ORIGINAL RESEARCH PAPER

Anaesthesiology

# COMPARISION OF LANDMARK GUIDED FEMORAL NERVE BLOCK AND SYSTEMIC INTRAVENOUS ANALGESIA FOR PAIN RELIEF IN TRAUMATIC SHAFT FEMUR FRACTURE.

**KEY WORDS:** fracture, femoral nerve block, intravenous analgesic.

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**ABSTRACT**

**Background:** Femoral nerve block is useful technique for acute pain relief in case of fracture shaft femur in comparison to systemic analgesia. **Aims and Objective:** a) To study and compare whether femoral nerve block is more efficacious in pain management of femoral shaft fractures than systemic intravenous analgesia. b) To study the duration of action of femoral nerve block for pain relief in femoral shaft fractures. c) To notify any complication. **Materials and Methods:** 60 patients of ASA I and II, aged 20-60 years, having fracture traumatic shaft femur at either level (mid, upper, lower) were studied after admission of patient in emergency ward. They were randomly allocated to group A (n-30, femoral nerve block using 15 ml 2% Lignocaine) and group B (n-30, systemic analgesia using Inj. Paracetamol 1 gm). Each case was subsequently followed up for onset and total duration of analgesia till 6 hrs. 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 A was more (4.08±1.06 hours) than group B (2.18±1.24hours). Visual analogue score showed significant pain reduction in group A after 15 minutes and also at 180 minutes (p=0.000) in comparison with group B. **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 of femur is a painful bone injury as peri-osteum has low pain threshold. Surgical repair involves open reduction and internal fixation. Any movement leads to severe pain. Adequate pain relief increases comfort & improves positioning for spinal block. Analgesics or femoral nerve block (FNB) are often used to help the patient tolerate positioning. A femoral nerve block (FNB) provides better pain relief for prolonged duration in patients with femoral shaft fractures than currently used systemic agents.

Femoral nerve block gives prompt pain relief within 15 minutes. It is easy to administer, safe, has few side effects, cost effective with no expertise required.[2]

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

## MATERIALS AND METHODS:

After taking informed written consent, 60 patients were enrolled in the study. Patients having fracture shaft femur at any level (mid, upper, lower) were initially assessed and resuscitated after admission in emergency ward for this comparative study. They were randomly allocated to group A (n-30, femoral nerve block using 15 ml 2% Lignocaine) and group B (n-30, systemic analgesia using Inj. Paracetamol 1 gm i.v.). At the time of taking consent, patients were explained about the study, visual analogue scale and classifying the intensity of pain as none, mild, moderate and severe at timely intervals. Simple randomization table was generated. Pain score was assessed by visual analogue scale at the initial assessment, and at 15, 30, 60, 90, 120,180, 240, 360 minutes interval. Data collecting junior resident and patient were blinded to study group. The study was double blinded, the saline injections were given to control group instead of femoral block and patients in test group received i.v. saline instead of Inj. Paracetamol. Rescue therapy was given if patient had VAS score is >7 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 (20-60yrs.) of either gender
4) Patients with traumatic femoral shaft fractures

### 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
7) Patient with multiple trauma

### Procedure

### Equipment required

10 ml syringes, a 23 G needle, 20 ml 2% Inj. Lignocaine and antiseptic for skin. [2]

### Technique

After taking aseptic and antiseptic precaution, the procedure was started. Standing on opposite side to fractured limb anterior superior iliac spine and pubic tubercle were palpated to visualize the inguinal ligament. Femoral artery pulsations were felt just below the inguinal ligament. A needle was inserted 1-2 cm lateral to arterial pulsation vertically until penetration of facia over the nerve. Local anaesthetic was injected slowly after negative aspiration of blood.[2](15 ml 2% Lignocaine).

| Pain Score | No Pain | Mild Pain | Moderate Pain | Severe Pain |
|---|---|---|---|---|
| Our study | 0 | 1 | 2 | 3 |
| VAS Score | 0 | 0-3 | 4-7 | >7 |

### Statistical analysis

Statistical analysis was done using the SPSS SOFTWARE. 30 patients per group were included. Data was expressed as either mean or standard deviation or numbers and number percentages. Continuous covariates were compared using

analysis of variance (ANOVA) Chi square test performed for the data evaluation. $p<0.05$ was considered statistically significant. Unpaired student t test was used to analyze duration of analgesia and severity of pain.

## OBSERVATION AND RESULTS

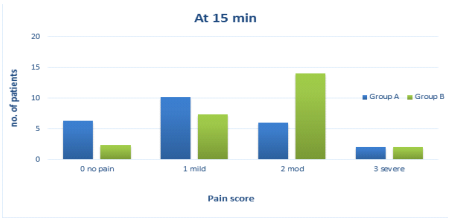
1. Demographic data like age and sex ratio was comparable in both groups.

| | Age ± mean ± SD | Gender M:F | #Level |
|---|---|---|---|
| Group A | 43.8 ± 5.7 | 22:5 | U – 9<br>M – 10<br>L - 8 |
| Group B | 40.2 ± 4.2 | 24:6 | U – 8<br>M – 12<br>L - 10 |

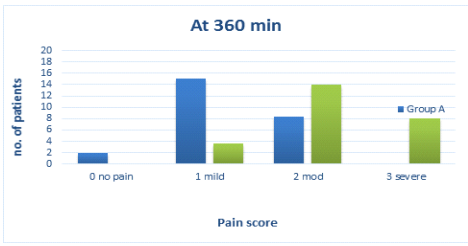
2. Comparison of severity of pain score at different time interval:

**Pain relief at 15mins:**

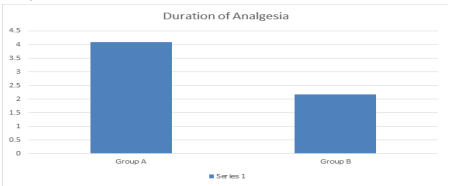
Pain significantly reduced within 15 minutes after block is performed in group A as compared to group B. The result is statistically significant (p=0.001). The severity of pain was less in group A as compared to group B.




In Group A at 360 minute, the pain score is significantly less than group B (p=0.001)



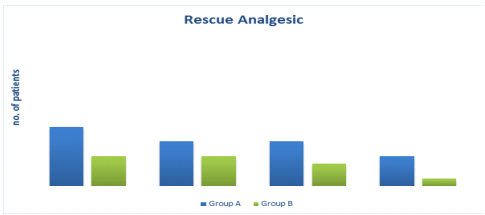

3.Comparison of duration of analgesia between two groups: Duration of action in Group A is 4.08±1.06 hours and in Group B is 2.18±1.24 hours. This difference is statistically significant (p=0.0001).




**4. Comparison of severity of pain in two groups**

There is better pain relief in Group A patients than Group B, 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.

5. Comparison of number of patients with require rescue analgesia in two groups at different time point of observation




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. Complication rate is low in this block. Likely complications of femoral nerve block are allergy, systemic toxicity, nerve injury, intravascular injection, haematoma, infection, limb injury. Any given complication can be prevented by using proper technique of block administration.[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 emergency ward helps the patient with fracture shaft femur in acute pain relief during traction, shifting, at the time of pin insertion, during various positioning even it is given by trained healthcare provider or junior staff.

## REFERENCES

1) Fletcher AK, Rigby AS, Heyes FL. Three-in-one femoral nerve block as analgesia for fractured neck of femur in the emergency department: a randomized, controlled trial. Ann Emerg Med 2003;41(2):227-33.
2) 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.
3) 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.
4) Khoos.T. Brown T.C.Femoral nerve block-the anatomical basis for a single injection technique. Anaesthesia and Intensive Care 1983;11:40-2.
5) Tan TT,Coleman MM. Femoral blockade for fractured neck of femur in the emergency department.Ann Emerg Med 2003;42(4):596-7.
6) Berry F.R. Analgesia in patients with fractured shaft of femur.Anaesthesia, 1977;32(6):576-7.
7) Johnson C.M. Continuous femoral nerve blockade for analgesia in children with femoral fractures. Anaesth Intens Care 1994;22:281–283.
8) Chu RS, Browne GJ, Cheng NG, Lam LT. Femoral nerve block for femoral shaft fractures in a paediatric emergency department: Can it be done
9) Tondare A.S.,Nadkarni A.V. (1982) Femoral nerve block for fractured shaft of femur.Canadian Anaesthetiests'Society Journal 1982;29:270-1.
10) 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.