

Original article :

Comparison of Spinal versus General Anesthesia in Patients Undergoing Orthopedic Surgery at a Tertiary Care Centre

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Abstract

Background: Hip and knee replacement are common orthopedic surgeries and can be performed either under spinal (SA) or general anesthesia (GA). Hence; under the light of above mentioned data, the present study was undertaken for comparison of spinal versus general anesthesia in patients undergoing orthopedic surgery.

Materials & Methods: A total of 50 patients who reported to the department of orthopedics were enrolled in the present study. After meeting the inclusion criteria, all the 50 patients were divided into two study groups as follows: Group A: Patients underwent surgical procedure under spinal anesthesia, Group B: Patients underwent surgical procedure under general anesthesia. Detailed demographic profile and clinical details of all the patients was recorded in Microsoft excel sheet. All the surgical procedures were commenced under the hands of skilled and experienced orthopedic surgeons. Follow-up records were maintained in all the patients.

Results: Mean blood loss among patients of spinal anesthesia group was 189 ml, while mean blood loss among patients of the general anesthesia group was 122 ml respectively. Significant results were obtained while comparing the mean blood loss among patients of the two study group. However; no- significant results were obtained while comparing the mean duration from surgery to ambulation among both the study groups.

Conclusion: General anesthesia was comparatively better than spinal anesthesia in terms of average blood loss among patients undergoing orthopedic surgeries.

Keywords: Anesthesia, General, Spinal, Orthopedic.

INTRODUCTION

Hip and knee replacement are common orthopedic surgeries and can be performed either under spinal (SA) or general anesthesia (GA). So far, little is known concerning the cost-effectiveness of SA compared to GA. Patients who have a proximal femoral fracture are usually offered surgery to treat the injury. The vast majority of these operations will require some type of anaesthesia. Anaesthesia may be general

anaesthesia or regional anaesthesia.¹⁻³ General anaesthesia involves complete loss of consciousness. This may be achieved by either inhalational agents or intravenous anaesthetic agents. Regional anaesthesia is conducted by numbing the nerves that supply sensation to the lower limbs, with the injection of local anaesthetic solution into the fluid surrounding the spinal cord. There are two types of regional anaesthesia, spinal

and epidural.^{4,5} Hence; under the light of above mentioned data, the present study was undertaken for comparison of spinal versus general anesthesia in patients undergoing orthopedic surgery.

MATERIALS AND METHODS

The present study was conducted in the Department of Orthopedics and Department of Anaesthesiology, Dr.Ulhas Patil Medical College & Hospital, Jalgaon Khurd, Jalgaon, Maharashtra (India) and it included comparison of spinal versus general anesthesia in patients undergoing orthopedic surgery. Ethical approval was obtained from the ethical committee of the institution. Also, written consent was obtained from all the patients after explaining in detail the entire research protocol. A total of 50 patients who reported to the department of orthopedics were enrolled in the present study.

Inclusion criteria for the present study included:

- Patients who reported with femoral neck fractures or trochanteric fractures

- Patients within the age group of 30 to 70 years,
- Patients with negative history of any metabolic disorder,
- Patients with negative history of any known drug allergy

After meeting the inclusion criteria, all the 50 patients were divided into two study groups as follows:

- Group A: Patients underwent surgical procedure under spinal anesthesia,
- Group B: Patients underwent surgical procedure under general anesthesia

Detailed demographic profile and clinical details of all the patients was recorded in Microsoft excel sheet. All the surgical procedures were commenced under the hands of skilled and experienced orthopedic surgeons. Follow-up records were maintained in all the patients. All the results were analyzed by SPSS software. Unpaired t test was used for assessment of level of significance. P-Value of less than 0.05 was taken as significant.

Graph 1: Demographic profile

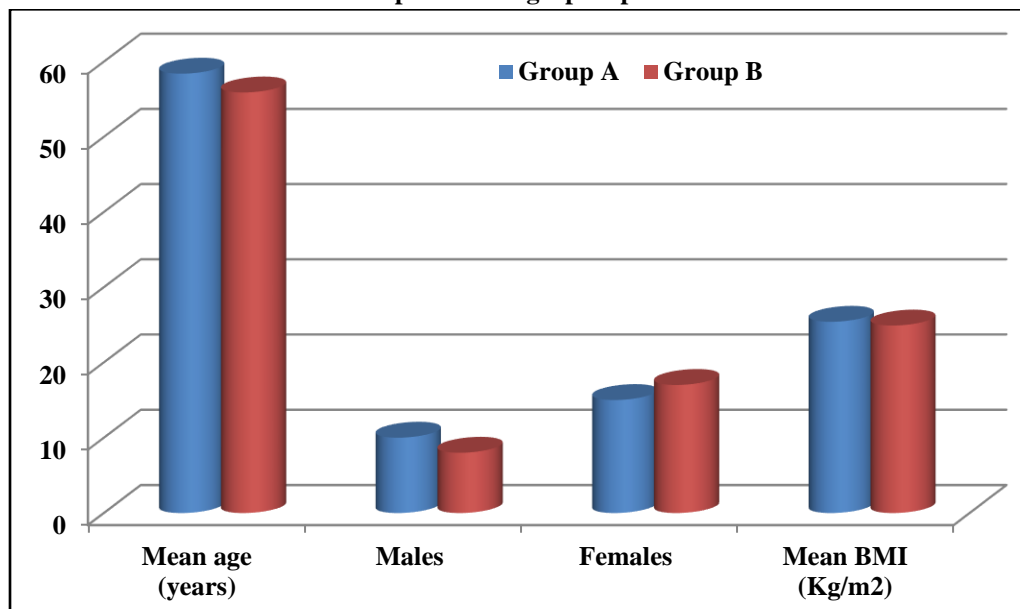


Table 1: Distribution of patients according clinical details

Parameter		Group A	Group B
Fracture	Femoral neck	12	13
	Trochanteric	13	12
Operation	Internal fixation	10	11
	Hemiarthroplasty	15	14

Table 2: Comparison between spinal and general anesthesia

Parameter	Group A	Group B	p- value
Mean blood loss (ml)	189	122	0.00 (Significant)
Duration from surgery to ambulation (chair) time	4 days	4.5 days	0.12
Duration from surgery to ambulation (walking) time	5.3 days	6.1 days	0.82

RESULTS

In the present study, a total of 50 patients were enrolled and were broadly divided into two study groups- Group A and Group B. Mean age of the patients of the Group A and Group B was 58.4 years and 55.9 years respectively. There were 10 males and 15 females in the group A and there were 8 males and 17 females in the group B. In the present study, among the subjects of group A, 12 patients had femoral neck fracture, while remaining 13 patients had trochanteric fractures. Among the subjects of group B, 13 patients had femoral neck fracture, while remaining 12 patients had trochanteric fractures. Among the subjects of group A, 10 patients underwent internal fixation, while remaining 15 patients underwent hemiarthroplasty. Among the subjects of group B, 11 patients underwent internal fixation, while remaining 14 patients underwent hemiarthroplasty. In the present study, mean blood loss among patients of spinal anesthesia group was 189 ml, while mean blood loss among patients of the general anesthesia group was 122 ml respectively. Significant results were obtained while comparing the mean

blood loss among patients of the two study group. However; no- significant results were obtained while comparing the mean duration from surgery to ambulation among both the study groups.

DISCUSSION

During a spinal, local anaesthetic drugs, sometimes in combination with opioid painkillers are injected directly into the cerebro-spinal fluid of the spinal cord. The majority regional anaesthesia administered to hip fracture patients is spinal anaesthesia rather than epidural.⁶ Hip fracture patients are generally elderly and have significant comorbidities. This increases the risks from all types of anaesthesia. At present both regional and general anaesthesia are administered but the eventual choice is the preference and experience of the anaesthetist in discussion with the patient. Although poorly supported by the available literature, it is believed commonly that regional (spinal or extradural) anaesthesia carries a lesser risk than general anaesthesia. Literature has paucity of studies on the mortality associated with surgical correction of upper femoral fractures carried out under regional or general anaesthesia.^{7,8} Hence;

under the light of above mentioned data, the present study was undertaken for comparison of spinal versus general anesthesia in patients undergoing orthopedic surgery.

In the present study, a total of 50 patients were enrolled and were broadly divided into two study groups- Group A and Group B. Mean age of the patients of the Group A and Group B was 58.4 years and 55.9 years respectively. There were 10 males and 15 females in the group A and there were 8 males and 17 females in the group B. In the present study, among the subjects of group A, 12 patients had femoral neck fracture, while remaining 13 patients had trochanteric fractures. Among the subjects of group B, 13 patients had femoral neck fracture, while remaining 12 patients had trochanteric fractures. Among the subjects of group A, 10 patients underwent internal fixation, while remaining 15 patients underwent hemiarthroplasty. Among the subjects of group B, 11 patients underwent internal fixation, while remaining 14 patients underwent hemiarthroplasty. Gonano C et al investigated the economic aspects associated with the two anesthetic techniques for this common surgery. They randomized 40 patients to receive either SA or GA and analyzed the drug and supply costs for anesthesia and recovery. Anesthesia-related times, hemodynamic variables, and pain scores were also recorded. Total costs per case without personnel costs were almost half in the SA group compared with the GA group; this was a result of less cost for anesthesia ($P < 0.01$) and for recovery ($P < 0.05$). This finding was supported by a sensitivity analysis. There were no relevant differences regarding anesthesia-related times. Patients in the GA group were admitted to the postanesthesia care unit with a higher pain score and needed more analgesics than patients in the

SA group (both $P < 0.01$). They concluded that SA is a more cost-effective alternative to GA in patients undergoing hip or knee replacement, as it is associated with lower fixed and variable costs. Moreover, SA seems to be more effective, as patients in the SA group showed lower postoperative pain scores during their stay in the postanesthesia care unit.⁹

In the present study, mean blood loss among patients of spinal anesthesia group was 189 ml, while mean blood loss among patients of the general anesthesia group was 122 ml respectively. Significant results were obtained while comparing the mean blood loss among patients of the two study group. However; no- significant results were obtained while comparing the mean duration from surgery to ambulation among both the study groups. Gonano C et al compared the economic aspects and anesthesia relevant times of SA vs. GA in elective orthopedic surgery. They assessed the costs of all used resources (drugs, gas, fluids, medical items) and the clinical relevant times. Personnel costs were neglected. GA was induced by fentanyl and propofol. Intubation was facilitated by rocuronium. Anesthesia was provided by 1 MAC Sevoflurane in 1.5 liter fresh gas flow and by repeated dosages of fentanyl IV. SA was performed after skin infiltration with lidocaine 2% (2-3 ml) by single shot technique at the L 2-3 or L 3-4 interspace with a 26-Gauge needle. For sedation repeated doses of midazolam IV were given. Postoperative analgesia was standardized with paracetamol 1000 mg IV and additional piritramid 3 mg IV boluses. Patients demography and anaesthesia relevant durations were similar in both groups. Costs per case were lower in the SA group compared to the GA group. Whereas, for minor surgery the costs of SA and GA are similar they showed that SA is more cost-effective than GA in longer cases.¹⁰

CONCLUSION

From the above results, the authors conclude that general anesthesia was comparatively better than

spinal anesthesia in terms of average blood loss among patients undergoing orthopedic surgeries. However; further studies are recommended.

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