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USG Guided Femoral Nerve Block for Fracture Femur to Make the Patient Sit Comfortably for Spinal Anaesthesia

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Abstract

Background: Femoral nerve block (FNB) is an option for pain management in patients with femur fractures. *Aim*: Compare the analgesic effects of femoral nerve block (FNB) with intravenous (IV) fentanyl prior to positioning patients with fractured femur for spinal block. *Materials and Methods*: It is randomized prospective study was undertaken at for a period of 9 months. Total 50 Subjects participated in study, divided into 2 groups, Group-L(lignocaine) 25 patients received 20 ml of 1% lignocaine around femoral nerve under ultrasound guidance and in plane approach. Group-F(Fentanyl)-25 patients received 1 mic/kg of fentanyl intravenously. *Results*: All the demographic details are not significant in both the groups. Mean arterial pressure is significantly decreased (p-value<0.05) during positing in group F and there is significantly decreased O2 saturation in patients also.Pain score during positioning is decreased significantly in group-L. Out of 25 patients in Group L, 22 were found satisfactory with this method. *Conclusion*: Femoral nerve block provides better analgesia, patient satisfaction, less time for anaesthesia and satisfactory positioning.

Keywords: Femoral Nerve Block; Lignocaine; Fentanyl.

Introduction

Hip fractures remain one of the most serious injuries that occur in older people, with a mortality rate of 10% at one month, 20% at four months and 30% at one year . Many of those who recover suffer a loss in mobility and independence. Approximately half of patients who were previously functionally independent become partly dependent, while one third become totally dependent [1]. The mean age of these patients is 81 years, 75% are female, and they are one the frailest groups of patients to be admitted to hospital, commonly with multiple co-morbidities. Hip fractures are painful in both the pre and postoperative period [2]. Adequate treatment of pain is not only a humanitarian issue, but may also impact on recovery. Pain is associated with increased neuro-hormonal stress response, myocardial ischemia, and delayed mobilization, all of which may increase postoperative length of stay and are associated with increased postoperative mortality. Untreated pain is also associated with delirium .

Positioning of these patients is with severe pain during movement. Inability to effectively control pain prior to the procedure increases patient's neuro-hormonal stress response, and may also lead to suboptimal position for the procedure. A good analgesia prior toblock for a patient with femur fracture will allow the anaesthesiologist to position his patient optimally [3]. An optimum patient positioning leads to higher success rate of the procedure and provide great patient and clinicians comfort. Current methods of providing analgesia are systemic NSAIDs and opioids, or peripheral nerve block like femoral nerve block or fascia iliaca plane block. Femoral nerve block is comparatively easy to

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perform and ultrasound guidance would promote preciseness, also avoid the need of quadriceps twitching by nerve stimulator which would otherwise be painful for a patient with femur fracture. We conducted this study to compare the analgesic effect provided by femoral nerve block (FNB) and intravenous (IV) fentanyl prior to positioning for central neuraxial block in patients undergoing surgery for femur fracture.

Materials and Methods

This randomized prospective study was conducted between April 2015 – December 2015. Institutional ethical clearance was obtained.

Inclusion Criteria

ASA-I and II, age group 18-75 years undergoing surgery for femur fracture and who were unable to sit.

Exclusion Criteria

Bleeding diathesis, allergy to local anaesthetics, polytrauma, inability to rate pain score by any reason, use of analgesics 6 hours prior to surgery, BMI>30kg/m^2 Patient were selected by randomizedtechnique to either femoral nerve block or intravenous fentanyl group. Total 50 Subjects participated in study, divided into 2 groups, Group-L(lignocaine) 25 patients received 20 ml of 1% lignocaine around femoral nerve under ultrasound guidance and in plane approach. Group-F(Fentanyl)-25 patients received 1 mic/kg of fentanyl intravenously.

All patients were evaluated for preanaesthetic checkup the evening before surgery and informed consent obtained. Once patient was shifted to operation room, IV line was secured and monitors attached. Vital signs and Visual Analogue Pain Scale (VAS- 0=no pain, 10=maximal pain) at this time was noted as baseline value.Group L patients received femoral nerve block under ultrasound guidance using 20G IV Cannula after skin infiltration with 4ml of 1% lignocaine and 20ml ofof 1% lignocaine around femoral nerve. Group-F (Fentanyl)-25 patients received 1 mic/kg of fentanyl intravenously.

After five and tenminutes VAS score was assessed. Patient is kept in lateral position after 10 minutes.VAS on positioning was documented and compared between the two groups. Spinal block was performed in either the midline or paramedian approach at the L2/3 or L3/4 level, according to the anaesthesiologists' decision. Pain scores before and during positioning were recorded. Pain assessment was done using visual analogue scale (0 = no pain, 10 = maximal pain). Satisfaction with patient position maintained for spinal block and patient satisfaction, e.g., like or dislike (yes or no) were also recorded.

Results

Prospective randomized study done for a period of 9 months in total 50 subjects with femoral fracture came for surgery.

Table 1: Demographic details in study

Characteristics	Group-L	Group-F	P-value
Age(Years)	64 ± 16.2	65.1±14.4	>0.05
Sex			
Males	12	13	>0.05
Females	13	12	>0.05
Weight	57.1±8.2	56.3±8.8	>0.05
ASA Physical Status			
I	4	5	>0.05
II	11	10	
III	10	10	
Fracture Site			
Neck	15	14	>0.05
Intertrochanteric	6	7	
Shaft	3	4	
Distal Part Of Femur	1	0	

All the demographic details are not significant in both the groups ie>0.05(insignificant)

Table 2: Details of surgery and vital parameters

	Group-L	Group-F	P-value
Time from trauma to surgery (days)	8±3	9±4	>0.05
Type of surgery			
Hemiarthroplasty	15	14	>0.05
Dynamic hip screw	6	8	
Others(Knail,etc)	4	3	
Vital parameters			
MAP before positioning	88.3±7.2	84.5±8.2	0.07
MAP during positioning	89.1±6.8	83.5±6.9	<0.001*
HR before positioning	77.4±4.1	77.9±3.8	0.79
HR during positioning	77.3±3.9	77.8±4.2	0.72
SpO2 before positioning	98.03±0.89	98.1±0.9	1
SpO2 after positioning	98.0±0.11	95.03±0.7	<0.01*
Pain scores			
Pain score 10 min after analgesia	2.8+2.2	3.1+2.1	0.41
pain scores during positioning	4.1+3.2	6.4+2.2	<0.05

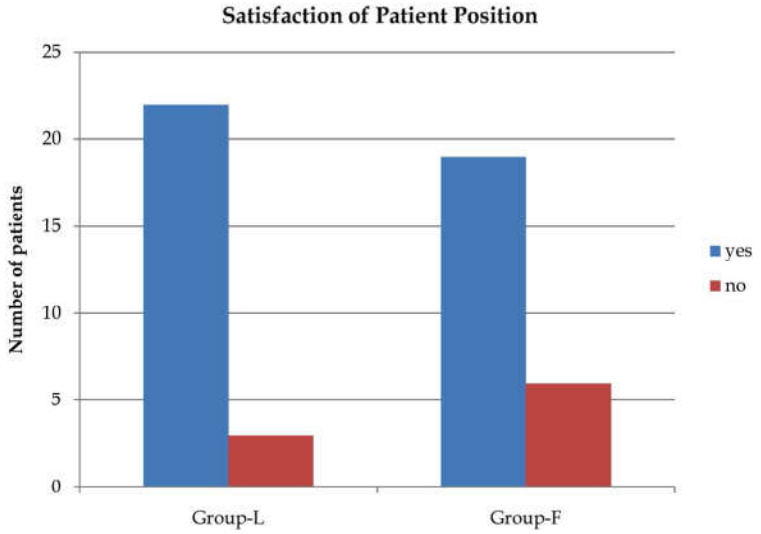

Table 3: Satisfaction of patient position

From the above table mean arterial pressure was significantly(p-value<0.05)decreased during positing in group F and also there was significant decreased O2 saturation in these patients.

Pain score during positioning is decreased significantly in group-L .

From above bar diagram there are 22 patients with using 1% lignocaine around femoral nerve under ultrasound guidance found satisfactory with this method.

Discussion

Over the past few years, the numbers of elderly patients who have multiple comorbidities presenting with fractured femur have been increasing. As a result, surgical repair which requires anesthesia has also increased. Urwinet al [4] reported that there were marginal advantages for regional anesthesia (RA) compared with GA in terms of one-month mortality and deep vein thrombosis. Sorenson et al [5] reported that the risk of deep vein thrombosis was greater for patients receiving GA. Haddad FS [6] also described femoral nerve block as effective analgesia for femur fracture. Many other studies have successfully used fascia iliaca compartment block for acute pain relief in hip fracture patients [7,8]. However, the choice of anesthetic technique depends on the anesthesiologist's preference and experience. At our institution, spinal block was used more frequently than GA for surgical repair of fractured femur. The subsequent problem concerned was pain on positioning for spinal block.

When considering the technique used to aid positioning patients for spinal block, Schifereret al [9] demonstrated that femoral nerve block provided analgesia after femoral trauma which was adequate for patient transport. Other studies have described the successful use of femoral nerve block as analgesia [10]. Parker et al [11] reported that nerve blocks reduced pain score and analgesic requirements. However, few studies have investigated femoral nerve block to facilitate positioning during conduct of regional anesthesia. Gosavi et al [12] assessed pain during change of position from supine to sitting after femoral nerve block with lidocaine; VAS scores were 2.7 ± 1.1. Siaet al [13] compared IV fentanyl with femoral nerve block using lidocaine. VAS values during placement in the sitting position were lower in the femoral nerve block group (0.5 ± 0.5 versus 3.3 ± 1.4 for FNB and IV fentanyl, respectively). Mosaffaet al [14] compared IV fentanyl with fascia iliaca block using lidocaine. VAS values during placement in the lateral decubitus position were lower in the fascia iliaca block group [0.5 (0–1) versus 4 (2–6) for fascia iliaca block and IV fentanyl, respectively]. In present study pain score is decreased significantly in Femoral nerve block patients (Group-L - mean±SD is 4.1±3.2: Group-F -mean±SD is 6.4±2.2) compared to Fentanyl group and also satisifaction of patient is also more in femoral nerve block patients when compared to other group (Figure 1).

In present study, vitals were more stable with a stable oxygen saturation in the group L and was also able to establish a better pain management with femoral nerve block with goodsatisfaction score and quality of patient positing is more in the femoral nerve block patients. Ranjit S et al [15] reported a significant difference in pain scores as well as quality of patient positioning and duration of subarachnoid block. Reddy DE et al [16] study demonstrated superiority of femoral nerve block over IV opioids for positioning patients with proximal femur fracture. A similar study done by Jadon et al [17] also reported lesser VAS scores, better patient positioning and faster time for anaesthesia with femoral nerve block than with IV fentanyl. Studies comparing other forms of regional analgesia with IV opioids for pain control also reveals better oxygen saturations with regional analgesia [18,19]. Vats A et al. however did not experience desaturation in the fentanyl group in their study [20].

Conclusion

Femoral nerve block provides better analgesia, patient satisfaction, less time for anaesthesia and satisfactory positioning than IV fentanyl for central neuraxial block in patients undergoing surgery for femur fractures.

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