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Analgesia for the Performance of Spinal Anaesthesia in Sitting Position in the Patients with Proximal Femoral Fracture: A Comparison Between Ultrasound Guided Fascia Iliaca Block and Femoral Nerve Block

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Abstract
Fracture of the femur occurs most commonly after trauma or trivial fall especially in the elderly. This causes significant morbidity. Surgery for fracture femur may be done under regional or general anesthesia. It has been shown that regional anesthesia is associated with lesser morbidity and mortality compared to general anesthesia. There were no other significant differences between the groups. They concluded that on Both ultrasound-guided continuous femoral nerve block and fascia iliaca compartment block with the novel cannula-over-needle provide effective anesthesia and postoperative analgesia for elderly hip replacement patients. After obtaining informed and written consent from 60 ASA 1, 2 and 3 patients, who were scheduled for orthopedic surgeries (lower limb) in Sree mookambika college of medical sciences were participated in this study. Hospital ethical committee approval was obtained.60 patients were randomized into 2 groups, inclusion criteria are ASA 1,2 and 3, Age 18-65 years, Both sexes, Proximal femour fixation surgery. Exclusion criteria are ASA 4, Age <18 and >65, Allergic to local anaesthetics, Hepatic or renal failure, Coagulation abnormalities, Infection/Inflammation at the site of injection. Positioning patients for spinal anesthesia with fractured femur is challenging because even minimal overriding of the fracture ends is exceedingly painful. Providing analgesia before positioning not only increases patient comfort but also improves positioning and successful spinal block Fascia illiaca block offers superior analgesia compared to femoral nerve block in patients with femur fracture during positioning for spinal anaesthesia. Visual analog scale during positioning of spinal anaesthesia Both techniques provided reduction in VAS during positioning but Reduction in VAS by FICB was higher than FNB in the present study with higher significance. Study demonstrate that fascia iliaca compartment block provides better analgesia than femoral nerve block in terms of facilitating optimal positioning for subarachanoid block in patients undergoing proximal femoral fracture fixation procedure. Being done under ultrasound guidance the risk of complications are minimal.

INTRODUCTION

Fracture of the femur occurs most commonly after trauma or trivial fall especially in the elderly. This causes significant morbidity. Surgery for fracture femur may be done under regional or general anesthesia. It has been shown that regional anesthesia is associated with lesser morbidity and mortality compared to general anesthesia. Regional anesthesia was associated with a lower adjusted odds of mortality compared to general anesthesia. Thus, femur fracture surgeries are performed safely under regional anesthesia. subarachanoid block is administered in either the sitting or lateral position. Positioning patients for spinal anesthesia with fractured femur is challenging because even minimal overriding of the fracture ends is exceedingly painful. Providing analgesia before positioning not only increases patient comfort but also improves positioning and successful spinal block. So this study is conceived to compare the efficacy of two different block for providing analgesia during positioning for spinal anaesthesia. The study titled "Ultrasound Guided Femoral Nerve Block to Provide Analgesia for Positioning Patients with Femur Fracture Before subarachanoid Block: Comparison with Intravenous Fentanyl". It is randomized trial done on Forty patients undergoing surgery for femur fracture were randomized to either femoral nerve block (FNB) or intravenous fentanyl (IVF) group. Group FNB (n=20) received 20 ml of 2% lignocaine around femoral nerve under ultrasound guidance. IVF group (n=20) received 2 mc/kg of fentanyl intravenously. Pain score on effected limb was assessed after five minutes. If VAS was $\leq$4, the patient was positioned in sitting for subarachanoid block. On failure to achieve this with the above treatment, intravenous fentanyl 0.5 mc/kg was administered and repeated as necessary before positioning[1]. VAS during positioning was documented and compared between the two groups. Similarly, secondary outcomes of the intervention: quality of patient position, rescue analgesia and duration of the procedure were also compared. Data were subjected to Mann Whitney U-test and chi-square test. Level of significance was set at 0.05. FNB group had significantly less VAS scores (median) than IVF group: 2 vs 3., p=0.037) during positioning for spinal anaesthesia. Procedure time (median) for spinal anaesthesia was also significantly less in FNB than in IVA group (10 vs 12 min., p=0.033) Ultrasound guided femoral nerve block was more effective than intravenous fentanyl for reducing pain in patients with proximal femur fracture before spinal anaesthesia. The study titled "Analgesia before Performing subarachanoid Block in the Sitting Position in Patients with Proximal Femoral Fracture: A Comparison between Fascia Iliaca Block and Femoral Nerve Block" In this study, Group FICB patients (n=15) received fascia iliaca block with 30 ml of 1.5% lignocaine with adrenaline and group FNB patients (n=15) received femoral nerve block with 15 ml of 1.5% lignocaine with adrenaline. After the study blocks, patients were kept on supine position for at least 20 minutes before shifting them to the operation theatre. Pain was assessed by using visual analog scale values before the block and during the position for subarachanoid block. Time to perform subarachanoid block, quality of positioning and acceptance was recorded. Visual analog scale values during positioning for SAB were lower in FIB group than in FNB (1.0±1.1 versus 2.1±0.8., P<0.05). Time to perform SAB was shorter in FIB than in FNB (109.6±28.2 seconds vers us 134.8±31.9 seconds., P<0.05). Quality of patient positioning for SAB was comparable between the groups. Patient acceptance was less in group FNB (P<0.05). They concluded that Fascia iliaca compartment block provides better analgesia than femoral nerve block in terms of facilitating optimal positioning for subarachanoid block in patients undergoing proximal femoral fracture fixation procedure. Department of Anesthesiology, Tongji Hospital of Tongji University, Shanghai, China. In this prospective, randomized controlled clinical investigation, 60 elderly patients undergoing hip replacement were randomly assigned to receive either continuous femoral nerve block or continuous fascia iliaca compartment block. After ultrasound-guided nerve block, all patients received spinal anesthesia for surgery and postoperative analgesia through an indwelling cannula[2]. There was a significant difference between the 2 groups in the mean visual analog scale scores (at rest) at 6 hours after surgery: 1.0±1.3 in the femoral nerve block group vs 0.5±0.8 in the fascia iliaca compartment block group (P<0.05). The femoral nerve block group had better postoperative analgesia on the medial aspect of the thigh, whereas the fascia iliaca compartment block group had better analgesia on the lateral aspect of the thigh. There were no other significant differences between the groups. They concluded that on Both ultrasound-guided continuous femoral nerve block and fascia iliaca compartment block with the novel cannula-over-needle provide effective anesthesia and postoperative analgesia for elderly hip replacement patients[3].

Aims and Objectives of the Study: Compare the feasibility and effectiveness of fascia iliaca block and femoral nerve block in reducing pain associated with positioning for subarachanoid block in patients undergoing proximal femour fixation procedures. Primary outcome are Vas score before and vas score at positioning for sab. Secondary outcome Time to performance of spinal block, Quality of positioning during spinal anaesthesia, No of attempts hemodynamic variability, Failure to perform spinal anaesthesia.

MATERIALS AND METHODS

After obtaining informed and written consent from 60 ASA 1, 2 and 3 patients, who were scheduled for orthopedic surgeries (lower limb) in Sree mookambika college of medical sciences were participated in this study. Hospital ethical committee approval was obtained. 60 patients were randomized into 2 groups, inclusion criteria are ASA 1,2 and 3, Age 18-65 years, Both sexes, Proximal femour fixation surgery. Exclusion criteria are ASA 4, Age <18 and >65, Allergic to local anaesthetics, Hepatic or renal failure, Coagulation abnormalities, Infection/Inflammation at the site of injection. All the patients were premedicated with Inj.Midazolam 50mcg/kg IM half an hour before surgery. Preoperatively patient's PR, BP, Spo2, RR and Visual analog scale (VAS) for pain at Rest and movement were noted. Patients were assessed for pain using a 10-point VAS before performing block. Receive usg guided fascia iliaca compartment block. They were given 1.5% inj. Lignocaine 20 ml with inj. adrenaline 5mic/ml. Receive usg guided femoral nerve block. They were given 1.5% inj. Lignocaine 20 ml with inj. Adrenaline 5mic/ml Techniques of block were described earlier in this chapter. After performing the blocks the patients were kept in supine position for at least 20 min. The patients were made to sit with the help of operation theatre assistants while the skeletal traction was maintainedVAS was enquired and noted. Once the patient was in sitting position SAB was administered and laid down back to supine position. Time required to perform SAB (as defined as time from insertion of the spinal needle to complete deposit of drug in the subarachnoid space) was noted.quality of patient positioning Positioning was subjectively rated as good or satisfacfactory depending on the ease of positioning for SAB. No of attemptsNo of attempts for performance of spinal anaesthesia were calculated. Hemodynamic Variability hemodynamic changes were noted. Statistical analysis was done using the statistical package for social sciences (SPSS). Different statistical methods were used as appropriate. Mean±SD was determined for quantitative data and frequency for categorical variables. The independent t-test was performed on all continuous variables. The normal distribution data was checked before any t-test. The Chi-Square test was used to analyze group difference for categorical variables. A p-value <0.05 was considered significant.

RESULTS AND DISCUSSIONS

Table 1: Age Distribution

Age in years	Group FNB	Group FICB
<40	3	2
41-50	9	7
51-60	12	14
>60	6	7
Total	30	30
Mean	53.07	54.6
SD	8.65	8.11
t' value	0.708	
p' value	0.482	Not significant

Inference: Age of the patients were comparable between two groups.

Table 2: Gender Distribution

Gender	Group FNB	Group FICB
Male	18	18
Female	12	12
Total	30	30
Chi square	0.069	
p value	0.792	Not Significant

Inference: Gender data were comparable between the groups.

Table 3: Weight Distribution

Weight in kgs	Group FNB	Group FICB
<50	2	5
51-56	17	8
61-70	10	16
>70	1	1
Total	30	30
Mean	59.2	61.87
SD	7.14	8.44
t' value	1.32	
p' value	0.192	Not significant

Inference: Weight of the patients were comparable between two groups.

Table 4: Vas Score at Block

VAS at Block	Group FNB	Group FICB
Score 2	1	0
3	14	23
4	12	6
S 5	3	1
Total	30	30
Mean	3.57	3.27
SD	0.73	0.52
t' value	1.836	
p' value	0.072	Not significant

Inference: VAS score at block were comparable between two groups.

Table 5: Vas at Positioning for Sab

vas at positioning for SAB	Group FNB	Group FICB
Score 0	0	1
1	1	20
2	16	9
S 3	13	0
Total	30	30
Mean	2.4	1.27
SD	0.57	0.52
t' value	8.09	
p' value	<0.001	Significant

Inference: Vas score at positioning for sab is better in fascia illiaca compartment block than femoral nerve block.

Table 6: Time to Performing Spinal Anaesthesia

Time to perform SAB	Group FNB	Group FICB
<120	9	25
121-140	13	5
>140	8	0
Total	30	30
Mean	133	107.2
SD	15.45	11.08
t' value	7.431	
p' value	<0.001	Significant

Inference: Time required for performing the SAB is much lower in FICB than FNB group Better pain relief and, therefore, better positioning with the FICB group.

Table 7: Quality of Positioning

Quality	Group FNB	Group FICB
Good	21	28
Unsatisfactory	9	2
Total	30	30
Chi square	4.007	
p value	0.045	Significant

Inference: Good analgesia and paralysis of some muscles (eg. quadriceps) following FICB are the likely reasons for more comfortable positioning in the group.

Table 8: No of Attempts Comparison

No of Attempts	Group FNB	Group FICB
One attempt	22	30
>one attempts	8	0
Total	30	30
P value	<0.005	

Inference: FICB has made spinal anaesthesia position easier compared to femoral nerve block. 30 patients out 30 were shown successful single attempt for spinal anaesthesia in FICB group and only 22 patients out of 30 in FNB group.

Positioning patients for spinal anesthesia with fractured femur is challenging because even minimal overriding of the fracture ends is exceedingly painful. Providing analgesia before positioning not only increases patient comfort but also improves positioning and successful spinal block Fascia illiaca block offers superior analgesia compared to femoral nerve block in patients with femur fracture during positioning for spinal anaesthesia. Visual analog scale during positioning of spinal anaesthesia Both techniques provided reduction in VAS during positioning but Reduction in VAS by FICB was higher than FNB in the present study with higher significance. VAS score 2.4±0.57 in FNB group were only 1.27±0.57 in FICB group The obturator and lateral cutaneous nerve of thigh are not affected by the FNB, explaining less reduction in pain in the group. This is in agreement with the study done by Dalen et al and Capdevila *et al.* Time required for performing SAB with FICB was almost half a minute less than that of FNB in the present study. Better pain relief and, therefore, better positioning with the FICB is well reflected in the time required for performing the SAB. Time required for performing SAB with FNB group is 133±15.45 sec where as in FICB it is only 107±11.08 sec. Time required for performing SAB were comparable between two groups. This is in agreement with the study done by time reported by Sia[4]. Good analgesia and additional involvement of obturator nerve ana lateral cutaneous nerve of thigh following FICB are the likely reasons for more comfortable positioning in the group. 28 patients out 30 were shown good satisfaction with positioning and only 21 patients in group FNB shown good satisfaction with positioning[5-7]. Due to optimal positioning for SAB all the patients in group FICB-are able to perform spinal within one attempt, but in group FNB only in 22 patients spinal performed within one attempts, remaining patients successful in subsequent attempts. Failure to give spinal anaesthesia There was no failure in performing spinal anaesthesia in both groups. There was no failed block or patchy block noted. There was no complications like giddiness, sweating while performing spinal anaesthesia. The results obtained by previous study regarding VAS score during positioning for spinal anaesthesia, time to perform spinal anaesthesia and patient satisfaction, no of attempts were similar to our study[8,9].

CONCLUSION

Study demonstrate that fascia iliaca compartment block provides better analgesia than femoral nerve block in terms of facilitating optimal positioning for subarachnoid block in patients undergoing proximal femoral fracture fixation procedure.Being done under ultrasound guidance the risk of complications are minimal.

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