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KEY WORDS: Spinal Anaesthesia, General Anaesthesia, Lumbar Disc Surgery, Heart Rate, Mean Arterial Pressure, Post-operative Analgesic Usage And Post-operative Vomiting.

STUDY ON COMPARISON OF POST OPERATIVE ANALGESIC USAGE AND POST OPERATIVE VOMITING IN SPINAL ANAESTHESIA VERSUS GENERAL ANAESTHESIA FOR ELECTIVE LUMBAR SPINE SURGERY

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ABSTRACT

BACKGROUND: Either general or regional anaesthesia can be used for lumbar disc surgery. The common anaesthetic technique is general anaesthesia (GA). Some studies have shown reduced surgical time, postoperative pain and postoperative nausea with spinal anaesthesia. **METHODS:** We enrolled a total of 60 cases posted for lumbar spine surgery. Out of which, 30 cases were posted under GA and 30 cases under SA. The heart rate (HR), mean arterial pressure (MAP), analgesic use and post-operative nausea were recorded. **RESULTS:** A total of 60 cases were included in our study, which had been posted for the surgical procedures. We included 30 cases posted for surgery under GA and 30 under SA. There were no statistically significant differences between two groups for demographic characteristics, duration of surgery and PACU stay. There were statistically significant differences in Intra-operative maximum mean arterial blood pressure and heart rate changes and post-operative analgesic use between SA and GA ($p < 0.05$). There was no statistically significant differences in the incidence of post-operative vomiting between two groups. **CONCLUSIONS:** In our study, we found that SA is effective for use in patients undergoing lumbar spine surgery was shown to be the more expedient anaesthetic choice in the perioperative setting. SA was superior to GA in providing postoperative analgesia and decreasing blood loss.

INTRODUCTION

Either general or regional anaesthesia can be used for lumbar spine surgery. The common anesthetic technique is general anaesthesia (GA). However, several studies have been performed comparing these two anaesthetic techniques and have revealed essentially different results.[1-3] SA for spine surgery can include epidural anaesthesia via catheter infusion and SA via injection Some studies have shown that with spinal anaesthesia there was reduction in surgical time, postoperative pain, time in the post anaesthesia care unit (PACU), incidence of urinary retention, postoperative nausea, and more favourable cost-effective.[4-6] The most commonly used technique is endotracheal general anaesthesia (GA) for spinal surgeries. This may be due to a variety of factors, including greater patient acceptance, its enabling of long surgeries, and capacity for secure airway establishment in the prone position. Despite encouraging results in favour of SA, SA does not come without risk, and there is no clear evidence to delineate the difference in morbidity and mortality between the two approaches.[7-8] In a study conducted by Scott et al, showed that the pulmonary complications were more common in cases who underwent GA compared with regional anaesthesia. Some other retrospective studies shown that SA resulted in better outcome compared with GA in patients underwent surgeries on lumbar spine.[9-11]

OBJECTIVE OF THE STUDY

The objective of the study is to compare the incidence of post-operative analgesic usage and post-operative vomiting in spinal anesthesia versus general anesthesia in the cases undergoing lumbar surgery

MATERIALS AND METHODS

Source of data and Study design: This is a randomised clinical study, conducted at Raipur Institute of Medical Sciences, Raipur. We included 60 cases aged 20-50 years old who were scheduled for discectomy, laminectomy, for aminotomy or cord tumour. Patients with history of seizure or intracranial hypertension, contraindication for spinal anaesthesia, severe spinal stenosis, a near complete or total myelographic block, myelographic demonstration of arachnoiditis, inadvertent production of high spinal, drug or alcohol abuse were excluded. If patients had any changes in surgical technique or massive bleeding during operation which needed blood transfusion, were excluded from the study. Patients were randomly allocated into GA or SA groups with 30 and 30 patients in each group respectively. No premedication was given to the patients.

In GA group, patients were anesthetized with Propofol (2 mg/kg IV), Lidocaine (1.5 mg/kg), and Fentany (1.5 g/kg IV). Endotracheal intubation was facilitated with Atracurium (0.6 mg/kg IV). Anaesthesia was maintained with 1.2% Isoflurane and Nitrous Oxide 50% in Oxygen. Nalbuphine was administered for intraoperative analgesia. The heart rate (HR), systolic (SBP), diastolic (DBP), mean arterial blood pressure (MABP), and oxygen saturation were monitored every 15 minutes throughout the surgery using ECG, non-invasive blood pressure monitoring and pulse oximetry.

In SA group, the block was done with 3.0-3.2 ml 0.5% Bupivacaine in an 8.5% Dextrose solution combined with 25 μg Fentanyl after preloading patients with 7 ml/kg Lactated Ringer's solution over 10-15 minutes. Thereafter, the patients were placed into a sitting position and preparing and draping were done. Spinal anaesthesia was performed using a 25-gauge Quincke spinal needle at either the L4 or L5 interspace after local infiltration of 2-3 ml of 2% Lidocaine. After observing spinal fluid, Bupivacaine and Fentanyl was administered into intrathecal space and patients were placed in supine position. Five to ten minutes after establishment of spinal level of block, the patients were placed into prone position. Oxygen at 2L/min via nasal cannula was administered afterwards. Throughout the surgery, if the patients had bradycardia (HR <60 per minutes) or hypotension (SBP < 90 mmHg), 0.5 mg Atropine or 5 mg Ephedrine was administered. Throughout the surgery, sedation of patients was done by a Propofol infusion of 25-50 g/kg/min IV. At the end of surgery, the Propofol was discontinued and the patient was turned from the prone position to supine were transferred to the PACU. At the time of patient arrival to the operating room, age, sex, height, weight, and ASA physical status were recorded. Throughout the administration of anaesthetics, maximum HR and MABP changes compared to the baseline were recorded. Postoperative analgesic use and total administered dosage of Meperidine were recorded till 24 hours after surgery. In addition, the incidence of nausea was recorded. Intravenous Ondansetron IV was administered to patients with vomiting and for nausea if lasted more than 10 minutes. If the VAS score was more than 4 mm, Nalbuphine was given intravenously. If patients were awake and had no pain, nausea, vomiting, or

hemodynamic instability, they were discharged from PACU in Group GA.

In Group SA, when patients had no pain, nausea, vomiting, and at least two segment regression of spinal block, they were discharged from the PACU.

STATISTICAL ANALYSIS

Data are presented as mean ± SD or number (percent). The parameters mentioned in table 1 are compared using Student's t-test & table 2 using chi-square test. P-value < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION

A total of 60 cases were included in our study, who had been posted for the surgical procedures. We included 30 cases posted for surgery under GA and 30 under SA. There were no statistically significant differences between two groups for demographic characteristics, duration of surgery and PACU stay (table 1)

Table 1: Shows demographic characteristics of the subjects included in the study

	GA (no=32)	SA (no=30)
Age (in years)	42.1 4.2	412.3
Gender (M/F)	16/14	20/10

Table 2: Shows that there was Intra-operative maximum MABP and HR changes were significantly less in SA compared with GA (p < 0.05)

Table 2: Shows intra-operative Mean SD of MABP, HR changes between two groups

	GA (no=32)	SA (no=30)	P value
Maximum MABP (mmHg)	+22.0 5.7	-25.64.9	<0.05
Maximum HR changes	+16.2 4.9	-11.8 4.1	<0.05
Post-operative analgesic use	8	0	<0.05
Post-operative nausea	2	1	>0.05

DISCUSSION

In our study, we included 30 cases posted for surgery under GA and 30 under SA. There were no statistically significant differences between two groups for demographic characteristics, duration of surgery and PACU stay. that there was Intra-operative maximum mean arterial blood pressure and heart rate changes were significantly less in SA compared with GA.

Our results were similar to the case-control study conducted by McLain et al in 400 patients underwent either SA or GA for performing lumbar decompression, showed that SA caused shorter anaesthesia duration, decreased incidence of nausea and analgesic needs, and accompanied with fewer adverse effects. This finding was in contrast to the study conducted by Sadrolsadat et alstudy that showed SA had no advantages over GA. Furthermore, they concluded that GA can decrease adverse effects accompanied with technique of anaesthesia. They requested further clinical trial studies to verify their results.[12] The results of our study are in conclusion with studies conducted in the past.

The mechanism why SA presumably decreases blood loss is vasodilatation and hypotension caused by sympathetic blockade_ Patients under SA have spontaneous ventilation which causes lower intrathoracic pressure and consequently less distension of epidural veins. This is another and more important mechanism of decreasing bleeding after surgery. This finding that maximum intraoperative mean arterial blood pressure and heart rate changes over the basal value were significantly less in Group SA is not unexpected, because SA prevents the increase in stress hormones better than GA. Two different mechanisms can explain decreasing postoperative analgesic use in the SA. One mechanism is the preemptive effect of SA that decreases the pain scores by preventing afferent nociceptive sensitization pathway. Lower analgesic requirement after operation pointed out such an effect. The second mechanism is probably existence of some residual sensory blockade in SA group. This is due to lagging of sensory recovery behind motor recovery.[13]

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