ORIGINAL RESEARCH PAPER

Anaesthesiology

COMPARISON OF ULTRASOUND GUIDED FEMORAL NERVE BLOCK AND SYSTEMIC INTRAVENOUS ANALGESIA FOR PAIN RELIEF IN TRAUMATIC SHAFT FEMUR FRACTURES

KEY WORDS: Fracture shaft femur, Femoral nerve block, Ropivacaine, intravenous analgesic.

Dr. Akanksha Monil Parsana Assistant Professor, Dept. of Anaesthesia, PSMC, Karamsad, Gujarat.

Dr Ajay Kumar Verma Fellow, Dept. of Onco Anaesthesiology, Division of Anaesthesiology, RGCIRC, Delhi.

Dr Roshni Gupta* Associate Consultant, Fortis Memorial Research Institute, Gurugram *Corresponding Author

ABSTRACT

Background: USG guided femoral nerve block is useful technique for pain relief in fracture shaft femur. **Aims and Objective:** 1) To study whether USG guided femoral nerve block is more effective in pain management of femoral shaft fractures than systemic intravenous analgesia. 2) To study the duration of action of femoral nerve block for pain relief in femoral shaft fractures. **Materials and Methods:** 100 patients of ASA I and II, aged 20-50 years, with traumatic fracture femur were randomly allocated to group FNB (n-50, USG guided femoral nerve block using 10 ml 0.75% Ropicvacaine) and group DICLO (n-50, systemic analgesia using Inj. Diclofenac 75 mg.) Each case was subsequently followed up for onset and total duration of analgesia till 6 hours postoperatively. Efficacy in both groups was assessed by visual analogue scale. **Results and Summary:** There is no significant difference in onset of action between both the groups. The duration of action in group FNB was more (5.58±1.08 hrs) than group DICLO (3.40±1.20 hrs). Visual analogue score showed significant pain reduction in group FNB after 15 minutes and also at 6hr(p=0.001) in comparison with group DICLO. **Conclusion:** Femoral nerve block is safe, simple and more efficacious procedure in comparison to systemic IV analgesia for acute pain management in patients with fracture shaft femur.

INTRODUCTION

Fracture shaft femur is a painful bony injury. Surgery involves open reduction and internal fixation. Movement of affected extremity leads to severe pain. Adequate pain relief increases comfort and improves positioning for spinal block. A femoral nerve block provides better pain relief for prolonged duration in patients with femur fractures than systemic analgesics[1,2].

It gives prompt pain relief within 10 minutes. It is easy to administer, is safe and has few side effects.[2,3]

Our aim is to study onset, duration, and efficacy of pain relief with femoral nerve in comparison to systemic intravenous analgesia for traumatic femoral fractures and to notify complications.

MATERIALS AND METHODS:

After taking approval from ethical committee and informed written consent, 100 patients were included in the study. Patients having femur fracture were assessed and resuscitated after admission in trauma center. They were randomly allocated to Group FNB (n-50, USG guided femoral nerve block using 10ml 0.375% Ropicvacaine) and Group DICLO (n-50, systemic analgesia using Inj. Diclofenac 75 mg i.v.). At the time of taking consent, patients were explained about the study and the four point visual analogue scale and classifying the intensity of pain as none, mild, moderate and severe at timely intervals. Simple randomization table was used gor group allocation. Each case was followed up every 15 mins. Pain score was assessed by visual analogue scale at the initial assessment, and at 15, 30, 60, 90, 120,180,360 mins interval. Data collecting doctor and patient were blinded to study group. The study was double blinded, saline injections were given to control group instead of 10 ml 0.75% Ropivacaine for femoral nerve block and patients in test group received iv saline instead of injection Diclofenac. Rescue therapy was given if patient had VAS score is >5 in either group during period of observation they were supplemented with Inj. Tramadol 1mg/kg i.v.

Inclusion criteria

1) Written and informed consent of patient
2) ASA risk I and II
3) Age of patient (20-50yrs.) of either gender
4) cases of traumatic fracture shaft femur.

Exclusion criteria

1) Patient's refusal
2) Patients with known allergy to drug
3) Patients with neurologic deficit or psychological disorder
4) Patients with any cardiovascular or renal disorder
5) Patients with vascular or neurological problem in affected limb
6) Partial or no femoral nerve block effect

Procedure

Equipment required

10 ml syringes, a 23 G needle, 20 ml vials of 0.75 % Inj. Ropivacaine and antiseptic for skin, USG machine, 22G 5 cm stimuplex needle.[2]

Technique

After taking aseptic and antiseptic precaution (painting and draping of operated limb and the Usg probe) the procedure was started. Standing on same side of operated limb, anterior superior iliac spine and pubic tubercle were palpated to visualize the inguinal ligament. Femoral artery just below the inguinal ligament could be palpated. USG probe was positioned and stimuplex needle was inserted at a point 1-2 cm lateral to arterial pulsation vertically until it was positioned near to the nerve bundle lateral to the artery. The position of needle next to the nerve bundle was confirmed using hydro-dissection with 2 ml saline. The local anaesthetic was slowly and then laterally to the artery in the fan like distribution.[2](10 ml 0.75% Ropivacaine).

Statistical analysis

Statistical analysis was done using the SPSS SOFTWARE. To calculate the sample size, a power analysis of α=0.05 and α=0.90, showed that 50 patients per study group were needed. Data are expressed as either mean or standard deviation or numbers and percentages. Continuous covariates were compared using ANOVA. Chi square test performed for the data evaluation with the p- value reported at the 95%

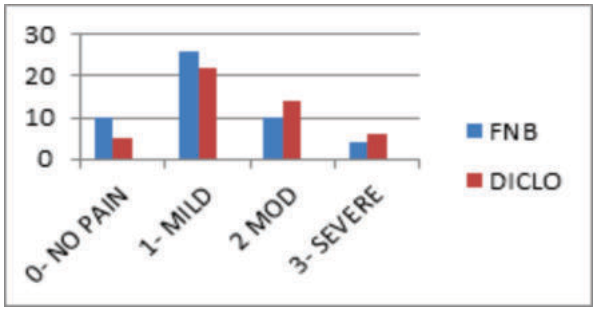
confidence interval. p<0.05 was considered statistically significant. Unpaired student t test was used to analyze duration of analgesia and severity of pain.

OBSERVATION AND RESULTS

1. Demographic data like age and sex ratio was comparable in both groups.

	AGE+SD	GENDER M:F
FNB GROUP	36.8+2.3	36:14
DICLO GROUP	35.4+1.8	40:10

2. Comparison of severity of pain score at different time interval:



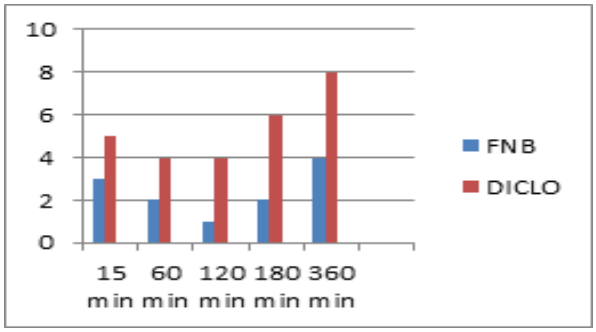
Pain relief at 15mins:

Pain significantly reduced within 15 minutes after block is performed in group FNB as compared to Group DICLO. The result is statistically significant (p=0.001). The severity of pain was observed to be less in group FNB as compared to group DICLO.

In Group FNB at 360 minute, the pain score was significantly less than group DICLO (p=0.001).

3. Comparison of duration of analgesia between two groups: Duration of action in Group FNB is 5.58±1.08 hrs hours and in Group DICLO is 3.40±1.20 hrs. This difference is statistically significant (p=0.0001).

4. Comparison of severity of pain in two groups There was better pain relief in Group FNB patients than Group DICLO, this can be seen by greater pain score reduction at all time intervals, it is statistically significant. This suggests that FNB is more efficacious than systemic intravenous analgesia.



Patients Requiring Rescue Analgesic

5. Comparison of number of patients with require rescue analgesia in two groups at different time point of observation. It was observed that the requirement of rescue analgesic was more in group DICLO than in group FNB.

6. Complication: There were no major complications. 3 patients were excluded due to partial block effect.

DISCUSSION

The patients who received femoral nerve block had significantly lower pain score at various time intervals after obtaining a block effect at (15-20 min) than score on comparative group. The effect was for prolonged period and more efficient than systemic analgesic. Patient acceptance was good & the block enabled the movement of affected limb comfortably after 15 minutes of block particularly at the time of pin insertion and giving traction. We did not face any major complication in our study except failure of block. Likely complications of femoral nerve block are allergy, systemic toxicity, nerve injury, intravascular injection, haematoma, infection, limb injury. [5]

CONCLUSION

Femoral Nerve Block is superior in providing pain relief, its effect lasts for longer duration and free of any major complication in comparison with systemic intravenous analgesia. Routine use of femoral nerve block at trauma bay helps the patient with fracture shaft femur in acute pain relief during traction, shifting, at steinman pin insertion and during positioning for subarachnoid block.

REFERENCES

1) Berry F.R. Analgesia in patients with fractured shaft of femur. Anaesthesia, 1977;32(6):576-7.
2) Tondare A.S.,Nadkarni A.V. (1982) Femoral nerve block for fractured shaft of femur.Canadian Anaesthetiests'Society Journal 1982;29:270-1.
3) Saranteas T, Karakitsos D, Alevizou A, Poularas J, Kostopanagiotou G, Karabinis A. Limitations and technical considerations of ultrasound-guided peripheral nerve blocks: Edema and subcutaneous air. Reg Anesth Pain Med. 2008;33:353–6.
4) R. McGlone, K.Sadhra, D.W. Hamer, P.E. Pretty, Femoral nerve block in the initial management of femoral shaft fractures. Archive of Emergency Medicine 1987;4:163-168.
5) Mutty CE,JensonEJ,Manka MA Jr., Anders MJ, Bone LB. Femoral nerve block for diaphyseal and distal femoral fractures in the emergency department. J Bone Joint Surg Am.2007 Dec;89(12):2599-603.