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Research Paper

Femoral Nerve block for Positioning during Regional Anaesthesia in Patients with Fracture femur: A randomized controlled study.

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ABSTRACT:- Background: This study has been done to evaluate the usefulness of femoral nerve block (FNB) for positioning during regional anaesthesia in patients with femur fracture.
Method: 60 patients between the age group of 30 to 80 years, of ASA grade I, II and III, scheduled for elective surgeries of femur fracture were evaluated in 2 groups. Grp.FNB received femoral nerve block with 15ml of 1.5% lignocaine and Group. NB was not given any block. Assessment of pain before and after performing femoral nerve block was done by VAS score along with assessment of performance time and quality of patient's positioning during regional anaesthesia.
Results: 60 % of patients receiving FNB showed the VAS score of 1.4 $\pm$ 0.498 while 40% had VAS score of 4.03 $\pm$ 0.32 in Group NB and good pain relief for positioning for combined spinal epidural (CSE) in Group FNB and lesser performance time(16.2 $\pm$ 2.7 min) in comparison to patients not receiving nerve block it was (19.23 $\pm$ 2.674 min).
The data analysed for quality of positioning observed in FNB group 2.10 $\pm$ 0.305,
While in NB group it was1.13 $\pm$ 0.346

Conclusion: Femoral nerve block is not only effective in reducing pain during procedure but also decreases the performance time and gives better quality of positioning during regional anaesthesia for patients with fracture femur. It requires few instructions and aids in teaching the post graduate trainees with minimal discomfort to patients.

Keywords:- Femoral Nerve Block, positioning during regional anaesthesia, femur fracture.

I. INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Fracture femur is a painful bone injury usually occurs in elderly patients leading to considerable morbidity. Any overriding of fracture end is extremely painful and needs immediate attention and pain relief in the form of either systemic analgesics or femoral nerve block.[1] Thus, adequate pain relief in these patients not only increases the comfort but it also has been shown to improve positioning for regional anaesthesia. Eg. Spinal or Combined spinal epidural anaesthesia.

II. MATERIAL AND METHODS

After the approval of institutional ethics committee and with informed consent, the study was conducted in an attached hospital since May 2009 to July 2011.

60 patients of both sexes with age group between 30 to 80 years of ASA I, II and III scheduled for elective surgeries of fracture femur were included. We excluded the patients with coagulation disorders, mental disorders patients who are uncooperative, hypersensitive to amide local anaesthetics, local skin infections, patients on chronic analgesic treatment and presence of prosthetic femoral artery graft.
The patients were randomly divided into two groups of 30 each;
Group .FNB : Femoral Nerve Block given
Group . NB : No Femoral Nerve block

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All the patients with group FNB were counseled and explained the procedure of block as well as explained the scoring of VAS (Visual analogue score) i.e. 0- No Pain to 10 –worst Pain.[2]
Intravenous access was obtained with 18 no. cannula and standard monitoring done i.e. ECG,NIBP,SPO2. Premedication with IV ondansetron 4mg and all the patients were preloaded with 10-15ml/kg of Ringer's Lactate solution.
Group FNB patients received femoral nerve block using peripheral nerve locator (INNERV TOR252). The contractions of quadriceps femoris muscle with the cephalic movement at patella with 0.4 mA current were elicitated. 15ml of 1.5% lignocaine was injected slowly after aspiration and confirmation of correct placement. Group NB did not receive any block for positioning of regional block.

Assessment of pain before and after the FNB with the help of VAS score was noted. Performance time defined as the time from the beginning of patient positioning up to the end of regional technique was measured.[3]
The quality of patient's positioning during CSE (combined spinal epidural) was graded according to this scale (1- satisfactory, 2-good, 3-optimal) and was recorded. The patient's acceptance was recorded 24 hours after the surgery as average/good/optimal.

After the CSE block level of sensory block was tested with pin prick every 1 min for 20 min and motor block was assessed by Bromage scale.
The haemodynamic monitoring was done during the regional technique for first 20 mins during the CSE technique and throughout the procedure till the patient was shifted to post operative room. Patient's acceptance was noted 24 hours post operatively and graded as average/good/optimal.

III. OBSERVATIONS AND RESULTS

Demographic data was not significantly different between the groups except that more than 50% of the patients in both the groups were above the age of 70 years. Sex distribution and ASA grading were comparable in both the groups and were statistically not significant.
In our study, VAS values for positioning in FNB group 1.4 $\pm$ 0.498 as compared to NB group as 4.03 $\pm$ 0.32.
The quality of patient positioning was 2.10 $\pm$ 0.308 in FNB while 1.13 $\pm$ 0.346 in NB group which were statistically highly significant.
The time required for CSE was 16.23 $\pm$ 2.788 (min) in group FNB while in NB group it was 19.23 $\pm$ 2.674(min) and was statistically significant.

Patient's acceptance was noted 24 hours post operatively by simple grading as described in materials and methods and was observed that 80% of the subjects in group FNB had good pain relief after the block for positioning but other group had painful experience for positioning. The haemodynamic monitoring was performed throughout the procedure and was stable in both the study groups. The respiratory parameters in the form of SpO_2 and respiratory rate were monitored and no significant abnormality observed.
None of our patients had any systemic complications related to drugs/procedure.

Table 1. Statistical comparison of FNB to NB group.

Parameters	Group FNB Mean $\pm$ Sd	Group NB Mean $\pm$ Sd	Z - value P - value
Positioning VAS	1.4 + 0.498	4.03 $\pm$ 0.32	- 24.360 0.0001**
Quality of patient positioning	2.10 $\pm$ 0.305	1.13 $\pm$ 0.346	- 11.482 0.0001**
Time required for CSE (minutes)	16.23 $\pm$ 2.788	19.23 $\pm$ 2.674	- 4.254 0.0001**

FNB: Femoral nerve block, NB: No block, VAS: Visual Analogue Scale, Sd: Standard deviation.
* Significant level at 0.05, ** Significant level at 0.01

Table 2.Distrbution of patient's acceptance in study groups

Grade	Group FNB No of patients	Group NB No of patients
No Effect - 0	0	30
Average - 1	3	0
Good - 2	24	0
Optima l- 3	3	0

IV. DISCUSSION

This prospective study shows that femoral nerve block is effective in facilitating sitting position for combined spinal epidural (CSE) anaesthesia technique in fracture femur case.

Fracture femur is a significant cause of morbidity in elderly patients. Surgical correction is usually conducted under regional anaesthesia . However, any movement at the fracture site leads to severe pain[3]. Thus, providing adequate pain relief with femoral nerve block for positioning during regional anaesthesia adds to comfort level of the patients and reduces the time required for the technique.

Femoral nerve block has been successfully used in adults for femoral shaft fracture analgesia in pre hospital care or in emergency department. The fascia iliaca compartment block which produced by femoral nerve block and lateral femoral cutaneous nerve block provided good pain relief for the patients with femur neck fracture used in pre-hospital care.[4]

We studied the analgesic effect of femoral nerve block to ensure proper positioning for regional techniques of CSE. Regarding techniques used to aid to positioning of patients for spinal anaesthesia; Sandby Thomus reported that most frequently used agents were midazolam, ketamine and propofol; while alternative agents were fentanyl, remifentanyl, morphine, N_2O and sevoflurane; Whereas nerve blocks were used very rarely.[5] But these above pharmacological interventions do have their limitations as most of the patients are elderly with co-morbid conditions.

Parker *et al* reported that femoral nerve block reduced the pain score and analgesic requirements.[6] However, very few studies have investigated femoral nerve block for positioning during conduct of regional anaesthesia.

Gosavi *et al* assessed pain score during change of position from supine to sitting after femoral nerve block with lidocaine.[7] Sia *et al*. compared IV fentanyl with femoral nerve block with lidocaine. The VAS score values were lower in femoral nerve block as against for fentanyl.[8]

Similarly, MJ Yun *et al.* compared IV Alfentanil with fascia iliaca block using lidocaine. VAS score during placement in lateral decubitus position were lower in the block than in alfentanil group.[4]

In our study, we have compared, femoral nerve block with control group of patients who did not receive block for positioning during CSE in fracture femur cases avoiding any major complications like nerve injuries or vascular puncture. The study helped in training postgraduate students as better positioning avoided patient discomfort during performance block .

We observed that the VAS score for positioning in two groups were statistically significant (1.4 ± 0.498 and 4.03 ± 0.32 in FNB and NB groups respectively). Score for quality of patient positioning 2.10 ± 0.308 and 1.13 ± 0.346 in FNB and NB group was also statistically significant. The time required for the technique was16.23 ± 2.788 min. in FNB group as compared to19.23 ± 2.674 min.in NB group and was statistically significant. It was observed that 24 hours post-operatively the patients were asked regarding the acceptance of the technique and it was seen tha t24 patients had grade 2 (good) acceptance while 3 patients had grade 1 (average) and grade 3 (optimal) in group FNB. But in NB group all had severe pain during positioning.

We concluded that femoral nerve block is an easy and effective technique in reducing pain during the CSE technique. It decreases the performance time and gives better quality of positioning. It also aids in teaching the post graduate trainees with minimal discomfort to the patients. By giving peripheral block, we avoid the systemic complications of analgesics especially in elderly patients.

The block can be administered safely in emergency department setting and can provide effective pain relief while allowing for accurate monitoring of associated head, chest and abdominal injuries.

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