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Original Research

Assessment Of Complications Associated With Various Anesthetic Techniques In Patients Undergoing Hip Replacement Surgeries: A Retrospective Study

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ABSTRACT

Background: Hip replacement surgery (HRS) is one of the most successful and cost effective interventions in medicine. Choices of anesthesia include central neuraxial blocks (CNB), peripheral nerve blocks (PNB), general anesthesia (GA) or a combination of any two. Hence; the present study was undertaken to assess complications associated with various anesthetic techniques in patients undergoing hip replacement surgeries. **Materials & methods:** The present study included retrospective assessment of complications associated with various anesthetic techniques in patients undergoing HRS. Data records of a total of 100 patients were assessed. Complete demographic and clinical details of all the subjects were obtained. We also recorded the biochemical and hematological findings of all the patients from their record files. In relation to the surgical procedures, occurrence of complications was recorded. All the data was compiled in Microsoft excel sheet and were analyzed by SPSS software. **Results:** All the patients included in the present study were divided into four study groups on the basis of type of anesthesia technique; General anesthesia (GA) group, combined spinal epidural anesthesia (CSEA) group, Spinal anesthesia (SP) group and Lumbar plexus block (LPB) group. Men age of the subjects of the GA, CSEA, SP and LPB group was 64.3, 65.8, 64.8 and 65.9 years respectively. There were 50, 25, 15 and 10 subjects in the GA, CSEA, SP and LPB group respectively. Non-significant results were obtained while comparing the complications occurring in patients undergoing HRS by different anesthetic techniques. **Conclusion:** In patients undergoing HRS, in terms of complications, different anesthetic techniques can be used with equal efficacy.

Key words: Anesthesia, Hip replacement, Surgery

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INTRODUCTION

Hip replacement surgery (HRS) is one of the most successful and cost effective interventions in medicine. It offers reliable relief of pain and considerable improvement in function in patients suffering with osteoarthritis or inflammatory arthritis of the hip.^{1,2} Total hip arthroplasty (THA) is an effective treatment for patients with end-stage arthritic hip condition. It provides pain relief, enhances mobility, and restores function. The percentage of THA being performed on patients younger than 60 is about 40% and is increasing steadily.^{3,4} Choices of anesthesia include central neuraxial blocks (CNB), peripheral nerve blocks (PNB), general anesthesia (GA) or a combination of any two. There is no difference in the duration of

surgery and length of hospital stay in the patients receiving regional anesthesia or GA. Advantages of CNB are good muscle relaxation, reduced blood loss, and reduced incidence of deep vein thrombosis (DVT).⁵⁻⁷ Hence; the present study was undertaken to assess complications associated with various anesthetic techniques in patients undergoing hip replacement surgeries.

MATERIALS & METHODS

The present study was conducted in the department of general anesthesia of the medical institute and it included retrospective assessment of complications associated with various anesthetic techniques in patients undergoing HRS. Ethical approval was

obtained from the institutional ethical committee in written after explaining in detail the entire research protocol. Data records of a total of 100 patients were assessed. Complete demographic and clinical details of all the subjects were obtained. We also recorded the biochemical and hematological findings of all the patients from their record files. In relation to the surgical procedures, following parameters were recorded:

- Type of anesthetic methods,
- Duration of surgical procedure,
- Fluid type and amount administered

All the data was compiled in Microsoft excel sheet and were analyzed by SPSS software. Univariate regression curve was used for assessment of level of significance. P- value of less than 0.05 was taken as significant.

RESULTS

Data records of a total of 100 patients who underwent HRS were included in the present study. All the patients included in the present study were divided into four study groups on the basis of type of anesthesia technique; General anesthesia (GA) group, combined spinal epidural anesthesia (CSEA) group, Spinal anesthesia (SP) group and Lumbar plexus block (LPB) group. Mean age of the subjects of the GA, CSEA, SP and LPB group was 64.3, 65.8, 64.8 and 65.9 years respectively. There were 50, 25, 15 and 10 subjects in the GA, CSEA, SP and LPB group respectively. Common complications encountered among patients in the present study were hypotension, bleeding, embolism and cardiac arrest. Hypotension was seen in 10, 6, 5 and 1 patient of the GA, CSEA, SP and LPB group respectively. Non- significant results were obtained while comparing the complications occurring in patients undergoing HRS by different anesthetic techniques (P-value < 0.05).

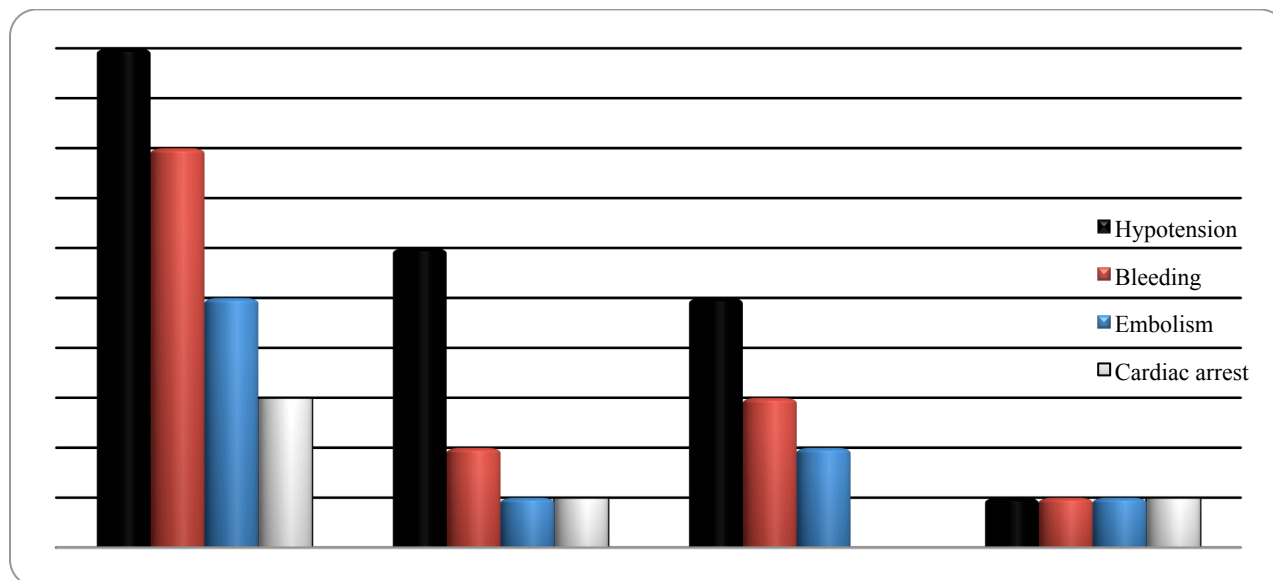
Table 1: Demographic data

Parameter	Type of anesthesia			
	General anesthesia	Combined spinal epidural anesthesia	Spinal anesthesia	Lumbar plexus block
Number of subjects	50	25	15	10
Mean age (years)	64.3	65.8	64.8	65.9
Gender	Males	20	12	6
	Females	30	13	9

Table 2: Complications seen in patients

Complications (n)	Type of anesthesia				P-value
	General anesthesia	Combined spinal epidural anesthesia	Spinal anesthesia	Lumbar plexus block	
Hypotension	10	6	5	1	0.88
Bleeding	8	2	3	1	
Embolism	5	1	2	1	
Cardiac arrest	3	1	0	1	

Graph 1: Complications seen in patients



DISCUSSION

In the present study, data records of a total of 100 patients who underwent HRS were included in the present study. All the patients included in the present study were divided into four study groups on the basis of type of anesthesia technique; General anesthesia (GA) group, combined spinal epidural anesthesia (CSEA) group, Spinal anesthesia (SP) group and Lumbar plexus block (LPB) group. Park YB et al compared the occurrences of perioperative complications of two anesthetic techniques (general anesthesia [GA] and spinal anesthesia [SA] in patients undergoing primary unilateral total knee arthroplasty (TKA). Patients who underwent unilateral primary TKA due to osteoarthritis from January 2005 to January 2014 were retrospectively reviewed. They were divided into two groups: GA (n=490) and SA (n=746). The operation duration, length of perioperative stay in the operation room and occurrences of adverse events in postoperative 30 days (mean, 29.7±3.1 days) were compared. There were significant intergroup differences in mean age and mCCI. The GA group required longer preoperative room time, postoperative room time, and postoperative hospital stay and had more surgical site infections and blood transfusion. No differences in operative duration and other adverse events were identified. They should cautiously consider that GA may be associated with slightly increased preoperative and postoperative room times, postoperative hospital stay, transfusion and surgical site infection rates in primary unilateral TKA.⁸

Mean age of the subjects of the GA, CSEA, SP and LPB group was 64.3, 65.8, 64.8 and 65.9 years respectively. There were 50, 25, 15 and 10 subjects in the GA, CSEA, SP and LPB group respectively. Common complications encountered among patients in the present study were hypotension, bleeding, embolism and cardiac arrest. Pugely AJ et al identified differences in thirty-day perioperative morbidity and mortality between anesthesia choices among patients undergoing total knee arthroplasty. The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database was searched to identify patients who underwent primary total knee arthroplasty between 2005 and 2010. Complications that occurred within thirty days after the procedure in patients who had been managed with either general or spinal anesthesia were identified. Patient characteristics, thirty-day complication rates, and mortality were compared. The database search identified 14,052 cases of primary total knee arthroplasty; 6030 (42.9%) were performed with the patient under spinal anesthesia and 8022 (57.1%) were performed with the patient under general anesthesia. The spinal anesthesia group had a lower unadjusted frequency of superficial wound infections, blood transfusions, and overall complications. The length of surgery (ninety-six versus 100 minutes; $p < 0.0001$) and the length of hospital stay were shorter in the spinal anesthesia group. Patients undergoing total knee arthroplasty who were managed with general anesthesia had a small but significant increase in the risk of complications as compared with patients who were managed with spinal anesthesia; the difference was greatest for patients with multiple comorbidities.⁹

Hypotension was seen in 10, 6, 5 and 1 patient of the GA, CSEA, SP and LPB group respectively. Non-significant results were obtained while comparing the complications occurring in patients undergoing HRS by different anesthetic techniques (P-value < 0.05). Fields AC et al assessed the differences in thirty-day morbidity and mortality for patients undergoing hip fracture surgery with spinal versus general anaesthesia. The American College of Surgeons National Surgical Quality and Improvement Program (NSQIP) database was used to identify patients who

underwent hip fracture surgery with general or spinal anaesthesia between 2010 and 2012 using CPT codes 27245 and 27244. Patient characteristics, complications, and mortality rates were compared. 6133 patients underwent hip fracture surgery with spinal or general anaesthesia; 4318 (72.6%) patients underwent fracture repair with general anaesthesia and 1815 (27.4%) underwent fracture repair with spinal anaesthesia. The spinal anaesthesia group had a lower unadjusted frequency of blood transfusions, deep vein thrombosis, urinary tract infection, and overall complications. Patients who underwent hip fracture surgery with general anaesthesia had a higher risk of thirty-day complications as compared to patients who underwent hip fracture repair with spinal anaesthesia. Surgeons should consider using spinal anaesthesia for hip fracture surgery.¹⁰

CONCLUSION

In patients undergoing HRS, in terms of complications, different anesthetic techniques can be used with equal efficacy. However; further research is recommended.

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