ORIGINAL RESEARCH PAPER
Volume - 14 | Issue - 07 | July - 2025 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

COMPARATIVE STUDY OF EFFECTIVENESS OF FEMORAL NERVE BLOCK VERSUS INTRAVENOUS NALBUPHINE IN POSITIONING OF PATIENTS OF FRACTURE NECK OF FEMUR FOR SPINAL ANAESTHESIA

Anaesthesiology

Akshay Yadav — Dept. of Anesthesia
Dr. Ratan Pal Singh — Dept of Anesthesia
Dr. Rangit Priyakar Pandey — HOD Dept. of Anesthesia

ABSTRACT

Introduction: Femoral neck fractures, especially intertrochanteric types, are common in the elderly due to bone fragility and falls. Effective pre-anesthetic analgesia, such as femoral nerve block (FNB) or intravenous nalbuphine, is crucial for optimal spinal block positioning and procedural efficiency. Limited data exist comparing their effectiveness in femoral neck fracture cases.

Aim & Objective:

- To compare the effectiveness of femoral nerve block and intravenous nalbuphine in facilitating optimal positioning for spinal anesthesia in patients with fracture neck of femur.
- To evaluate anesthesiologist satisfaction regarding patient positioning quality with both analgesic techniques.
- To assess patient satisfaction and determine the time taken to perform subarachnoid block after each analgesic intervention.

Methodology: This 12-month randomized controlled study at Rajshree Medical College involved 80 patients (30–80 years, ASA I/II) undergoing fracture neck of femur surgery. Group A received intravenous nalbuphine, and Group B received a PNS-guided femoral nerve block. Pain, satisfaction, and time to perform SAB were assessed, with statistical analysis used. **Results:** Group A (IV Nalbuphine) and Group B (FNB) showed statistically significant differences in ASA Grade distribution ($p = 0.025$). Pain scores (VAS) at 0, 5, and 15 minutes were consistently lower in Group A compared to Group B, indicating better analgesia. Pain during positioning was slightly less in Group A (mean = 4.83) than in Group B (mean = 5.17). The average time to perform spinal anesthesia was shorter in Group A (9.76 minutes) compared to Group B (10.43 minutes). Anesthesiologist satisfaction scores were comparable in both groups. Patient satisfaction was higher in Group B (27.5%) versus Group A (20%), though the difference was not statistically significant ($p = 0.80$). **Conclusion:** Both femoral nerve block and intravenous nalbuphine effectively facilitated positioning for spinal anesthesia in femoral neck fractures. Nalbuphine provided slightly better pain relief and reduced spinal anesthesia time. Patient satisfaction was marginally higher with femoral nerve block. The choice between techniques should consider patient factors, resources, and preferences.

KEYWORDS

INTRODUCTION

Femoral neck fractures, common in orthopedic emergencies, especially in the elderly, occur due to falls, trauma, or high-energy accidents. They are classified into intracapsular and extracapsular types, with intertrochanteric fractures prevalent in older adults due to osteoporosis.[1]. The pain associated with femoral neck fractures is primarily attributed to the richly innervated periosteum, making the condition exceedingly distressing for patients [2]. Prompt analgesia is crucial for humane care and medical procedures. Standard treatment for femoral neck fractures includes surgical fixation or joint replacement, with spinal anesthesia preferred for its safety and pain control [3]. Achieving optimal positioning for spinal anesthesia in femoral neck fractures can be challenging due to severe pain. Pre-anesthetic pain relief strategies, including opioids and nerve blocks, help manage preoperative pain[4]. Ultrasound-guided FNB and FICB reduce pain with fewer side effects.[5]. These blocks work by targeting the femoral nerve or the lumbar plexus branches, thereby attenuating nociceptive transmission from the fracture site [6]. Intravenous nalbuphine offers analgesia with fewer side effects like respiratory depression, sedation, and nausea [7]. Comparative data on nalbuphine versus femoral nerve block for positioning comfort is limited. Ultrasound improves regional anesthesia accuracy and safety [8]. This progress has spurred renewed interest in regional blocks as frontline modalities for pain relief in lower limb orthopedic surgeries.

AIM & OBJECTIVE

- To compare the effectiveness of femoral nerve block versus intravenous nalbuphine in facilitating optimal positioning for SAB in femoral neck fracture patients.
- To assess anesthesiologist satisfaction with positioning quality.
- To evaluate patient satisfaction and determine the time taken to perform spinal anesthesia after each analgesic intervention.

MATERIALS AND METHODS

Study Setting and Population

This randomized controlled trial (12 months) was conducted at Rajshree Medical College, Bareilly. Eligible patients had radiologically confirmed femoral neck fractures scheduled for surgical fixation under spinal anesthesia.

Randomization and Interventions

80 patients (30-80 years, ASA I-II) were randomized via computer-generated table:

- Group A (IVN): Intravenous nalbuphine (0.1 mg/kg) 15 min pre-positioning.
- Group B (FNB): PNS-guided femoral nerve block (20 mL 0.2% ropivacaine) 15 min pre-positioning.

Outcome Measures

1. Pain: VAS (0-10) at 0, 5, 15 min.
2. Positioning quality: Anesthesiologist satisfaction (0=unsatisfactory; 3=optimum).
3. Procedural efficiency: Time for subarachnoid block.
4. Patient satisfaction: Binary (yes/no).

Statistical Analysis

Data analyzed using SPSS v26. Multivariate regression adjusted for ASA grade imbalance ($p=0.025$). $p<0.05$ considered significant.

RESULTS

Table 1: ASA Grade Distribution

ASA Grade	Group A (IVN) (n=40)	Group B (FNB) (n=40)	p-value
I	26 (65.0%)	16 (40.0%)	0.025
II	14 (35.0%)	24 (60.0%)	

The above table illustrates that out of total study participants, ASA Grade I was observed in 26 (65.0%) patients in Group A (IVN) and 16 (40.0%) patients in Group B (FNB), whereas ASA Grade II was noted in 14 (35.0%) patients in Group A and 24 (60.0%) patients in Group B, with a p-value of 0.025.

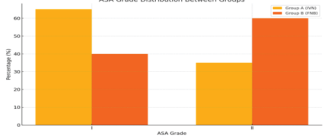


Table 2: VAS Scores

Time	Group	Mean	95% CI	SD
0 min	A (IVN)	5.53	4.82–6.23	2.20
	B (FNB)	6.97	4.26–5.68*	2.21
5 min	A (IVN)	3.13	2.43–3.82	2.17
	B (FNB)	4.27	1.62–2.93*	2.04
15 min	A (IVN)	3.90	1.32–2.48	1.81
	B (FNB)	4.02	0.56–1.49	1.44

The above table illustrates that at 0 minutes, the mean value for Group A (IVN) was 5.53 with a 95% CI of 4.82–6.23 and SD of 2.20, while Group B (FNB) had a mean of 6.97 with a 95% CI of 4.26–5.68* and SD of 2.21. At 5 minutes, Group A (IVN) had a mean of 3.13 with a 95% CI of 2.43–3.82 and SD of 2.17, whereas Group B (FNB) showed a mean of 4.27 with a 95% CI of 1.62–2.93* and SD of 2.04. At 15 minutes, Group A (IVN) had a mean of 3.90 with a 95% CI of 1.32–2.48 and SD of 1.81, and Group B (FNB) had a mean of 4.02 with a 95% CI of 0.56–1.49 and SD of 1.44.

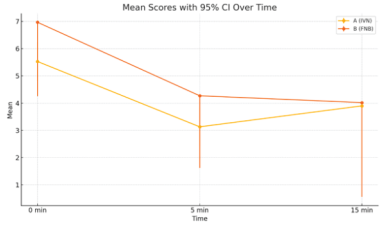


Table 3: Positioning and Procedural Metrics

Parameter	Group	Mean	95% CI	SD
Pain during positioning	A (IVN)	4.83	3.86–5.79	3.01
	B (FNB)	5.17	4.22–6.13	2.99
Time for spinal (min)	A (IVN)	9.76	8.72–10.81	3.27
	B (FNB)	10.43	9.51–11.35	2.88

The above table illustrates that the mean pain during positioning was 4.83 (95% CI: 3.86–5.79, SD: 3.01) in Group A (IVN) and 5.17 (95% CI: 4.22–6.13, SD: 2.99) in Group B (FNB). The mean time for spinal was 9.76 minutes (95% CI: 8.72–10.81, SD: 3.27) in Group A (IVN) and 10.43 minutes (95% CI: 9.51–11.35, SD: 2.88) in Group B (FNB).

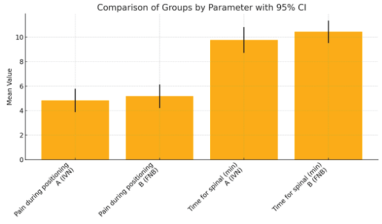


Table 4: Anesthesiologist Satisfaction

Score	Group A (IVN)	Group B (FNB)
0	7 (17.5%)	8 (20.0%)
1	13 (32.5%)	10 (25.0%)
2	9 (22.5%)	12 (30.0%)
3	11 (27.5%)	10 (25.0%)

The above table illustrates that out of total participants, in Group A (IVN), 7 (17.5%) had ASA score 0, 13 (32.5%) had score 1, 9 (22.5%) had score 2, and 11 (27.5%) had score 3, while in Group B (FNB), 8 (20.0%) had score 0, 10 (25.0%) had score 1, 12 (30.0%) had score 2, and 10 (25.0%) had score 3.

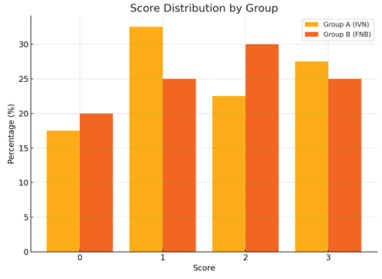
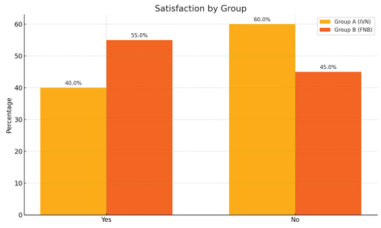


Table 5: Patient Satisfaction

Satisfaction	Group A (IVN)	Group B (FNB)	p-value	χ^2
Yes	16 (40.0%)	22 (55.0%)	0.179	1.80
No	24 (60.0%)	18 (45.0%)		

The above table illustrates that out of total study participants, 16 (40.0%) in Group A (IVN) and 22 (55.0%) in Group B (FNB) reported satisfaction, while 24 (60.0%) in Group A and 18 (45.0%) in Group B did not report satisfaction, with a p-value of 0.179 and chi-square value of 1.80.



DISCUSSION

Pain Control and Positioning

IV nalbuphine showed faster analgesia with lower VAS scores, while FNB had delayed onset, consistent with Durrani et al.'s findings [9].

FNB took longer (10.43 minutes vs. 9.76 minutes in IVN) for spinal anesthesia, contrasting with Hsu et al.'s findings [10], where femoral nerve blocks reduced positioning time, possibly due to ultrasound guidance, which was not used in this study.

Anesthesiologist and Patient Satisfaction

Anesthesiologist satisfaction was similar, but FNB showed higher patient satisfaction (55% vs. 40%), aligning with Kumar et al.[12], who demonstrated better patient comfort with regional analgesia.

ASA Grade Imbalance

ASA grade imbalance ($p = 0.025$) in the FNB group may influence pain perception and satisfaction, with statistical adjustments made.

Clinical Implications

IV nalbuphine acts quickly, but FNB offers superior satisfaction. Future studies should focus on ultrasound-guided FNB and stratified randomization.

CONCLUSION

FNB marginally outperforms nalbuphine in reducing pain and improving efficiency for spinal anesthesia in femoral neck fractures, supporting clinical utility.

REFERENCES

1. Duc TA. Postoperative pain control. In: Conroy JM, Dorman BH, editors. Anesthesia for Orthopedic Surgery. New York, NY: Raven Press; 1994;355- 65
2. Mittal R, Vermani E. Femoral nerve blocks in fractures of femur: Variation in the current UK practice and a review of the literature. Emergency Med. J. 2014;31:143-7. 4.
3. M, Darian AA. Comparison of Femoral Nerve Block with Intravenous Morphine Sulfate for Pain Relief of Femoral Fracture. Asian Journal of Scientific Research. 2015;8:429-35.
4. Parker MJ, Handoll HHG, Griffiths R. Anaesthesia for hip fracture surgery in adults. Cochrane Database Syst Rev. 2004;4:CD000521
5. Jadon A, Kedia SK, Dixit S, Chakraborty S. Comparative evaluation of femoral nerve block and intravenous fentanyl for positioning during spinal anaesthesia in surgery of femur fracture. Indian J Anaesth. 2014;58:705-8.
6. Sia S, Pelusio F, Barbagli R, Rivituso C. Analgesia before performing a spinal block in the sitting position in patients with femoral shaft fracture: a comparison between femoral nerve block and intravenous fentanyl. Anesth Analg. 2004;99:1221-4.
7. Mosaffa F, Esmaelijah A, Khoshnevis H. Analgesia before performing a spinal block in the lateral decubitus position in patients with femoral neck fracture: a comparison between fascia iliaca block and IV fentanyl (Abstract) Reg Anesth Pain Med. 2005;30(1):61.
8. Bajwa SS, Kulshrestha A. Craniofacial and maxillary anomalies: Anesthetics implications and management. J Sci Soc. 2014;41:73-8.
9. Durrani, H. D., et al. (2013). Comparison of femoral nerve block and intravenous nalbuphine for pain management in seated spinal blocks. Journal of Pain Management.
10. Hsu, Y. P., et al. (2019). Comparing femoral nerve block and intravenous analgesia for positioning pain in spinal anesthesia. Pain Management Nursing
11. Purohit, S., et al. (2017). Benefits of femoral nerve block for pain management in patients undergoing central neuraxial blocks. Journal of Clinical Anesthesia.
12. Kumar, A., et al. (2018). Ultrasound-guided femoral nerve block versus intravenous fentanyl in surgical pain relief. Journal of Pain Research.
13. Bantie, et al. (2020). Comparison of nerve blocks and intravenous fentanyl for positioning in spinal anesthesia. Journal of Orthopaedic Surgery and Research.