

Assessment of Efficacy of Bupivacaine Plain Versus Bupivacaine with Fentanyl in Spinal Anaesthesia in Geriatric Patients Undergoing Hip Replacement Surgery: A Comparative Study

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ABSTRACT

Introduction: In comparison to general anaesthesia, spinal anaesthesia offers numerous advantages. Spinal lignocaine gives shorter span of analgesic block as well as can cause transient neurological side effects, and henceforth has been pulled back. Hence; the present study was conducted to assess the efficacy of bupivacaine plus fentanyl as spinal anaesthetic agent in patients undergoing total hip replacement surgery.

Material and methods: The present study included assessment of 60 patients of more than 60 years of age who were scheduled to undergo total hip replacement surgery under spinal anaesthesia. Pre-medication of five mg of diazepam was given to all the subjects twelve hours before the starting of the surgery. All the subjects were randomly divided into two study groups; Group 1- included subjects who received hyperbaric bupivacaine plus saline, while Group 2 - included subjects who received local anaesthetic plus fentanyl of similar dose. Recording of all the motor and sensory responses along with occurrence of adverse effects was done. All observations were recorded, compiled and analysed by SPSS software.

Results: Significant results were obtained while comparing the sensory response in between subjects of two study groups. Incidence of discomfort was present in 10 and 5 subjects of group 1 and group 2 respectively. Significant result was obtained while comparing discomfort in between the two study groups.

Conclusion: Despite of occurrence of mild adverse effects, spinal fentanyl appears to be suitable in elderly patients undergoing orthopaedic surgical procedures.

Keywords: Bupivacaine, Fentanyl, Geriatric

INTRODUCTION

Spinal anesthesia is the most advantageous soporific method that offers many points of interest over general anesthesia, including lessened anxiety reaction and enhanced post-agent torment help. Spinal lignocaine gives shorter span of analgesic block as well as can cause transient neurological side effects, and henceforth has been pulled back.^{1,2} However, spinal bupivacaine actuates significant motor block square of longer span and postpones home release after ambulatory surgery. Ropivacaine, an amide nearby sedative, has been acquainted as of late and utilized effectively with give epidural absense of pain to labouring ladies, cesarean delievery and post-agent absense of pain. Intrathecally, it has been utilized for day mind strategies as it furnishes satisfactory tactile piece with early motor recovery.^{3,4} Ropivacaine has an enhanced wellbeing profile over bupivacaine with a diminished focal sensory system and cardio dangerous potential and

henceforth is picking up support.⁵ Intrathecal opioids are synergistic with local anaesthetics, and sensory block is intensified without expanding the sympathetic square while accomplishing palatable nature of spinal anesthesia at a much lower measurement of local analgesic.⁶⁻⁹ Hence; we planned the present study to assess the efficacy of bupivacaine plus fentanyl as spinal anaesthetic agent in patients undergoing total hip replacement surgery.

MATERIAL AND METHODS

The present study was conducted in the department Anaesthesia and surgery of the medical institute and included assessment of 60 patients of more than 60 years of age who were scheduled to undergo total hip replacement surgery under spinal anaesthesia. Ethical approval was taken from institutional ethical committee and written consent was obtained after explaining in detail the entire protocol. Complete and physical examination of all the subjects was done prior to surgery. Inclusion criteria for the present study included:

- Patients of more than 60 years of age,
- Patients without history of any systemic illness,
- Patients without any known drug allergy,
- Patients with negative history of any psychotic disorder

Pre-medication of five mg of diazepam was given to all the subjects twelve hours before the starting of the surgery. Routine monitoring of all the clinical and haematological parameters was done in the operating room. Lactated Ringer's solution was slowly infused in all the subjects. After moving the subject in left lateral position in the operating room, administration of spinal anaesthesia was done through 23 gauge needle at L3-L4. All the subjects were randomly divided into two study groups; Group 1- included subjects who received hyperbaric bupivacaine plus saline, while Group 2 - included subjects who received local anaesthetic plus fentanyl of similar dose. Recording of following parameters was done for comparison:

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- Latency,
- Onset of motor blockage,
- Degree of motor blockage (Bromage Scale ranging from one to four),
- Upper level of sensory block,
- Discomfort during intra-operative period following score as shown in Table 1.

Recoding of all intra-operative vital signs was done after every ten minutes. During the surgical operative period, all haematological and renal parameters were recorded. Recording of adverse effects was also done which included respiratory depression, hypotension, nausea, vomiting etc. Complete recording of all the vital signs was done in recovery room every twenty minutes upto a time period of twelve hours. Time of analgesia request (TAR) values was recorded.

STATISTICAL ANALYSIS

All observations were recorded, compiled and analysed by SPSS software. Chi- square test and student test were used for the assessment of level of significance. P- Value of less than 0.05 was taken as significant.

RESULTS

Mean age of the subjects of group 1 and group 2 was 65.8 and 69.2 years respectively. Mean weight of the subjects in group 1 and group 2 was 64.5 and 68.1 Kg respectively (Figure 1). Mean duration of surgery in group 1 and group 2 subjects was 142.3 and 140.2 minutes respectively. Latency time in subjects of group 1 and group 2 was 14.01 and 13.56 minutes respectively (Table 2). Significant results were obtained while comparing the sensory response in between subjects of two study groups (P- value < 0.05). Incidence of discomfort was present in 10 and 5 subjects of group 1 and group 2 respectively. Significant result was obtained while comparing discomfort in between the two study groups. Hypotension was present in 9 and 11 subjects of group 1 and group 2 respectively (Figure 2). Nausea and vomiting was present in 3 and 1 subject of group 1 and group 3 respectively.

DISCUSSION

It was observed in present study that in inducing spinal nerve block, fentanyl plus bupivacaine does not changes the latency of sensory and motor block in geriatric patients undergoing hip replacement surgery. Khanna MS et al evaluated the risks and benefits of the administration of fentanyl during spinal anaesthesia in the elderly. Forty patients undergoing hip replacement of DHS were studied. Cognitive function, associated pathology, drugs, and treatment were evaluated preoperatively. Spinal anaesthesia was given to the patients Patients with 12.5 mg bupivacaine plus saline (SS; n=20) or 25 mg fentanyl (FN; n= 20). There were 2.6 and 2.9; 2.2 and 2.1 number of ailments and drugs per patient respectively; 30 percent - 35 percent of disorders were untreated, 15 percent - 25 percent were symptomatic, and 25 percent were adequately treated Groups were comparable regarding demographic data and characteristics of the spinal block. Group FN had more pruritis and lower SaO2, but prevalence

Score	Parameter
Zero	Absence of distress
One	Mild (requiring single dose of anxiolytic drugs)
Two	Moderate (requiring two doses of anxiolytic drugs)
Three	Sever (requiring more than two doses of anxiolytic drugs)

Table-1: Intra-operative discomfort score

Parameter	Group 1	Group 2	p value	
Sensory	Latency (min)	14.01	13.56	0.02*
	TAR (min)	189.69	218.14	
Motor	Latency (min)	5.6	5.8	0.52
	Duration (min)	158.3	165.3	
Discomfort	Incidence (n)	10	5	0.01*
	Degree (0- 3)	2.30	1.60	

*: Significant

Table-2: Characteristic of the spinal block

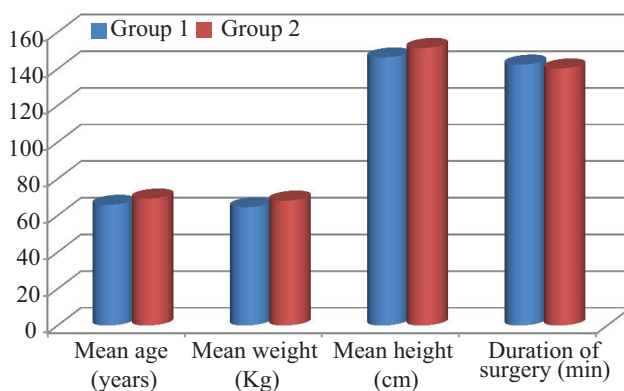


Figure-1: Demographic and clinical details of the patients

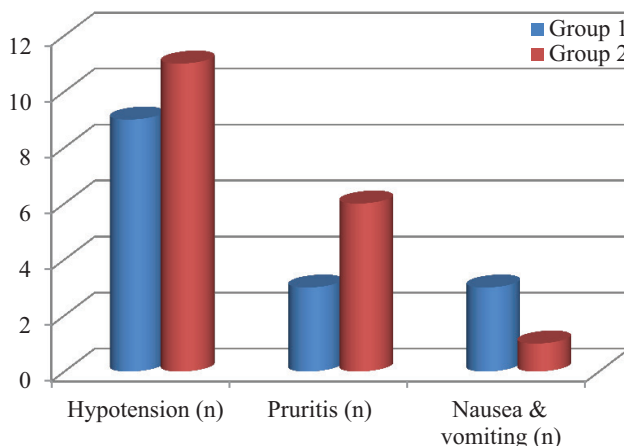


Figure-2: Prevalence of adverse effects in subjects of both groups

of side effects was similar. Pain intensity (visual analog scale [VAS]), at the time of analgesia request (TAR) was lower in group FN. Preoperative values were no different from MMSE at hospital was. Our results show that 25 mg fentanyl administered during spinal anaesthesia to elder patients who were premedicated with benzodiazepines, does not alter any characteristics of motor block but it prolonged the sensory block and improved intraoperative analgesia. It also produced postoperative pain relief while preserving the cognitive function, but induced pruritus and decreased the

oxygen desaturation. The positive effects of fentanyl on pain relief and sensory block justified the use of spinal fentanyl in the elderly.¹⁰ Jaiswal VS conducted this comparative study using 5 mg of hyperbaric bupivacaine with or without fentanyl (25 µg) in unilateral spinal anaesthesia for lower limb surgery. Sixty patients were randomized into two groups with Group B receiving 0.5% bupivacaine and Group BF receiving 0.5% bupivacaine + 25 µg fentanyl intrathecal. Sensory and motor block quality and duration, post anesthesia care unit stay (PACU) and adverse effects were compared. The onset of sensory block (6.17±1.44) was faster in Group B compared Group BF (6.73±1.52) and adding intrathecal fentanyl prolonged the duration of sensory blockade Group BF. But addition of fentanyl in Group BF exerted no effect on the onset and duration of motor block. In 24 patients there was a significantly higher mean duration of stay in PACU suggesting that addition of fentanyl prolonged the recovery duration. None of the patient in any group had hypotension, respiratory depression, sedation, nausea, vomiting, PDPH or TNS. There was 1 patient in both the groups who had bradycardia and 4 patients in Group BF had mild pruritis. Even various studies have reported that in case of short procedures spinal anaesthesia with 5 mg hyperbaric bupivacaine with 25 µg fentanyl is a better option when compared with 5 mg hyperbaric bupivacaine alone in lower limb in orthopaedic surgery.¹¹

Shah S et al compared bupivacaine plain and bupivacaine with fentanyl for spinal anaesthesia amongst geriatric patients. Their study included 60 patients of age 65 year or more who underwent hip replacement surgery. The study population was randomly divided into two groups. In both the groups there was a fall in systolic blood pressure, but the fall was significantly more in Group A. Hemodynamic stability was better in Group B than Group A. Intraoperative supplementation was not required in any group. The duration of motor block was less in Group B. 8 patients amongst group B had pruritus while no patient developed respiratory depression. They concluded that spinal anaesthesia with 2cc bupivacaine 0.5% and 25 µg fentanyl is a better option for elderly patients undergoing lower limb surgeries, with lower incidence of complications without compromising the surgical situations.¹²

CONCLUSION

From the above results, the authors concluded that despite of occurrence of mild adverse effects, spinal fentanyl appears to be suitable in elderly patients undergoing orthopaedic surgical procedures. However, future studies are recommended.

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