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Comparison of Patient Satisfaction between Spinal versus General Anaesthesia for Lumbar Disc Surgery

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Abstract **Original Research Article**

Background: Lumbar discectomy is most commonly performed under general anaesthesia, which can be associated with several perioperative morbidities including nausea, vomiting, atelectasis, pulmonary aspiration, and prolonged post-anaesthesia recovery. It is possible that fewer complications may occur if the procedure is performed under spinal anesthesia. ***Objective:*** To assess the Patient Satisfaction between Spinal versus General Anaesthesia in Patients for Prolapse Lumbar Intervertebral Disc (PLID) Surgery. ***Methods:*** A Comparative study was carried out at the Dept. of Anesthesiology, 250 Bed General Hospital, Noakhali, Bangladesh from January 2018 to December 2020. One hundred (100) healthy and co-operative patients ASA I-II were recruited and randomized into two equal groups, with half of these patients receiving spinal anaesthesia (n-50) and the remainder general anaesthesia (n-50). A comprehensive postoperative evaluation was carried out documenting any anaesthetic complications, pace of physiological and functional recovery and patient satisfaction. Variables were recorded as pain level using a visual analogue scale (VAS) at 1, 6, 12 and 24 hours; patient level of satisfaction during the stay on the ward using verbal rating scale (VRS) as it was detected by A p-value < 0.05 were considered as significant. ***Results:*** In our study Spinal anaesthesia patients achieved the milestones of physiological and functional recovery more rapidly and reported less postoperative pain. Perioperative hypotension in 26% of patients and none was hypertensive in spinal group and in G/A Group 06% of patients was hypotensive and 20% were hypertensive. Postoperative pain intensity more in G/A group than spinal group. Patient satisfaction in spinal group was more comparative to G/A group. ***Conclusion*:** In conclusion, Spinal anesthesia is a reasonable alternative to general anesthesia for the patients with ASA grade I/II and preferably single level pathology in the lumbar spine. Spinal anaesthesia ensures better operating conditions, better postoperative pain control and a quicker postoperative recovery when compared to general anaesthesia.

Keywords: PLID, Surgery, Spinal, General Anaesthesia.

INTRODUCTION

Lumbar discectomy is one of the commonest spine surgeries. Lower thoracic or lumbar discectomy is possible to be performed under spinal anesthesia. However, it usually performed under general anesthesia [1]. The surgical management of a prolapsed lumbar disc was first described by Mixter and Barr in 1934 [2]. These include discectomy, laminectomy, or lamino-foraminotomy. Results are almost similar regardless of operative techniques (macro versus micro) and types of anesthesia used [3, 4]. All these procedures can be safely performed either by using general anesthesia (GA) or regional anesthesia i.e. spinal anesthesia (SA). Different anaesthetic techniques have been used for lumbar spinal surgery. Another advantage of general anesthesia is the avoidance of airway compromise. However, the feasibility of general anesthesia in simple discectomy is questioned. On the other side, regional anesthesia seems to reduce perioperative cardiovascular complications, reduce intraoperative blood loss, reduce postoperative hypoxia or other pulmonary events.

Several studies compared peri & postoperative complications, hemodynamic parameters, cost-effectiveness and operative, anesthesia, and recovery times between GA and SA in spinal procedures [5-8]. Spinal anaesthesia for lumbar spine surgery also decreases the incidence of lower extremity thrombo-embolic complications and does not increase the occurrence of problems with micturition. Most of these studies observed fewer complications, more favorable hemodynamic parameters, and shorter anesthetic time spent with SA than with GA suggesting that this anesthetic modality may even be a superior alternative to the perceived standard of care [9-11]. But some studies found no difference in peri & post-operative outcomes between SA and GA. Even GA seems to be superior in some respects particularly in surgeon satisfaction [12]. Moreover, recent data showed that lumbar spine surgery has been increasing day by day and constitutes a sizable portion of health care spending throughout the world [12]. Nonetheless, several studies reported that SA is a more cost-effective alternative to GA [10, 11, 13]. The presence of conflicting evidence in the literatures, we decided to evaluate the role of GA vs SA in our group of patients and as relevant to our clinical practice.

MATERIALS AND METHODS

A Comparative study was carried out at the Dept. of Anesthesiology, 250 Bed General Hospital, Noakhali, Bangladesh from January 2018 to December 2020. One hundred (100) healthy and co-operative patients ASA I-II undergoing Prolapse Lumbar Intervertebral Disc (PLID) surgery was included in the study. All patients were given written informed consent to participate in the study and also for the procedure they were going to undertake. The exclusion criteria included history of severe cardiac disease, bleeding dyscrasias, infectious process, previous lumbar surgery and multilevel lumbar surgery. Patients were randomized to either the GA or SA group. Each specific mode of anaesthesia was standardised. Patients in the GA group were anaesthetised with Propofol 2.5 mg/kg, fentanyl 2mcg/kg and rocuronium 0.6mg/kg to facilitate endotracheal intubation and mechanical ventilation. After achieving a general anaesthesia patients were then log rolled on to a prone position frame and special care was taken to protect the patient's arms, face, eyes and airway [14].

General anaesthesia was maintained with the use of halothane 0.8% conveyed with a mixture of 40% O2 (FiO2 =0.4) and N2O 60%. Neuromuscular block was antagonised with neostigmine 0.4mg/kg and atropine 0.02mg/ kg at the end of the surgical procedure. Patients in the SA group received their block in a sitting position with hyperflexion of the lumbar spine. After the lower back was prepared and draped, the skin was infiltrated with 2-3 ml of 1% Lignocaine. Then a 25 G Quinkee spinal needle was introduced one or two levels above the herniated disc. 2.5 to 2.8ml of 0.5% Bupivacaine Heavyt + inj. fentanyl 12.5 mg was injected into the subarachnoid space. Postoperative analgesia was administered in the form of Injection pethedine 2 mg/kg intramuscularly in both group of patient stat and 6 (six) hourly. Comprehensive postoperative evaluation concentrated on documenting any complications specific to the particular mode of anaesthesia, recording the pace at which the various milestones of physiological and functional recovery were reached and the level of patient satisfaction with the type of anaesthesia used.

Statistical analysis of data

The statistical package for social science (SPSS) version 16 (SPSS Inc., Chicago, Il., USA), running on IBM-compatible computer running windows® 7. Independent samples "t" test was used to compared between two means (two quantitative variables), while Chi square or Fisher exact tests were used to compared between categorical groups. Mean± standard deviation (SD) were the representative measures of numerical data, while frequency and percentages were used to represent categorical data. P value < 0.05 was set as the marginal level of significance.

RESULTS

Our study demographic characteristics did not differ between the two groups (Table-1). The distribution of men and women in both SA and GA groups was comparable as well as the distribution in relation to the level of surgery. No serious complication specific to their particular mode of anaesthesia occurred in either group (Fig 1 & 2). Significance of difference between Spinal and G/A group in postoperative pain relief by VAS estimated after 1, 6, 12, 24, hours (Table-2). Level of comfort after surgery by VRS (verbal rating score) was better in spinal group comparative to G/A group. Time of total duration of Surgery showed highly significant value in spinal group than G/A Group (Fig-3).

Table-1: Demographic characteristics of patients (N=100)

Group	Age (mean) in Years		Sex		Body Weight	
	Mean	SD	M	F	Mean	SD
Spinal (n-50)	41.10	1.18	51	29	57.20	1.77
G/A (n-50)	42.80	1.59	47	33	56.80	2.36
Statistical analysis was done by student's 't' test P value < 0.05 significant						

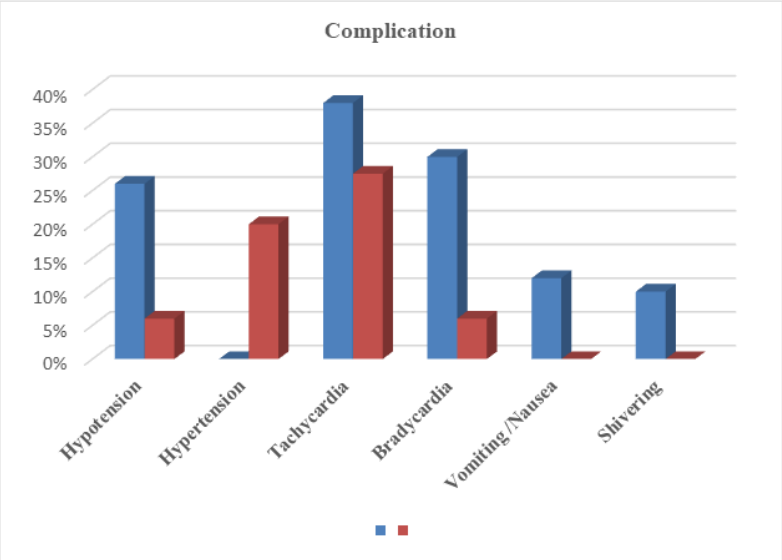

Fig-1: Complication spinal vs General Anaesthesia

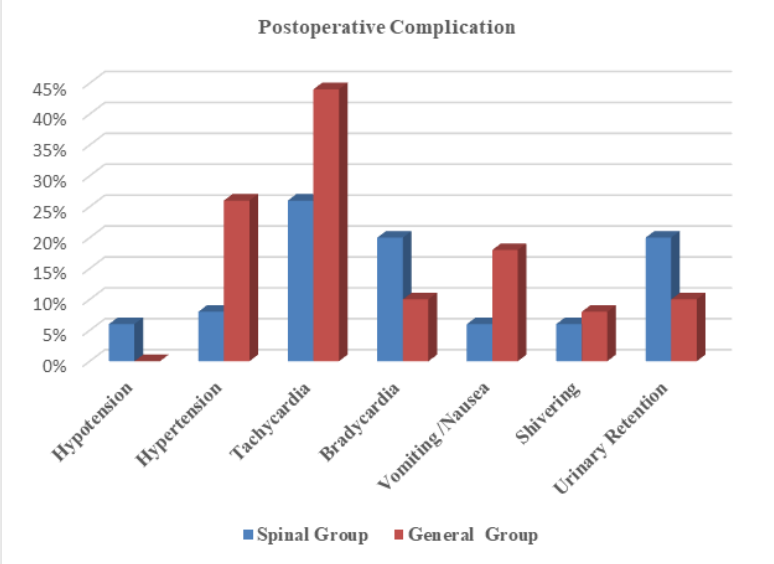

Fig-2: Postoperative Complication

Table-2: Assessment of postoperative pain relief by VAS score (mm) estimated after 1, 6,12,24, hours and surgery time period (N=100)

Time period	Spinal Group		G/ A Group		P
	Mean	SD	Mean	SD	
After 01 hrs	29.5	10.6	39.1	12.3	<0.001
After 6 hrs	38.8	12.5	46.2	7.5	<0.05
After 12 hrs	34.3	8.6	41.3	9.7	<0.01
After 24 hrs	32.4	10.6	39.3	10.2	<0.01
Time of total duration of Surgery	74.06 min		85.05 min.		<0.001
Statistical analysis was done by student's 't' test, Value are expressed p. p<015 significant(**)					

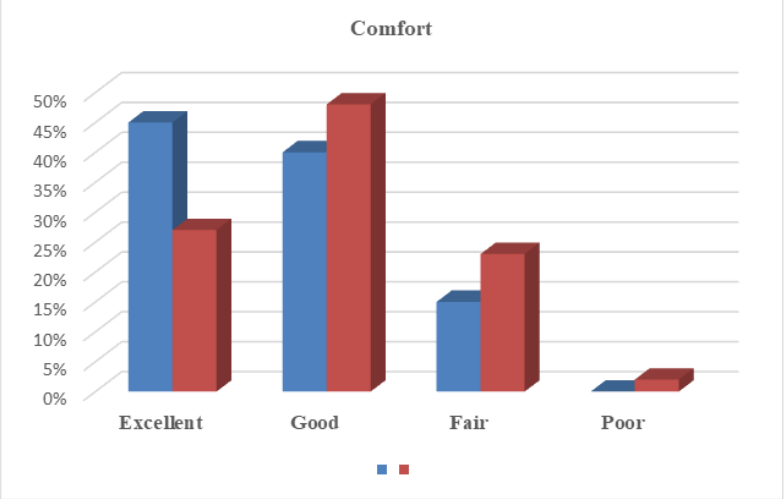

Fig-3: Comfort after surgery. By VRS (verbal rating score)

DISCUSSION

Lumbar spine surgery can be done either by using GA or SA. McLain *et al*., [4] reported SA was as effective and safe as GA in lumbar spine surgery. Shorter duration of anesthesia, lower PONV and analgesic requirement, and fewer side effects were also noted by them. Conversely, Sadrolsadat *et al*., [11] concluded that GA has more advantages and it decreases the incidence of side effects related to anesthesia. However, no studies in the English literature have compared patient satisfaction evaluating functional recovery variables [15]. The present study showed that the anesthesia period was significantly brief in the SA group which was consistent with McLain *et al*., [4]. It is because more time is required to intubate, extubate, and transfer the patient to the post-operative room which is not needed in SA. Furthermore, less assistance is required for positioning the patients for SA [10, 11]. We think another advantage of SA and its associated shorter duration of anesthesia is that it facilitates more efficient use of the operating room. Moreover, the time spent in giving the SA was much lesser than the GA. The only other recent reports involving large numbers of patients are from Jellish *et al*., [16] in the USA. In our study SA has demonstrated to be superior to GA from the patient's satisfaction point of view. Pain level reported by GA patients was always higher than SA patients and the difference was especially significant at 8 hours. Similarly there are significant differences in the level of comfort, SA patients reporting a better level of comfort in general, similar studies reported by J. Perez Rodriguez *et al*., [17]. Pethidine was used as postoperative analgesia. According VAS Score GA group reported a higher level of pain with similar significance at 1, 6, 12 and 24 hours. There is no significant difference between gender and level of pain. Direct relation between the age of the patient and the level of pain was found, especially in the SA group, with a higher level of pain in older patients [18]. However, spinal anesthesia was superior in the aspects of lower duration of hospital stay, lower need for continuous infusion of vasoactive drugs and lower rate of postoperative nausea and vomiting. In addition, spinal anesthesia was associated with shorter operative time and lower blood loss. However, the difference did not reach statistical significance levels. Despite adequate anesthesia and statistically insignificant duration of surgery between the two groups, the surgeon's satisfaction was lower in the patients received SA. Surgeons are more familiar with GA and awake patients adversely affect their satisfaction in the SA group, which may also lead to prolonged duration of surgery. But, significantly better patient and surgeon satisfaction were observed by Dagher *et al*., [6] in the SA group. Sadrolsadat *et al*., [11] noted surgeon satisfaction similar to the present study. However the level of satisfaction was significantly higher in the SA group. Spinal anaesthesia ensures better operating conditions, better postoperative pain control and a quicker postoperative recovery when compared to general anaesthesia for single level lumbar spine surgery. Spinal anesthesia was as safe and effective as general anaesthesia for patients undergoing lumbar laminectomy. Potential advantages of spinal anaesthesia include a shorter anaesthesia duration, decreased nausea, antiemetic and analgesic requirements, and fewer complications. Several studies also support this evidence [19, 20] which was also observed in this study. The most important reason for this result is that the cost of medications used in spinal anesthesia is much lower than in general anesthesia.

CONCLUSION

In conclusion, Spinal anesthesia is a reasonable alternative to general anesthesia for the patients with ASA grade I/II and preferably single level pathology in the lumbar spine. Spinal anaesthesia ensures better operating conditions, better postoperative pain control and a quicker postoperative recovery when compared to general anaesthesia.

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