), heart rate (HR), tissue oxygen circulation (SpO_2) and $EtCO_2$.

Postoperative pain was assessed using visual analogue scale (VAS) at 2,4,8,12, and 24 hours; total analgesic requirement, PONV and occurance of shoulder pain were recorded. The following data were also recorded; duration of surgery. Conversion to general anesthesia, discharge from from the hospital. GA group, anesthesia was induced with inj. propofol 1.5mg/kg and fentanyl 1πgm/kg I/V. Tracheal intubation was done with inj. norcuron 0.1mg/kg. Anesthesia was maintain with halothane 0.75% with 33% O2 with N_2O. The lungs were ventilated to maintain $EtCO_2$ between 30-36 mmHg. Supplemental doses of fentanyl and norcuron were required when needed. Reverse was given by inj. neostigmin and inj atropine. In the spinal group, Spinal anesthesia was performed under complete aseptic precautions, at L2-3 interspaces with the patient sitting position using midline approase with 25 gauge whitacre spinal needle. 17.5mg (3.5ml) inj.bupivacaine heavy (0.5%) mixed 25µgm inj. fentanyl. The patient was turned in supine position with nasal O_2 4 liters/min was applied. Heart rate, BP, spo_2 and Respiratory rate were recorded every minute for 5 min and every 15 min thereafter post operatively. Sensory and motor block were assess by pin prick and Bromage scale until surgery start. Surgery commenced with CO_2 insufflation with a pressure less than 15 mmHg. Anxiety was treated with midazolam 2 mg IV, shoulder pain with fentanyl 50 µg IV plus intraperitoneal instilation of 20 ml of 1% lignocaine. Hypotension was treated inj. ephedrine 5 mg IV repeated as required. During after procedure, the patient were encourage report any discomfort, abdominal or shoulder pain, nausea, vomiting or pruritus. These symptoms were score (0- nil, 1-mild, 2-moderate, 3-severe) every 5 min during surgery and every 15 min postoperatively. Postoperative pain was assessed using visual analogue scale (VAS) at 2, 4, 8, 12 and 24 hour.

Results

Of 25 patients in SA group, 18 were females with mean average age 27.20 ±5.25 yr. (range 18-55yr)and those in GA group 20 were females with a mean age 30.65±6.33 yr. Mean BMI values were 24.35± 4.3 in SA and 26.16±3.26 GA group respectively with no statistical difference(P>0.05). All the procedures were completed laparoscopically. Duration of surgery was 65.32±8.5 min in SA group and 62.52± 7.24 min in GA group respectively with no statistical significance (P>0.05). Conversion from spinal to general anesthesia was not required in any of the case and no major incidence was recorded during the procedure. In 12 patient SA, 6 patients GA groups, blood pressure was decrease more than 20% from pre anesthetic value and control by inj. ephedrine boluses. Shoulder tip pain or discomfort required inj.fentanyl 50 µgm IV and inj. lidocaine (1%) 20 ml on the surface of diaphragm in 14 (%) in SA group. Eight patients developed bradycardia in SA group requiring inj. atropine.

Table- 1: Demographic of patients (mean ±SD)

Parameter	Spinal anesthesia	General anesthesia	P-value
Age (yr)	27.20±5.25	30.65±6.33	NS
BMI	24.35±4.3	26.16±3.26	NS
Anesthesia induction time (min)	12.4 ±5.8	10.6±4.9	0.01
End of surgery to transfer (min)	3.2±0.21	9.2±4.1	0.01
Total duration of Anesthesia (min)	65.32±8.5	62.52±7.24	NS
Time in PACU (min)	40.7±4.4	29.2±7.2	0.01
Hospital stay (days)	1.90±1	2.2±0.38	NS

VAS score at admission to PACU were less with SA than with GA group (P<0.05). The need for analgesics for postoperative pain therapy in the PACU was significantly less in SA versus GA group (p<0.05). Patient was not transfer to ward until full range of movement of lower limbs. GA group less time stay than SA group in PACU 40.7±4.4 min versus 29.2±7 respectively (p<0.05).

All patients were mobilized on the same evening. PONV in PACU was recorded in 5 patients of SA and 8 patients of GA group; which was controlled by inj. Ondensetron. One patient complain of post dural puncture headache (PDPH) treated by conservatively. There is no significant difference regarding hospital stay in both groups; median hospital stay was 1 day (with a range 1 to 3 days) and no patient required readmission for any reason.

Table- 2 : Side effects of anesthesia.

Parameter	Spinal anesthesia	General anesthesia	P-value
Additional opioids during surgery	4	21	<0.001
Additional midazolam during surgery	10	0	<0.001
Shoulder tip pain	14	0	<0.001
Postoperative opioids	4	18	<0.006
PONV in PACU	5	9	< 0.001
PDPH	1	-	NA
Dizziness	0	1	NA
Pruritus	1	0	NA
Urinary retention	3	0	NA
Sinus rhythm tachycardia	0	1	NA

In the present study, We compare d spinal versus general anesthesia for LC in term of hospital stay, side effects,analgesic requirement technique used, intraoperative conditions were comparable in both group. Recovery was faster in SA group compare GA group; but significant increase time to discharge from PACU in SA group compare to GA group was noted. Our results show the superiority of spinal analgesia in postoperative pain control compare with general anesthesia. Regional anesthesia has numerous advantages such as early, recovery, reduce PONV, lower postoperative pain and shorter hospital stay. However, it is necessary to lower insufflation pressure and increase degree head-up tilt. Although laparoscopy in the awake patient appears to be tolarate well, shoulder tip may be a significant intraoperative problem[7]. We found that 56% of our patients experienced shoulder tip pain which was maneged by intraabdominal instilation of lignocaine and IV fentanyl administration.

The use of low pressure pneumoperitoneum in all patients did not jeopardize the adequency of our procedure and view and virtually all of the procedure were completed without any technical difficulty. Intraoperative incidents recorded and related to either method of anesthesia or creation of pneumoperitoneum was similar to those described in other studies[4]. Most patients who receive spinal anesthesia experienced better postoperative analgesia compare to general anesthesia during the first few hours. It is presumably related the avoidance of endotracheal intubation discomfort and the presence of adequate level of analgesia for the first few hours after completion of surgical procedure[4,7].

We found that SA group was associated with significantly low perioperative use of drug compare to GA group.

Discussion

In the present study we compared spinal versus general anesthesia for Laparoscopic cholecystectomy in the term of hospital stay, side effects. In this selected patient population undergoing elective Laparoscopic cholecystectomy intraoperative conditions were comparable in both groups. Recovery was faster in the SA group compare to GA group was noted, but significant increased time to discharge from PACU in SA group compared to GA group was noted. Our results show the superiority of spinal analgesia in postoperative pain control compared with the general anesthesia.

Regional anesthesia has numerous advantages such as early recovery, reduced PONV, lower post operative pain and shorter hospital stay. However, it is necessary in laparoscopic surgery to use lower insufflation pressure and increase the degree of head-up tilt. Although laparoscopy in the awake patient appears to be tolerated well, shoulder tip pain may be a significant intraoperative problem[6]. We found that 56%of our patients experienced

shoulder tip pain which was managed by intraabdominal installation of inj. lidocaine and I/V fentanyl administration.

The use of low-pressure pneumoperitoneum in all patients did not jeopardize the adequacy of our procedure and view. Most patients who received spinal analgesia experienced better postopertative analgesia compare to those who received general anesthesia during this period.

We found that SA group was associated with significantly low perioperative use of drug and supplies compare to GA group. Time for anesthesia, Surgery and recovery were comparable between both groups.The induction time was shorter in GA group compared with the SA group; however, this advantage was offset by the faster end of surgery to transfer time in the SA group. In our study PACU times in SA group were longer compared to GA group. In our institution, it is standard protocol that patients are not transferred from PACU to the ward until they can move their lower limbs. VAS scores at admission to PACU were less with SA than with GA.

Conclusion

We conclude that spinal anesthesia for Laparoscopic cholecystectomy is associated with lower postoperativve pain and shorter hospital stay, but with higher incidence of shoulder tip pain or discomfort requiring intervention.

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