



COMPARISON OF FASCIA ILIACA COMPARTMENT BLOCK VERSUS ULTRASOUND GUIDED FEMORAL NERVE BLOCK FOR PROXIMAL FEMUR FRACTURES

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ABSTRACT

Background: Adequate postoperative analgesia facilitates early mobilization which is important to reduce postoperative morbidity. Here, we intended to compare the efficacy of two different nerve blocks for postoperative pain relief in fractured neck of femur patients

Aim of the Study: The aim of this study was to compare the overall efficacy of the post operative analgesia of fascia iliaca compartment block (FICB) and femoral nerve block (FNB) in patients with proximal femur fracture

Methods: Sixty patients of proximal femoral fractures were randomly allocated to two groups (30 in each group). At the end of surgery, group A received femoral nerve block (FNB) and group B received fascia iliaca compartment block (FICB) for postoperative pain relief. These blocks were ultrasound guided. Patients' pain was evaluated by Visual Analogue Scale (VAS). Duration and Rescue of analgesia timing was recorded in all patients.

Results: Majority of the patients were above 60 years male with normal BMI, no significant difference between both the groups in respect to age distribution, gender, BMI and ASA grade ($p > 0.05$). There was no statistically significant difference in both groups with respect to VAS score for pain. Duration of analgesia was 12 hours, but no significant difference in duration and rescue of analgesia in FICB and FNB.

Conclusion: USG guided FICB can be an effective alternative to femoral nerve block, because of its relative simplicity in technique and less invasiveness, but no statistically difference between them in respect of VAS pain score, duration and rescue of analgesia.

Key words: Proximal femur fracture, FICB, FNB, VAS score

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INTRODUCTION

The fractures of the proximal femur, including the fracture of the neck of femur, intertrochanteric, and subtrochanteric fractures, are a common orthopedic emergency, especially in the geriatric population. These fractures are extremely painful and associated with significant morbidity and mortality [1-2]. Fractured neck of femur occurs most commonly in elderly individuals as a result of minimal trauma and fall from height. It is a common cause of admission to hospital and requires operative fixation [3-4]. Numerous studies have shown that hip arthroplasty can cause severe pain in the Perioperative period, which can lead to a series of related complications, which not only increases the Perioperative risk but also is detrimental to the long-term prognosis of patients. Fore, an optimal Perioperative analgesia can greatly facilitate the patient's postoperative recovery [5]. Peripheral nerve blocks are localized and site-specific. Nerves and neural plexus blocks are efficient and depending upon the surgery, an alternative choice for postoperative analgesia [6].

Femoral nerve block (FNB) is effective in providing analgesia for femur fractures [7]. A fascia iliaca compartment block (FICB) is a modification of the femoral nerve block. It is performed by application of local anaesthetic beneath the fascia iliaca and provides a block of femoral nerve and lateral femoral cutaneous nerve and rarely of obturator nerve [8-9].

The use of ultrasonography in anesthesia has helped the anesthetist to see the nerve, needle, and the distribution of the drug, thereby enhancing the chances of a favorable outcome of the nerve block [10]. Ultrasound-guided blocks have become shortened time for the onset of sensory block, decreased performance time, and lower drug doses [11]

Aim & objective: To study the efficacy of ultrasound guided femoral nerve block and Fascia iliaca block technique as postoperative analgesia in patients of proximal femur fracture

MATERIALS AND METHODS:

This Prospective Randomised clinical study was conducted in the department of Anaesthesiology in Institute of Anaesthesiology and Critical Care, Madras Medical College, Chennai, from September 2019 to April 2020 (08 months duration)

60 patients presenting for proximal femur fracture surgeries were enrolled in our study and randomly assigned to two groups (30 in each group);

Group A—Ultrasound guided femoral nerve block using 40ml of 0.25% Bupivacaine

Group B—Ultrasound guided fascia iliaca block using 40ml of 0.25% Bupivacaine

Inclusion criteria:

- Age group of 15-65 years patients
- ASA PS I, II
- Elective surgery
- Patients who have given valid informed consent

Exclusion criteria:

- Not satisfying inclusion criteria
- Patient refusal

- Skin and soft tissue infection over the injection site
- Bleeding disorders and coagulation abnormalities
- Duration of surgery more than 3 hours (cases which need conversion to general anaesthesia)
- Kyphoscoliosis
- Allergy to drugs used
- Patients with severe cardiovascular, endocrine, respiratory, hepatic and psychiatric diseases.
- BMI more than 35

All patients were shifted inside the operation theatre and ASA standard monitors (ECG, Non-invasive blood pressure, pulse oximetry) were connected. Baseline heart rate, oxygen saturation, means arterial pressure was recorded.

Patients were positioned supine in the operating table and the operating limb was cleaned using a sterile antiseptic iodine solution and draped using sterile towel.

Patients in group A received ultrasound guided femoral nerve block with 40ml 0.25% bupivacaine.

Patients in Group B received ultrasound guided fascia iliaca compartment block with 40ml of 0.25% bupivacaine

Vitals – heart rate, oxygen saturation, mean arterial pressure, VAS were recorded at zero time, 5 minutes,15 minutes,30 minutes,1st hour,4th hour,6th hour,8th hour,12th hour,16th hour and 24th hour.

Duration of postoperative analgesia is defined as time interval between 0 minute in postoperative period and time at VAS more than or equal to 4. Patients with VAS more

than or equal to 4 have received rescue analgesics. In this study, intramuscular diclofenac was given as rescue analgesia.

Statistical analysis: Data was analysed by using a SPSS ver. 17.0 (SPSS Inc., Chicago, IL), analysis student unpaired t-test, student paired test, and chi-square test. P values less than 0.05 were considered as significant.

RESULTS:

A total of 60 patients randomly divided into two groups (30 in each group) were analysed. The socio-demographic variables between two groups are compared in table: 1. In both the groups majority of the cases were above 60 years of age and statistically insignificant with respect to the age distribution ($P > 0.05$). Majority of the cases were male in both the groups, but statistically not significant ($p > 0.05$). Both the groups indicated that majority cases had normal weight, statistically insignificant with respect to the BMI distribution ($p > 0.05$). Majority of the cases belonged to ASA II in both the groups, not significant difference observed ($p > 0.05$).

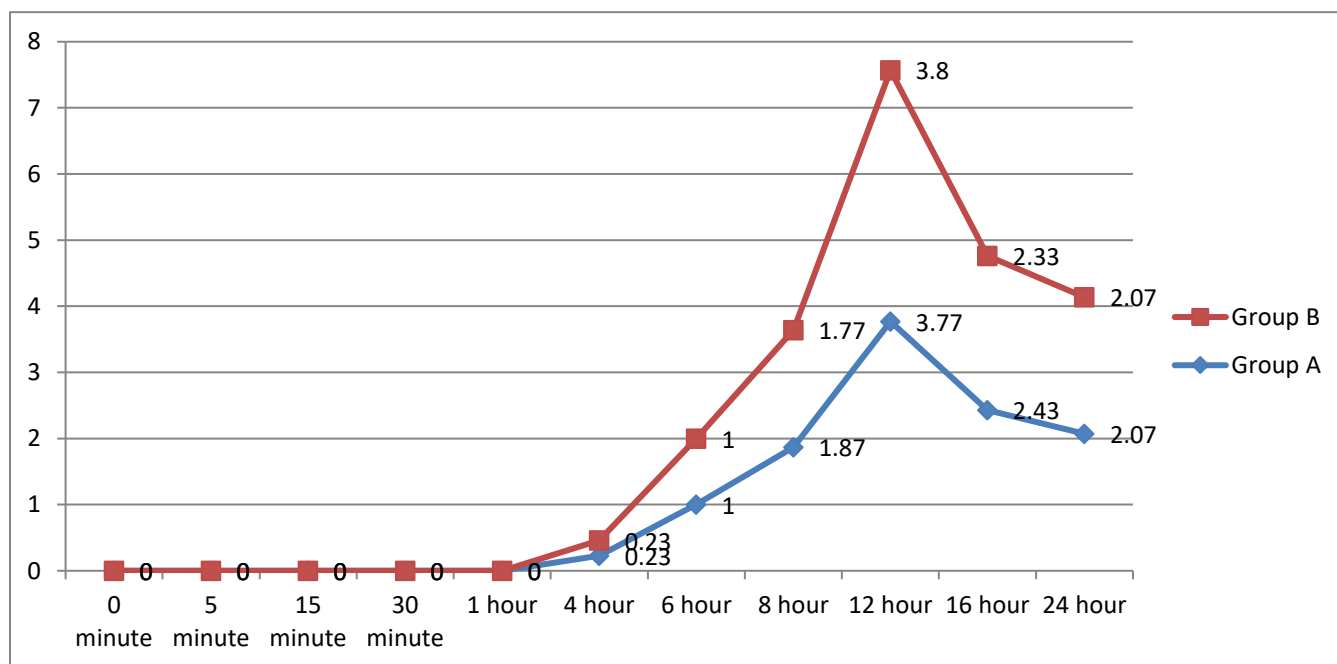
Table 1: Socio-demographic characteristics of the study participants

Characteristics		Group A	Group B	P value
Age group	< 30 Years	3 (10%)	1 (3.3%)	0.438
	31 - 45 Years	7 (23.3%)	3 (10%)	
	31 - 45 Years	8 (26.7%)	12 (40%)	
	> 60 Years	12 (40%)	14 (40.7%)	
Gender	Male	18 (60%)	20 (66.7%)	0.253
	Female	12 (40%)	10 (33.3%)	
BMI	< 24.99	25 (83.3%)	22 (73.3%)	

	25 – 29.9	5 (16.7%)	7 (23.3%)	0.336
	30 – 34.5	0 (00%)	1(3.6%)	
ASA	ASA I	14 (46.7%)	13 (43.3%)	0.961
	ASA II	16 (53.3%)	17 (56.7%)	

Figure 2 explains the visual analogue score at different time periods such as 0 minutes, 5 minutes, 15 minutes, 30 minutes, 1 Hour, 4 Hours, 6 Hours, 8 Hours, 12 Hours, 16 Hours & 24 Hours, both the groups were statistically insignificant with respect to the VAS score distribution ($P > 0.05$).

Figure 1: Comparison of Visual Analogue Score distribution among both the groups



The duration and rescue timing of analgesia between both the groups are represented in Table 2. 12 hours as the duration of analgesia found in majority of the cases in the both the groups, both the groups were statistically insignificant with respect duration and rescue timing of analgesia ($p > 0.05$).

Table 2: Comparison of duration and rescue timing of analgesia among both groups

Analgesia comparison		Group A	Group B	
		N (%)	N (%)	
Duration of Analgesia	8 hours	2 (6.7%)	1 (3.3%)	0.937
	12 hours	23 (76.6%)	25 (83.3%)	
	16 hours	5 (16.7%)	4 (13.4%)	
Time of 1st requirement of Analgesia	8 hours	2 (6.7%)	1 (3.3%)	0.514
	12 hours	23 (76.6%)	25 (83.3%)	
	16 hours	5 (16.7%)	4 (13.4%)	

DISCUSSION

Peripheral nerve blocks not only provide excellent analgesia, they also reduce postoperative inflammatory response. Various meta-analyses have been conducted on the role of different nerve blocks for postoperative analgesia in lower limb surgeries. However, most of them focused on the femoral nerve block [12-13].

In our study majority of the patients were >60 years, predominantly male with normal weight (BMI < 24.99) and belonged to ASA grade II. Statistically no significant difference between both the groups in respect to age distribution, gender, BMI and ASA grade ($p > 0.05$), our results are similar with the study conducted by Shukla U et al [14] and Krishnamurty, P et al [15].

Theoretically, FICB should provide better postoperative analgesia than FNB, as it blocks lateral femoral Cutaneous nerve along with femoral nerve, but several investigations have shown them to be equally effective [16-17].

Present study compared FICB and FNB for postoperative analgesia in patients undergoing

proximal femur surgery, we found that no statistically significant difference ($p > 0.05$) in pain intensity among these two blocks, this is consistent with many other studies results like Farid et al [18], and Gupta K et al [19], whereas Williams et al. [20] and Groot et al. [21], in their respective studies, showed that FICB was better as compared to intravenous analgesics. Sia et al. [22], in their study, concluded that the FNB given with the aid of a peripheral nerve stimulator, with 15 mL of 1.5% lignocaine, was successful at achieving a VAS score of 0.5 ± 0.5 , 5 minutes after local anesthetic was dispensed, for spinal anesthesia positioning, as compared to an intravenous fentanyl group which had a VAS score of 3.3 ± 1.4 .

In our study, we compared femoral nerve block with fascia iliaca block as postoperative analgesia and found out the mean duration of analgesia last upto 12 hours, whereas Shankar et al [23], observed mean duration of analgesia was only 8 hours.

The FIB has been considered relatively safe and easy to perform in various studies and can be preferred over the FNB [24-25]

CONCLUSION

We conclude that ultrasound guided femoral nerve block and fascia iliaca block had no statistical difference in terms of duration of analgesia, postoperative hemodynamic, postoperative visual analogue score and amount of rescue analgesic requirement.

FICB can be an effective alternative to femoral nerve block, because of its relative simplicity in technique and less invasiveness.

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