Asian Journal of Pharmaceutical and Clinical Research

Innovare Academic Sciences
Knowledge to Innovation

Vol 18, Issue 1, 2025

Online - 2455-3891
Print - 0974-2441

Research Article

A COMPARATIVE STUDY OF FEMORAL NERVE BLOCK (WITH AND WITHOUT DEXAMETHASONE) VERSUS INTRAVENOUS FENTANYL FOR POSITIONING AND DURATION OF POSTOPERATIVE ANALGESIA IN FRACTURE FEMUR PATIENT UNDER SPINAL ANESTHESIA

SURABHI WAHI[1], RANJITA ACHARYA[2], MADHUSMITA PATRO[2], SUSHREE DAS[3]*

[1]Department of Anesthesiology and Pain Medicine, Rama Medical College, Hapur, Uttar Pradesh, India. [2]Department of Anaesthesiology and Pain Medicine, IMS and Sum Hospital, Bhubaneswar, Odisha, India. [3]Department of Anaesthesia, IMS and SUM Hospital, Bhubaneswar, Odisha, India.

*Corresponding author: Sushree Das; Email: das.sushri@gmail.com

Received: 05 November 2024, Revised and Accepted: 20 December 2024

ABSTRACT

Objectives: The preferred technique for fracture femur operation is spinal anesthesia (SA). During position for SA, femoral nerve block (FNB) and intravenous (IV) fentanyl are used to decrease the pain. The analgesia provided by FNB with dexamethasone (FNBD), FNB only, and intra-venous fentanyl (FENT) was compared before positioning in patients undergoing femur fracture surgery.

Methods: 90 patients of fracture femurs were randomized into three Groups A (FNBD), B (FNB), and C (FENT). The FNBD and FNB group patients received drug using ultrasound-guided method 5 min before positioning. In FNB, 10 mL of 2% lidocaine with adrenaline (1:200,000) with 10 mL of bupivacaine was injected, 8 mg of dexamethasone was added in FNDB group, and in the FNET group, received IV fentanyl 1 μg/kg 5 min before positioning. Spinal was given and pain score at baseline, 5, 15, and 30 min recorded.

Results: The mean VAS was lowest for Group A and highest for Group C. The Quality of patient positioning is best in Group A and lowest in Group C and p value between Group A and C is <0.0001. The VAS-based assessment of analgesia was highest for Group C at 5 min and 15 min (p<0.0001). The sample size came to be 30 per group by taking alpha as 5%, power of study as 95% and standard deviation as 3. Patient satisfaction score was less in Group FENT (p=<0.0001).

Conclusion: Patient satisfaction, positioning during spinal, and analgesia were better with FNB with or without dexamethasone than IV fentanyl.

Keywords: Femoral nerve block, Spinal anesthesia, Fentanyl, Dexamethasone, Pain, Rescue analgesia, Positioning, Post-operative pain.

 DOI: http://dx.doi.org/10.22159/ajpcr.2025v18i1.53416. Journal homepage: https://innovareacademics.in/journals/index.php/ajpcr

INTRODUCTION

Any fracture is associated with pain, which can affect a person's psychology and behavior. Various studies have been carried out to give relief from this pain during intra-operative and post-operative period [1]. Fracture of femur is very painful injury in which the periosteum has the lowest pain threshold [2]. It is treated by either internal fixation or replacement of the head of femur with arthroplasty [3,4].

Fracture femur consequences in severe pain and optimizing pain are both important and troublesome, especially in elderly. The pain is treated mainly by paracetamol but is not sufficient to control very severe pain. In elderly people, mostly, non-steroidal anti-inflammatory drugs are avoided [5-7].

Various studies have suggested that nerve block is helpful and even enhances early mobilization, as impaired motor function leads to delay in ambulation [8,9]. The systemic effects of opioids can be avoided if regional block is given that targets pain both at movement (dynamic) and at rest (static) [5].

Spinal anesthesia (SA) is beneficial especially for lower-limb and lower abdominal surgeries as it gives brilliant muscle relaxation for the surgeon and total blunting of the surgical stress response [10]. For a successful SA, correct positioning of the patient is a prerequisite.

However, extreme pain and restricted movements are the limitations for an ideal positioning. Measures such as intravenous (IV) fentanyl (FENT), femoral nerve block (FNB), or fascia iliaca block (FICB) with or without adjuvants decrease the pain pre-operatively and help in optimal positioning of patients [2,3]. Sonography-guided FNB is more effective in decreasing pain related with positioning for subarachnoid block in patients undergoing surgery for fracture femur compared to FICB [11].

Femoral blocks with either ultrasound (USG) or nerve stimulator have the same success rate and block duration. However, block by USG has less need for rescue analgesia and less procedure time. Hence, USG-guided femoral block is a fast, safe, and effective method for pain management of fracture femur [12].

Many adjuvants are commonly used with local anesthetic (LA) agents to increase the time of analgesia in nerve blocks and have shown limited success, out of which dexamethasone has shown its efficacy in some clinical studies.

Hence, we intend to compare FNB with and without dexamethasone and IV fentanyl for positioning and duration of post-operative analgesia in fracture femur patients under SA.

Novelty

Our study is comparing three groups of FNB with and without dexamethasone and IV fentanyl which is not done earlier in any other studies. These techniques can also be used in the emergency settings as the patient approaches the emergency department for immediate pain relief. The result of this study can also be used for post-operative analgesia for these patients. Fracture femur is associated with lot of pain which causes mental fatigue in the patients and with these techniques, we may be able to allay their anxiety.

METHODS

This study was conducted in IMS and SUM hospitals from January 2019 to August 2020 after getting ethical clearance vide no. DMR/IMS.SH/SOA/180245 which was prospective randomized double-blinded and comparative. A valid informed written consent had been obtained from each patient. The data collected was kept confidential.

Sample size was calculated using the formula: $n = f(\alpha,\beta) \times 2 \times \frac{\sigma^2}{d^2}$

Where σ is the standard deviation, and: $f(\alpha,\beta) = \left[\phi^{\{-1\}(\alpha)} + \phi^{\{-1\}(\beta)}\right]^2$

Φ^{-1} is the cumulative distribution function of a standardized normal deviation.

Considering power of study as 95%, level of significance (alpha) to be 5%, and effect size as 3; the sample size was calculated to be 30 patients per group. 96 patients were considered for eligibility. 3 patients did not give consent to take part in the study. 93 patients who were remaining were distributed in 3 groups for the study, 31 in Group A, 31 in Group B, and 31 in Group C. Out of them, 1 patient had difficulty in responding to the questionnaire effectively and failed the block leading to exclusion of 2 people. Hence, we got 30 patients in each 3 groups (Table 1).

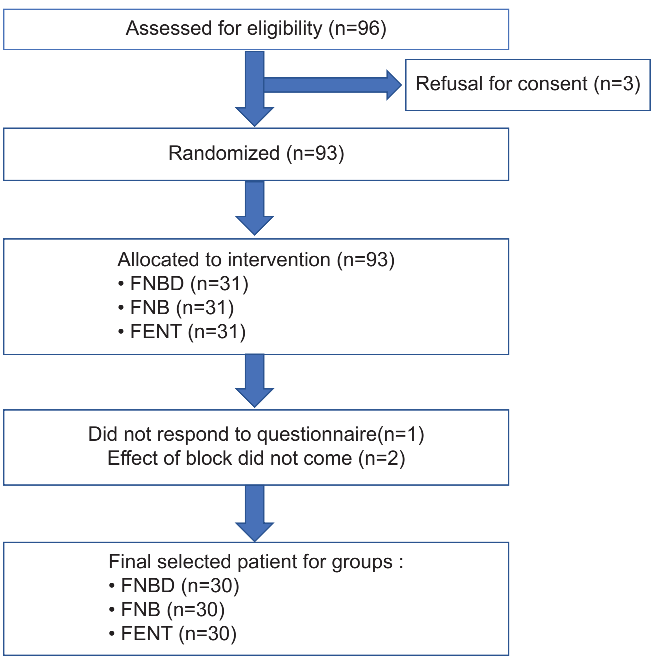
Inclusion criteria

Age 18–65 years of either sex posted for fracture femur surgeries under SA, American Society of Anesthesiologists (ASA) 1, ASA 2, body weight >45 kg, patient being scheduled for surgery under spinal block.

Exclusion criteria

ASA 3, ASA 4, patients with gross spinal abnormalities, patients with severe cardiological, pulmonary, or hepatic disorder, patients with multiple fractures, bleeding disorders, mental disorders, communication gap or any contraindication to SA, pregnant patients, if patients have history of known allergy to any drugs and those who do not give consent to participate in the study.

Table 1: Consort flow diagram



Method

A whole pre-anesthetic check-up was done for all the patients with detailed history taking and physical examination. Complete blood count, blood urea, serum creatinine, blood sugar, serum electrolytes, and urine examination were done in all patients; other investigations were done according to the requirement. All the patients gave a written informed consent. The patients were trained about a 10-cm VAS for pain intensity (ranging from 0 as no pain to 10 as most severe pain) before the surgery. Patients undergoing elective surgeries were premedicated with alprazolam (0.5 mg) and ranitidine (150 mg) the previous night of surgery. Nil per oral guidelines of 6 h was ensured before surgery and an IV cannula was inserted and IV fluid (Ringer's lactate 0.9% normal saline) was initiated. All these patients were randomly divided into three groups of 30 each by computer-related random numbers - Group A (30 patients) – FNB with dexamethasone (FNBD), Group B (30 patients) – FNB, and Group C (30 patients) – FENT. Blinding was done by the concealed envelope technique. In Groups A and B, linear USG probe was used. Femoral block was given using 23-G spinal needle in plane. The location of needle tip was confirmed by injecting 2 mL of 5% dextrose. Drugs were given after achieving the correct needle position. Monitoring consisted of heart rate (HR), respiratory rate, non-invasive blood pressure (NIBP), and pulse oximetry. In Group A (FNBD), ultrasonography-guided FNB was given 5 min before positioning. 10 mL of 2% xylocaine with adrenaline (1:200000) and 10 mL of 0.5% bupivacaine plain with dexamethasone were used. In Group B (FNB), ultrasonography-directed FNB was given 5 min before positioning. 10 mL of 2% xylocaine with adrenaline (1:200000) and 10 mL of 0.5% bupivacaine plain were used. In Group C (FENT), patients were given injection fentanyl 1 µg/kg, 5 min before positioning. In the above three groups, pain score was evaluated by VAS after 5 and 15 min of femoral block or IV fentanyl.

In the above three groups, our aim was to achieve pain score <4. During positioning if any patient of either group complained of pain with VAS >or equal to 4, they were given IV fentanyl 0.5 µg/kg every 5 min till the pain score reduced to <4. Maximum dose of 3 µg/kg IV fentanyl was given (whichever first); patients were not included in the study if pain scores of <4 could not be achieved. Then spinal was given at L-2/3 or L-3/4 level. Pain scores before and during positioning were recorded. Pain scores were assessed using Visual Analog Scale (0=no pain, 10=maximal pain). IV fentanyl required during positioning, time taken to perform SA, and quality of positioning of the patient (0=not satisfactory, 1=satisfactory, 2=good, 3=optimal) were recorded. Monitoring of HR, mean arterial pressure (MAP) by NIBP, and oxygen saturation (SpO_2) was done.

In all the three groups, 100 mg IV tramadol was used as rescue analgesia and number of rescue analgesia was noted. Paracetamol 1 g IV was given 15 min before closure. Patients were shifted to post-anesthesia care unit after surgery and they were observed for VAS and requirement of recue analgesia. Any adverse effects such as local site reaction, formation of hematoma, local anesthesia toxicity due to intravascular injection of the LA like perioral numbness, tinnitus, dizziness, tingling, lethargy and seizures, and cardiovascular toxicity signs such as arrhythmias, atrioventricular conduction block myocardial depression were monitored. Postoperative nausea and vomiting was also monitored and treated with antiemetics. After 24 h, patients were asked the quality of pain relief by patient satisfaction scale. Parameters observed: Fracture site: Neck of femur, intertrochanter of femur, shaft of femur, time from trauma to surgery (days), VAS: VAS, time at which VAS was recorded, time taken to perform SA, quality of patient positioning, duration of analgesia, number of rescue analgesia required. Statistical analysis: MS Excel (R) Office 365 was used to analyze the data, and the Statistical Packages for the Social Sciences version 25. Continuous variables were analyzed using the Mann–Whitney test (independent group/unpaired data) and Wilcoxon sign-rank test (for paired data). Fisher exact test was used for the comparison of proportions (categorical variables). Independent multigroup analysis was done using one-way

Table 2: Demographic parameters

Demographic parameters	Group A (%)	Group B (%)	Group C (%)	p-value
Gender				
Male	73.33	80	73.33	0.7861
Female	26.667	20	26.66	
ASA grade				
Grade 1	66.66	73.33	70	
Grade 2	33.33	26.66	30	0.8532
Age (mean±SD)	44.07±9.61	45.6±11.14	46.1±9.68	0.723
Weight (mean±SD)	62.33 (5.54)	59.93 (4.96)	60.9 (5.33)	0.215

ASA: American Society of Anesthesiologists

ANOVA/Kruskal–Wallis test based on the normalcy of the data. $p<0.05$ was considered statistically significant.

RESULTS

There was no significant difference between groups in terms of gender distribution, age, weight, and ASA grade (Table 2).

The HR at baseline for the three groups was comparable with no significant difference (p=0.2685). The HR was significantly different at 15-min follow-up. The HR was lowest for Group C at 15 min (p<0.0001). However, the HR was not different in the subsequent follow-up period (Table 3).

The SpO_2 at baseline for the three groups was comparable with no significant difference (p=0.7127). The SpO_2 was significantly different at 15-min follow-up. The SpO_2 was lowest for Group C at 15 min (p=0.005). However, the SpO_2 was not different in the subsequent follow-up period (Table 4).

The MAP was significantly different at 15-min follow-up. The MAP was lowest for Group C at 15 min (p<0.0001) (Table 5).

Patients in Group C (3.667±0.844 min) had the highest time to perform SA followed by Group B patients (2.68±0.6687 min). Patients in Group A (2.03±0.72 min) had the lowest time to perform SA in minutes. This difference was statistically significant (p<0.0001) (Table 6).

The quality of patient positioning based on the anesthesiologist satisfaction score was highest in Group A patients (2.33±0.61) followed by Group B (2.13±0.63). The quality of patient positioning was lowest/poorest in Group C (1.03±0.67). The difference in quality of patient positioning was statistically significant (p<0.0001) (Table 7).

The VAS-based assessment of analgesia at baseline for the three groups was comparable with no significant difference (p=0.0.4244). The VAS-based assessment of analgesia was significantly different at 5-min (p<0.0001) and 15-min (p<0.0001) follow-up. The VAS-based assessment of analgesia was highest for Group C at 5 min and 15 min (p<0.0001) (Table 8).

The duration of analgesia was highest for Group A (19.60±1.54 h). Group C patients had the lowest duration of analgesia (2.93±0.7849 h). The difference was statistically significant (p<0.0001) (Table 9).

The highest number of rescue analgesia was used in Group C patients (3.37±0.4901) compared to Group A (0.83±0.379) and Group B (1.83±0.379). The difference was statistically significant (p<0.0001) (Table 10).

The highest patient satisfaction was seen in Group A with the proportion of patients with score 3 and score 4 highest compared to the other two groups. Lowest patient satisfaction was seen in Group C with most of the patients having score of 1 and 2. The difference was statistically significant (p<0.0001) (Table 11).

Table 3: Heart rate assessment

Heart rate	Group A	Group B	Group C	p-value*
Baseline	88.53±4.88	89.93±4.08	87.53±4.3	0.2685
15 min	86.20±5.9	84.33±5.8	79.11±4.96	<0.0001
30 min	85.50±3.05	83.33±2.19	81.32±2.15	0.6618
45 min	84.17±3.4	83.14±1.92	82.21±2.01	0.2268
60 min	83.37±7.61	82.73±5.86	82.38±7.92	0.5579
75 min	83.57±6.75	82.67±8.51	81.77±7.9	0.4604
90 min	77.90±2.63	75.67±2.17	75.67±2.17	0.9122
105 min	80.53±3.4	77.93±3.3	76.87±3.06	0.318
120 min	78.93±2.5	76.40±2.84	75.93±2.11	0.398

Table 4: SpO_2-related assessment

SpO_2 (%)	Group A	Group B	Group C	p-value*
Baseline	99.77±0.43	99.73±0.45	99.67±0.55	0.7127
15 min	98.63±0.49	97.26±0.38	96.31±0.5	0.005
30 min	99.01±0.38	98.80±0.41	98.10±0.01	0.04
45 min	98.97±0.18	98.97±0.18	98.93±0.25	0.3165
60 min	98.97±0.18	98.97±0.18	98.43±0.5	0.4129
75 min	98.97±0.18	98.97±0.18	98.50±0.51	0.6331
90 min	98.97±0.18	98.87±0.35	98.77±0.43	0.0754
105 min	98.90±0.31	98.60±0.5	98.90±0.31	0.3514
120 min	98.50±0.51	98.87±0.35	99.00±0	0.1667

Table 5: Mean arterial pressure

MAP	Group A	Group B	Group C	p-value*
Baseline	81.60±3.08	80.27±4.42	79.73±4.51	0.1912
15 min	77.07±2.56	76.13±3.01	72.73±1.93	<0.0001
30 min	76.27±2.72	75.80±2.31	74.60±2.02	0.3466
45 min	75.13±2.71	74.40±2.31	74.10±2.51	0.5217
60 min	75.07±2.77	73.73±2.39	72.39±2.52	0.6317
75 min	74.13±2.67	72.80±2.01	72.10±2.08	0.6378
90 min	73.07±2.15	72.07±2.32	71.10±2.29	0.2467
105 min	71.73±2.02	70.13±2.83	69.30±2.05	0.6304
120 min	70.33±2.17	69.40±1.9	68.21±1.13	0.8614

MAP: Mean arterial pressure

DISCUSSION

Fracture femur is usually seen after trauma in young and a small fall in the elderly [7]. SA is a routine technique used in the reduction of fracture femur. However, the most challenging task in the process is positioning of patients for SA [7]. Usually, patient positioning is needed to be performed before spinal, which requires large amount of IV analgesics. Different types of opioids and non-steroidal anti-inflammatory drugs are used [7].

Fentanyl is a lipophilic opioid which is used for positioning. It has cardiovascular stability even in ill patients. There is a direct concentration-effect relation between the fentanyl and respiratory depression [13]. FNB has been shown that it is an effective method

Table 6: Time to perform spinal anesthesia

Time to perform spinal anesthesia (minutes)	Group A	Group B	Group C	p-value A versus B	p-value B versus C	p-value A versus C
Mean±SD	2.03±0.72	2.68±0.67	3.67±0.84	0.0449	0.0021	<0.0001
Median	2.00	2.00	4.00			
Quartile 1	2.00	2.00	3.00			
Quartile 2	2.75	2.00	4.00			

Table 7: Quality of patient positioning among groups

Quality of patient positioning	Group A	Group B	Group C	p-value A versus B	p-value B versus C	p-value A versus C
Mean±SD	2.33±0.61	2.13±0.63	1.03±0.67	0.0955	0.0155	<0.0001
Median	2	2	1			
Quartile 1	2	2	1			
Quartile 2	3	2.75	1			

Table 8: VAS overall comparison

VAS	Group A	Group B	Group C	p-value*
Baseline	7.54±0.9	7.61±0.94	7.83±0.95	0.4244
5 min	2.93±0.52	3.87±0.73	4.73±0.52	<0.0001
15 min	0.70±0.65	1.53±0.51	2.73±0.45	<0.0001
30 min	0.60±0.5	0.70±0.47	0.63±0.49	0.7194
1 h	0.60±0.5	0.70±0.47	0.83±0.48	0.1937
2 h	0.87±0.43	0.93±0.25	1.01±0.35	0.6344
4 h	1.50±0.51	1.30±0.47	1.73±0.53	0.2934
6 h	1.73±0.52	1.83±0.59	1.99±0.61	0.9211
12 h	2.20±0.48	2.54±0.51	2.69±0.46	0.6237
18 h	3.03±1.07	3.11±1.02	3.59±1.33	0.3178
20 h	2.63±1.85	2.41±1.09	1.97±0.65	0.6159
22 h	1.43±1.07	1.29±0.43	0.90±0.38	0.9587
24 h	1.00±0.95	0.70±0.47	0.63±0.49	0.0851

VAS: Visual Analog Scale

Table 9: Duration of analgesia in hours

Duration of analgesia (hours)	Group A	Group B	Group C	p-value
Mean±SD	19.60±1.54	11.5±1.30	2.93±0.78	<0.0001*
Median	20.00	12	3	
Quartile 1	18.00	10	2	
Quartile 2	20.00	12	3.75	

p<0.0001 – means highly significant

Table 10: Total rescue analgesia

Total rescue analgesia	Group A	Group B	Group C	p-value
Mean±SD	0.83±0.37	1.83±0.37	3.37±0.49	<0.0001*
Median	1	2	3	
Quartile 1	1	2	3	
Quartile 2	1	2	4	

of providing better analgesia for positioning of subarachnoid block and post-operative analgesia in femur fracture surgery and also it can be used during pre-hospital and pre-operative pain management for fracture femur [8,14], considering these facts we are comparing between the FNB and fentanyl. Dexamethasone when added to a LAs, it appears that it prolongs the duration of the nerve block. The analgesic effects of SA and systemic corticosteroids that are combined with the LAs have proven to be more effective. These are the reasons to use it and test its benefits against others [15]. The use of ultrasound in the regional anesthesia recently has reduced the risk of nerve block related complications such as arterial puncture, in comparison to non-ultrasound techniques [15].

This study was conducted by us, in which we have compared the analgesic effects provided by FNBD, without dexamethasone and IV fentanyl, prior and during the positioning of patient for SA also which method took the least time to perform with the best ergonomics and duration of post-operative analgesia in terms of Visual Analog Scale, resulting in best overall satisfaction to patient and doctor. We have not found any study till now comparing the three groups.

Hsu *et al.* (2018) conducted a meta-analysis in which they found FNB give better analgesia for the positioning for spinal, mostly for patients who received SA in the sitting position. Patients who got FNB required less time for performing spinal, had lower analgesic requirements, had higher anesthesiologist satisfaction, better patient acceptance, and had no major hemodynamic instabilities [15].

In our study, the VAS-based assessment of analgesia was statistically significant at 5 min (p<0.0001), with mean VAS: Group A – 2.9333±0.5208, Group B – 3.8667±0.7303, Group C – 4.7333±0.5208. The mean VAS was lowest for Group A and highest for Group C. The VAS-based assessment of analgesia was statistically significant at 15 min (p<0.0001), with mean VAS: Group A – 0.7±0.6513, Group B – 1.5333±0.5074, Group C – 2.7333±0.4498. The mean VAS was lowest for Group A and highest for Group C. In our study, we added bupivacaine (which has longer duration of action) along with lignocaine for FNB. The onset of action with bupivacaine is slow so we observed VAS till 15 min before positioning the patient for spinal block. In our study, the patients in Group C had the highest time to perform SA with a mean of 3.667±0.844 min followed by Group B having mean of 2.68±0.6687 min, least in Group A with mean of 2.03±0.72 min. This difference is statistically significant with p<0.0001. The quality of patient positioning based on the anesthesiologist satisfaction score was seen highest in the Group A patients with mean of 2.33±0.61 followed by the Group B with mean of 2.13±0.63 and was poorest in the Group C with mean of 1.03±0.67. The difference in the quality of patient positioning was statistically significant with p<0.0001. Yet, another study also has compared FNB with IV fentanyl before positioning to perform SA in patients with femur fractures. They also found that the FNB decreases the time to perform SA and decreases the need for opioids [15] which we found to be supporting our findings.

We have calculated the duration of post-operative analgesia in our study by (measuring the time at which rescue analgesia was administered) when the VAS score was greater than or equal to 4. The mean duration of analgesia was observed highest for Group A (19.60±1.54 h), and in Group C, patients had the lowest duration of analgesia (2.93±0.7849 h). The difference is statistically significant (p<0.0001). Group B had 11.5±1.3065 h of analgesia which was significantly lower than Group A but higher than Group B. In our study, we also observed that the requirement of number of rescue analgesia doses was highest in Group C patients with mean of 3.37±0.4901 number of doses; in

Table 11: Patient satisfaction score

Patient satisfaction score based	Group A (n)	Group A (%)	Group B (n)	Group B (%)	Group C (n)	Group C (%)	p-value
Score 1	0	0	0	0	18	60	<0.0001*
Score 2	0	0	20	66.667	12	40	
Score 3	10	33.333	10	33.333	0	0	
Score 4	20	66.667	0	0	0	0	
Total	30	100	30	100	30	100	

p<0.0001 – means highly significant

Group B, we noted 1.83±0.379 doses; and least in Group A 0.83±0.379 doses. The difference was statistically significant with p<0.0001. At the end of our study, we calculated the average of the patient satisfaction score. The average score was highest in the Group A, suggestive of highest patient satisfaction compared to the other groups, a mean of 3.67±0.48 in Group A, 2.33±0.4795 in Group B, and 1.40±0.4983 in Group C which shows better acceptance of FNBD technique with better overall outcome, which we also found in the given studies. Purohit *et al.* observed that patient satisfaction scores were significantly higher in FNB group with score mean of 1.4952±0.033 as compared to non FNB group 0.3460±0.1786 [16]. There is low risk of vascular hematoma, nerve damage, infection, and intravascular infection with the use of FNB [17]. FNB is more efficacious than opioids alone for preventing pain in patients with femur fracture. This observation was done by comparison of scores which was then measured by different recognized scales [18-21].

On comparing the hemodynamic parameters in our study, we found that HR was significantly lower in Group C at 15 min after the FNB as compared to Group A and Group B, with p<0.0001. MAP was found to be significantly lower in Group C compared to Group A and Group B at 15 min after the femoral block with p<0.0001. On comparison of SpO_2 in all the groups at different time intervals, the SPO_2 was significantly lower in Group C as compared to Group A and Group B, at 15 min after the poisoning of the patient with p=0.005.

Singh *et al.* in their study compared FNB and IV fentanyl and assessed that none of the patients in both the groups had SpO_2 <90% during the procedure [1]. We found similar results in our study. In our study, both FNB and FNBD were better than IV fentanyl in terms of analgesia for patient positioning during SA and also for post-operative period. We found FNBD better than FNB as it provides longer duration of post-operative analgesia, better patient satisfaction, and lesser use of rescue analgesia.

CONCLUSION

From the above observations, we concluded that that FNB is safe, easy to perform without any hemodynamic instability and adverse effects. FNBD is a better analgesic compared to FNB without dexamethasone and IV fentanyl for positioning because the quality of patient positioning was better and the time required during spinal anesthesia in femoral fracture surgeries was found to be less in FNBD as compared to other two groups. Furthermore, the post-operative analgesic effect and patient satisfaction scores were better in FNBD.

Limitation of study

The small sample size of patients cannot be extrapolated to the entire population. Thereby, a large population-based studies are needed. The post-operative pain score was studied till 24 h only and static and dynamic pain scores were not evaluated separately.

ACKNOWLEDGMENT

Surabhi Wahi: Acquisition of data, writing manuscript, interpretation of data. Ranjita Acharya: Concept and designing, data collection, final approval. Sushree Das: Interpretation of data, writing the manuscript, final approval. Madhusmita Patro: Concept and designing, interpretation of data, final approval.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FINANCIAL SUPPORT

None.

REFERENCES

1. Singh AP, Kohli V, Bajwa SJ. Intravenous analgesia with opioids versus femoral nerve block with 0.2% ropivacaine as preemptive analgesic for fracture femur: A randomized comparative study. Anesth Essays Res. 2016 May-Aug;10(2):338-42. doi: 10.4103/0259-1162.176403, PMID 27212771
2. Duc TA. Postoperative pain control. In: Conroy JM, Dorman BH, editors. Anesthesia for Orthopedic Surgery. New York: Raven Press; 1994. p. 355-65.
3. Parker MJ, Handoll HH, Griffiths R. Anaesthesia for hip fracture surgery in adults. Cochrane Database Syst Rev. 2004;4(4):CD000521. doi: 10.1002/14651858.CD000521.pub2, PMID 15494999
4. Foss NB, Kristensen MT, Palm H, Kehlet H. Postoperative pain after hip fracture is procedure specific. Br J Anaesth. 2009;102(1):111-6. doi: 10.1093/bja/aen345, PMID 19059921
5. Cuvillon P, Ripart J, Debureaux S, Boisson C, Veyrat E, Mahamat A, *et al*. Analgesia after hip fracture repair in elderly patients: The effect of a continuous femoral nerve block: A prospective and randomised study. Ann Fr Anesth Reanim. 2007;26(1):2-9. doi: 10.1016/j.annfar.2006.06.025, PMID 17142005
6. National Institute for Health and Care Excellence. The Management of Hip Fracture in Adults. National Clinical Guideline Centre; 2011. Available from: https://www.nice.org.uk/guidance/cg124 [Last accessed on 2020 Jun 27].
7. Gopal ND, Krishnamurthy D. A clinical comparative study of fascia iliaca compartment block with bupivacaine and bupivacaine with dexmedetomidine for positioning and duration of postoperative analgesia in fracture femur under spinal anesthesia. Anesth Essays Res. 2018;12(2):528-34. doi: 10.4103/aer.AER_56_18, PMID 29962629
8. Parker MJ, Griffiths R, Appadu BN. Nerve blocks (subcostal, lateral cutaneous, femoral, triple, psoas) for hip fractures. Cochrane Database Syst Rev. 2002;1:CD001159.
9. Foss NB, Kristensen BB, Bundgaard M, Bak M, Heiring C, Virkelyst C, *et al*. Fascia iliaca compartment blockade for acute pain control in hip fracture patients: A randomized, placebo-controlled trial. Anesthesiology. 2007;106(4):773-8. doi: 10.1097/01.anes.0000264764.56544.d2, PMID 17413915
10. Lil CN, Gajjar HR, Shah A, Shah A, Ramani Y, Patel I. Usefulness of fascia iliaca compartment block with injection bupivacaine and dexamethasone as adjuvant in patients undergoing hip fracture surgeries under spinal anesthesia. Asian J Pharm Clin Res. 2023 Nov;16(11):45-7. doi: 10.22159/ajpcr.2023.v16i11.48278
11. Jain N, Mathur PR, Patodi V, Singh S. A comparative study of ultrasound-guided femoral nerve block versus fascia iliaca compartment block in patients with fracture femur for reducing pain associated with positioning for subarachnoid block. Indian J Pain. 2018;32:1504.
12. Forouzan A, Masoumi K, Motamed H, Gousheh MR, Rohani A. Nerve Stimulator versus Ultrasound-Guided femoral nerve Block; a randomized clinical trial. Emergency. 2017;5(1):e54. PMID 28286861
13. Hartmann FV, Novaes MR, Carvalho MR. Femoral nerve block versus intravenous fentanyl in adult patients withhip fractures - a systematic review. Rev Bras Anestesiol. 2017;67(1):67-71.
14. Schiferer A, Gore C, Gorove L, Lang T, Steinlechner B, Zimpfer M, *et al*. A randomized controlled trial of femoral nerve blockade administered preclinically for pain relief in femoral trauma. Anesth Analg. 2007;105(6):1852-4. doi: 10.1213/01.ane.0000287676.39323.9e,

PMID 18042893
15. Hsu YP, Hsu CW, Chu KC, Huang WC, Bai CH, Huang CJ, *et al*. Efficacy andsafety of femoral nerve block for the positioning offemur fracture patients before a spinal block - asystematic review and meta-analysis. PLOS One. 2019;14(5):e0216337. doi: 10.1371/journal.pone.0216337, PMID 31048897
16. Purohit S, Ejjapuredi S, Badami RN. Positioning for regional anesthesia in femur fracture surgeries: How effective is femoral nerve block? A randomised control study. Int J Res Med Sci. 2017;5(8):3590-5. doi: 10.18203/2320-6012.ijrms20173568
17. Lopez S, Gros T, Bernard N, Plasse C, Capdevila X. Fascia iliaca compartment block for femoral bone fractures in prehospital care. Reg Anesth Pain Med. 2003;28(3):203-7. doi: 10.1053/rapm.2003.50134, PMID 12772137
18. Mittal R, Vermani E. Femoral nerve blocks in fractures of femur: Variation in the current UK practice and a review of the literature. Emerg Med J. 2014;31(2):143-7. doi: 10.1136/emermed-2012-201546, PMID 23444420
19. Pennington N, Gadd RJ, Green N, Loughenbury PR. A national survey of acute hospitals in England on their current practice in the use of femoral nerve blocks when splinting femoral fractures. Injury. 2012;43(6):843-5. doi: 10.1016/j.injury.2011.10.003, PMID 22029946
20. Black KJ, Bevan CA, Murphy NG, Howard JJ. Nerve blocks for initial pain management of femoral fractures in children [review]. Cochrane Database Syst Rev. 2013;17(12):CD009587. doi: 10.1002/14651858.CD009587.pub2, PMID 24343768
21. Vardanyan RS, Hruby VJ. Fentanyl-related compounds and derivatives: Current status and future prospects for pharmaceutical applications. Future Med Chem. 2014;6(4):385-412. doi: 10.4155/fmc.13.215, PMID 24635521