Biological and Clinical Sciences Research Journal
eISSN: 2708-2261; pISSN: 2958-4728
www.bcsrj.com
DOI: https://doi.org/10.54112/bcsrj.v2024i1.1030
*Biol. Clin. Sci. Res. J., Volume, **2024**: 1030*
Original Research Article

EFFICACY OF FASCIA ILIACA BLOCK FOR ACUTE PAIN MANAGEMENT IN PATIENTS WITH HIP FRACTURES. A PROSPECTIVE COHORT STUDY

RAFIQ SU*, AHMAD T, GHAZNI MA, JAMAL S, NOORDIN S, SULAIMAN MA

Department of Orthopedic Surgery, Aga Khan University Hospital Karachi, Pakistan
**Corresponding author`s email address:* syed.umar.rafiq@gmail.com

(Received, 19th May 2024, Revised 30th July 2024, Published 7th August 2024)

Abstract: *The fascia iliaca block is a compartment field block that effectively treats pain from hip fractures and hip surgeries. Fascia iliaca block reduces preoperative and postoperative pain scores, postoperative opioid consumption, and the occurrence of opioid-related adverse events.* ***Objective:*** *To assess the efficacy of fascia iliaca block for acute pain management in patients with hip fractures.* ***Methods:*** *Thirty-three patients of both genders were included. Fascia iliaca Block was applied using a landmark-based technique. The Numeric Rating Score was measured. The normality of data was checked, and the Median (IQR) was reported due to non-normal distribution. Frequencies and percentages were calculated for qualitative variables. The Chi-square/fisher exact test was applied to determine the association between qualitative variables, while odds were calculated by binary logistic regression. Friedman and Wilcoxon Signed Ranks Test made comparisons for quantitative variables.* ***Results:*** *[PAIN SCORE pre+post block. Resue analgesia %]. Males are more likely than females to need rescue analgesia (OR=1.161, p=0.840). Compared to patients over 65, those under 65 are less likely to require rescue analgesia (OR=0.900, p=0.900). There was a significant difference throughout the periods, with the median VAS score before FIB, at 15 minutes, at 1 hour, at 6 hours, and at 12 hours being 9 (IQR:8-10), 5 (IQR:3-6), 2 (IQR:1-3), 2 (IQR:1.5-4), and 5 (IQR;4-6), respectively.* ***Conclusion:*** *The fascia iliaca block for hip fractures is an effective pain management method. It also provides postoperative short-term analgesic effects both at rest and with movement.*

Keywords: Efficacy, Fascia Iliaca Block, Acute Pain, Hip Fractures

Introduction

With the progressive aging population, hip fractures have become a significant public health issue worldwide (1). The absolute number of hip fractures is estimated to increase from 1.6 million in 2000 to 6.3 million by the year 2050 (2). Besides, hip fracture ranks among the top 10 of disability (3). Hip fracture is associated with significant postoperative systemic complications and high mortality due to the burden of major surgery in a morbid patient (4). Hip fracture is a major public health problem in the Asian population. Hip Fractures commonly refer to the femoral neck and trochanteric fractures, including intertrochanteric and subtrochanteric fractures or a combination of both (5).

Almost all cases of hip fractures require surgery and are associated with post-operative morbidity and mortality (6). The disability rate of hip fracture is relatively high, and the mortality of patients one month and one year after surgery can be “10% and 36%” (7). With an increasingly aging population, elderly hip fracture, at present, is a global public health problem, jeopardizing physical and mental health, as well as quality of life (8).

The hip fracture causes moderate to severe pain, and its analgesic management is often reported as insufficient (9). These patients usually bring with them multiple comorbidities, associated with higher mortality rates of 8-10% in the first 30 days and 15-30% within the first year (10). Current guidelines suggest such patients should receive surgery as soon as possible, even within 24-48 hours after injury. Early treatment can reduce pain and increase surgical success (11). Unfortunately, geriatric patients with hip fractures are at risk for the underassessment of pain as well as delays in initial analgesic treatment (12). Furthermore, opioids are the mainstay of pain treatment, even though older patients are at increased risk for the adverse effects of opioids (13). Thus, developing a practical, useful, and timely non-opioid analgesic technique is critical to the care of this population (12).

The fascia iliaca block (FIB) is a compartment field block that targets the thigh's femoral, obturator, and lateral cutaneous nerve. Studies have shown the efficacy of FIBs in treating pain from hip fractures and in surgeries involving the hip, knee, and anterior thigh (14). Successful blockade requires depositing large volumes of local anesthetic (30–40 mL) (15). In recent years, enhanced recovery after surgery has been standard in surgical procedures. This leads to an increased focus on perioperative pain management. The iliac fascia space is a potential space between the iliac fascia and iliopsoas muscles. It houses the femoral nerve, obturator nerve, and lateral femoral cutaneous nerve, which runs behind the iliac fascia (16). Fascia iliaca compartment block (FICB), proposed by Dalens in 1989(17), effectively blocks the above nerves with few adverse effects. FICB is well-accepted as a perioperative analgesia for patients with hip fractures. Both British and American physician associations recommend FICB for early analgesia following hip fracture (18).

Fascia iliaca peripheral nerve blocks (FIBs) have emerged as an opioid-sparing analgesic technique for geriatric patients with hip fractures by anesthetizing the proximal aspect of the thigh (19). The use of FIBs within this population reduces preoperative and postoperative pain scores, postoperative opioid consumption, and the

[Citation: Rafiq, S.U., Ahmad, T., Ghazni, M.A., Jamal, S., Noordin, S., Sulaiman, M.A. (2024). Efficacy of fascia iliaca block for acute pain management in patients with hip fractures. A prospective cohort study. *Biol. Clin. Sci. Res. J.*, **2024***: 1030*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1030]

occurrence of opioid-related adverse events (20). Indications of FICB are surgical anesthesia to the lower extremity, management of cancer pain and pain owing to inflammatory conditions of the lumbar plexus, and amelioration of acute pain following trauma, fracture, and burn (21), while contraindications of FICB are few, including patients with coagulopathy, those who are taking antithrombotic medications, infection at the injection site, or history of femoral bypass surgery (22, 23). Besides, allergies to the anesthetic agents and crush injury at or near the injection site are set as absolute contraindications (22, 23).

There is an increasing trend towards using Local anesthetic blocks for better pain management before and after surgery. The purpose of our study is to investigate whether providing a Fascia Iliaca block provides effective analgesia before definitive fixation and minimizes the requirement of other analgesic drugs. Moreover, there is a scarcity of data on the effectiveness of fascia iliaca block post-operatively in our setting.

Methodology

This prospective cohort study was conducted at the Aga Khan University Hospital, Karachi. ERC exemption was sought from the institution's Ethical Review Committee before the commencement of this study. A total of 33 patients were included in the study. The sample size was calculated using the non-probability consecutive sampling technique. All the successive patients above 18 years of age with acute proximal femur fractures (including neck of femur, intertrochanteric, and subtrochanteric) and had numeric rating scores (NRS) >3 were included in the study. Patients who have Polytrauma, open fractures, bilateral fractures, impaired cognition, polyneuropathy, coagulation profile impairment, infection at the site of injection, known hypersensitivity to the local anesthetic agent, a patient undergoing chemotherapy, injury in other parts of the ipsilateral limb, and already given analgesia were not included in the study.

All included patients who were presented in the Emergency Department with a history of fall, trauma, or road traffic accident and with presenting complaints of groin or thigh pain raising suspicion of hip fracture were assessed, first by the on-duty doctor in the Emergency department in case of any bony injury a consultation request was raised for the department of orthopedic surgery; the consultation request was attended by the on-call Orthopedic Surgery Resident who assessed the patient and radiographs and advice further management for the patient. All patients consenting to participate in the study and fulfilling the inclusion criteria were given Fascia Iliaca Block (by a person credentialed to administer the block). The variables that were noted include age, gender, type of fracture, time since injury, co-morbid medical conditions, Numerical Rating Scale, and need for rescue analgesia.

The fascia iliaca block was administered using the landmark-based technique. An imaginary line was drawn between the ASIS and the pubic tubercle, and the outer one-third of this line was marked. The site of injection was 1cm caudal to this marked site. A spinal 22G needle was inserted at 60 degrees, pointing to the cephalad, and after palpation of the femoral artery, confirming that the injection site is lateral to the femoral neurovascular bundle. A “double pop” sensation was felt to identify the needle passing through the fascia lata, followed by the fascia iliaca. Once the second “pop” was felt, the local anesthetic was infiltrated after aspiration to confirm no venous or arterial penetration (24). 50mg (10mg/ml) Ropivacaine was diluted in 5ml of Normal Saline and infiltrated (maximum dose of 3 mg/kg) (24). The numerical rating score (NRS) was measured before the procedure, then at 15 minutes, 1 hour, 2 hours, 6 hours, 12 hours, and 24 hours. The numerical Rating Scale is a subjective measure of acute and chronic pain ranging from 0 to 10, with zero being no pain and 10 being the worst pain imaginable. Only Paracetamol was administered to the patient at regular intervals as a baseline analgesic, and all other analgesia were considered as Rescue Analgesia and considered when NRS was more than 4. The time and dose of the rescue analgesia were also noted.

Data were compiled and analyzed using the Statistical Package for Social Sciences (SPSS) version 19. Mean and standard deviations were calculated for the quantitative variables (age, mean NRS score, and frequency of rescue analgesia). The Wilks test checked the normality of the data. Median (IQR) was reported for those variables that were not normally distributed. Frequencies and percentages were calculated for the qualitative variables like gender, fracture type, the need for rescue analgesia, and adverse events. The Chi-square/fisher exact test was applied to determine the association between qualitative variables, while odds were calculated by binary logistic regression. Friedman and Wilcoxon Signed Ranks Test made comparisons for quantitative variables. P-values less than 0.05 were considered significant.

Results

The study comprised 33 patients with hip fractures in total. The median age was 73 years (IQR: 65.5-77 years), with 63.63% female and 36.4% male. The majority of patients (75.6%) were older than 65. Just 3 individuals, or 9.1%, out of 33, had concomitant conditions. Of the three co-morbid patients, 33.3% have diabetes mellitus, 100% have hypertension, and 33.3% have ischemic heart disease. There were 45.5% of individuals diagnosed with Intertrochanteric, and 51.5% with a femur neck. No complications were observed, but 39.4% of patients required rescue analgesia. Table 1 presents comprehensive descriptive information on the study population.

There was a significant difference throughout the time periods ($p<0.001$), with the median VAS score before FIB, at 15 minutes, at 1 hour, at 6 hours, and at 12 hours being 9 (IQR:8-10), 5 (IQR:3-6), 2 (IQR:1-3), 2 (IQR:1.5-4), and 5 (IQR;4-6), respectively. Tables 2 and 3 provide comprehensive results of the VAS score at various time intervals and a comparison of the VAS score at various time intervals with the VAS prior to FIB, respectively.

Among patients who needed rescue analgesia, 38.5% were male, and 61.5% were female. Moreover, among the same patients, 23% were younger than 65 years of age, and 77% were older. However, according to uni-variate logistic regression, the odds of requiring rescue analgesia were insignificant between males and females (OR=1.161, p=0.840) and between patients over 65 years and 65 or less (OR=0.900, p=0.900). Detailed odds are presented in Table**:** 4.

[Citation: Rafiq, S.U., Ahmad, T., Ghazni, M.A., Jamal, S., Noordin, S., Sulaiman, M.A. (2024). Efficacy of fascia iliaca block for acute pain management in patients with hip fractures. A prospective cohort study. *Biol. Clin. Sci. Res. J.*, **2024***: 1030*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1030]

Table 1: Descriptive statistics of the study population (n=33)

Characteristics	n (%)
Gender	
Male	12(36.4)
Female	21(63.6)
Age (years)	
Median (IQR)	73.00(65.50-77.00)
Groups	
≤65 years	8(24.2)
>65 years	25(75.8)
Comorbid	
Yes	3(9.1)
No	30(90.9)
Comorbid Type (n=3)	
Diabetes Mellitus	6(18.2)
Hypertension	17(51.5)
Ischemic Heart Disease	7(21.2)
Chronic Kidney Disease	3(9.1)
Cerebral Vascular Accident	1(3)
Chronic obstructive pulmonary disease	1(3)
S/P CABG	2(6.1)
Diagnosis	
Neck of femur	17(51.5)
Subtrochanteric	1(3.0)
Intertrochanteric	15(45.5)
Complication	
Yes	0(0)
No	33(100)
Need of Rescue analgesia	
Yes	13(39.4)
No	20(60.6)

Table 2: VAS score at different time intervals

	VAS Score Median (IQR)
Before FIB	9(8-10)
At 15 minutes	5(3-6)
At 1 hour	2(1-3)
At 6 hours	2(1.5-4)
At 12 hours	5(4-6)
At 24 hours	0(0-0)
p-value	**0.000***
Friedman Test was applied. ****Significant at 0.05 level.***	

Table 3 **Difference of VAS score at different time intervals with VAS before FIB**

	Median Difference	p-value
Before FIB - At 15 minutes	4	0.000*
Before FIB-At 1 hour	7	0.000*
Before FIB-At 6 hours	7	0.000*
Before FIB-At 12 hours	4	0.000*
Before FIB-At 24 hours	9	0.000*
*Wilcoxon Signed Ranks Test was applied.*Significant at 0.05 level*		

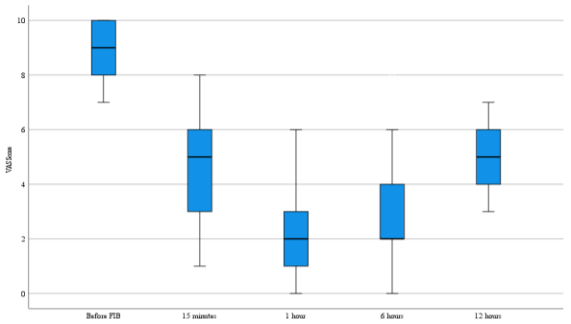

Figure 1: VAS score at different time intervals

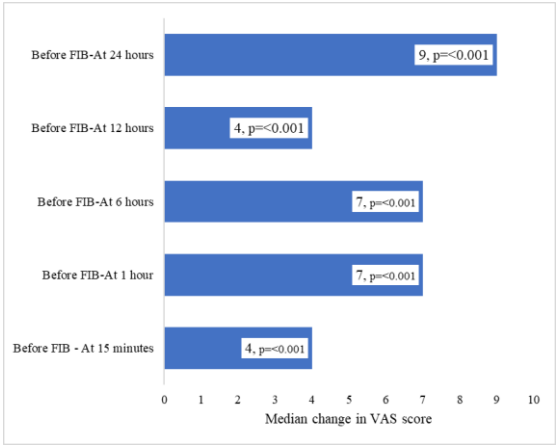

Figure 2: Median change in VAS score.

Table 2: Frequency and odds according to need for rescue analgesia

	Need of Rescue analgesia n (%)		Un-Adjusted	
	Yes	**No**	**Odds ratio (95% CI)**	**p-value**
Gender				
Male	5(38.5)	7(35.0)	1.161(0.273-4.932)	0.840
Female	8(61.5)	13(65.0)	Ref	
Age Group				
≤65 years	3(23.1)	5(25)	0.900(0.175-4.639)	0.900
>65 years	10(76.9)	15(75)	Ref	
Comorbid				
Yes	1(7.7)	2(10)	0.750(0.061-9.221)	0.822
No	12(92.3)	18(90)	Ref	
Diagnosis				
Neck of femur	7(53.8)	10(0)	1.050(0.255-4.319)	0.946

[Citation: Rafiq, S.U., Ahmad, T., Ghazni, M.A., Jamal, S., Noordin, S., Sulaiman, M.A. (2024). Efficacy of fascia iliaca block for acute pain management in patients with hip fractures. A prospective cohort study. *Biol. Clin. Sci. Res. J.*, **2024***: 1030*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1030]

Subtrochanteric	0(0)	1(5)	0.000(0.000-0.00)	1.000
Intertrochanteric	6(46.2)	9(45)	Ref	
Binary logistic regression was applied.				

Discussion

Patients with hip fractures often suffer from severe pain, particularly during posture alterations that accompany examination and treatment. Pain management is critical in the pre- and post-operative periods of elderly hip fracture patients. Hence, good pain management can vastly improve patient outcomes (8). Effective pain management pre-operatively leads to shorter hospital stays and improved outcomes in elderly patients with a hip fracture. Conversely, patients who experience uncontrolled pain are at a higher risk of developing delirium, have more extended hospital stays, and report persistent pain up to six months after a hip fracture (25).

Traditional surgical anesthesia methods for hip fractures mainly involve epidural anesthesia. Although this meets surgical treatment needs, pain sensation tends to return early after surgery. Epidural analgesia after surgery provides good analgesia, but it has fallen out of favor as anticoagulants and early ambulation are often considered necessary. Early postoperative analgesia is important for the rapid recovery of hip function (26). The FICB technique is associated with minimal risk because the puncture is made at a safe distance from the femoral artery and femoral nerve. It was demonstrated that even a low dose can significantly relieve pain within a few hours (27). The fascia iliaca compartment allows infiltrated local anesthetic of sufficient volumes to spread to at least two (the femoral and lateral femoral cutaneous nerves) of the three major nerves that supply the medial, anterior, and lateral thighs (28). Stevens and colleagues demonstrated that patients who underwent a FICB used significantly less morphine over 24 hours than the control group of patients who used morphine alone(29). A study (8) revealed that regional anesthesia techniques can markedly decrease postoperative pain at rest and with movement. Previous studies suggested that intravenous opioids could relieve pain at rest, but pain relief during movement is limited (30). In Norio Yamamoto's study comparing intravenous acetaminophen and FICB after a hip fracture operation, patients who received FICB experienced significantly less pain with movement on the seventh day after surgery (31). Previous studies revealed that FICB provides effective perioperative analgesia for elderly patients with hip fractures, with an effective rate of 90 % (32). In a study by Okereke et al., (0) a FICB was administered to patients in the emergency department by the admitting doctor after confirmation of a hip fracture on imaging. All patients had a weight-dependent volume of 0.25% levobupivacaine as an anesthetic agent because of its long-acting duration of effect of about 8-10 hours following a single block. The authors recorded a block success rate of 74% (28). There were several limitations to our study. First, we did not record the consumption of additional analgesics after surgery. Second, there was no testing to confirm the correct space of the block. It is necessary to make improvements in these aspects in subsequent experiments. Unfortunately, our patients were not blinded to the allocation as it would be unethical to implant a placebo fascia iliaca compartmental catheter purely for blinding purposes.

Conclusion

In conclusion, fascia iliaca blocks for hip fractures are a safe, simple, and rapidly effective pain management method that reduces the need for systemic analgesia. Further, fascia iliaca compartment blocks provide a postoperative short-term analgesic effect both at rest and with movement and accelerate postoperative short-term hip joint function recovery.

Declarations

Data Availability statement
All data generated or analyzed during the study are included in the manuscript.
Ethics approval and consent to participate
Approved by the department concerned. (ERC exemption)
Consent for publication
Approved
Funding
Not applicable

Conflict of interest

The authors declared the absence of a conflict of interest.

Author Contribution

SYED UMAR RAFIQ
Conception of Study, Development of Research Methodology Design, Study Design, manuscript Review, and final approval of manuscript.
TASHFEEN AHMAD
Coordination of collaborative efforts.
M AHMED GHAZNI
Study Design, Review of Literature.
SHAH JAMAL
Conception of Study, Final approval of manuscript.
SHAHRYAR NOORDIN (*Professor*)
Conception of Study, Development of Research Methodology Design
M AHSAN SULAIMAN
Data entry and data analysis, as well as drafting the article.

References

1. Wan HY, Li SY, Ji W, Yu B, Jiang N. Fascia Iliaca Compartment Block for Perioperative Pain Management of Geriatric Patients with Hip Fractures: A Systematic Review of Randomized Controlled Trials. Pain Res Manag. 2020 Nov;2020:8503963.
2. Cooper C, Cole ZA, Holroyd CR. Secular trends in the incidence of hip and other osteoporotic fractures. Osteoporosis Int. 2011;22(5):1277–88.
3. Cooper C, Campion G, Melton LJ. Hip fractures in older people: a world-wide projection. Osteoporosis Int. 1992;2(6):285–89.
4. Cheung CL, Ang SB, Chadha M, Chow ES, Chung YS, Hew FL, et al. An updated hip fracture projection in Asia:

The Asian Federation of Osteoporosis Societies study. Osteoporos Sarcopenia. 2018;4(1):16-21.
5. Haroon F, Younus S, Peracha A, Memon N, Memon N. Predictability of Surgical Apgar Score for postoperative outcomes in hip fractures: A prospective observational study. J Acute Dis. 2021;10(1):8-11.
6. Zaki HE, Mousa SM, El Said SMS, Mortagy AK. Morbidity and Mortality following Surgery for Hip Fractures in Elderly Patients. J Aging Res. 2019;2019:7084657.
7. BarahonaM, Barrientos C, Cavada G, Brañes J, Martinez A, Catalan J. Survival analysis after hip fracture: higher mortality than the general population and delayed surgery increases the risk at any time. HIP Int. 2020;30(1 suppl l):54-8.
8. Hao C, Li C, Cao R, Dai Y, Xu C, Ma L, et al. Effects of Perioperative Fascia Iliaca Compartment Block on Postoperative Pain and Hip Function in Elderly Patients With Hip Fracture. Geriatr Orthop Surg Rehabil. 2022 Apr;13:21514593221092883
9. Verbeek T, Adhikary S, Urman R, Liu H. The Application of Fascia Iliaca Compartment Block for Acute Pain Control of Hip Fracture and Surgery. Curr Pain Headache Rep. 2021 Mar;25(4):22.
10. Griffiths R, Alper J, Beckingsale A. Management of proximal femoral fractures 2011: Association of Anaesthetists of Great Britain and Ireland. Anaesthesia. 2012;67(1):85–98.
11. Colais P, Di Martino M, Fusco D, Perucci CA, Davoli M. The effect of early surgery after hip fracture on 1-year mortality. BMC Geriatrics. 2015;15:141.
12. Garlich JM, Pujari A, Debbi EM, Yalamanchili DR, Moak ZB, Stephenson SK, et al. Time to Block: Early Regional Anesthesia Improves Pain Control in Geriatric Hip Fractures. J Bone Joint Surg Am. 2020 May;102(10):866-72.
13. Leung JM, Sands LP, Paul S, Joseph T, Kinjo S, Tsai T. Does postoperative delirium limit the use of patient-controlled analgesia in older surgical patients? Anesthesiol. 2009 Sep;111(3):625-31.
14. Loessin V, ElZahabi AJ, Brownbridge B, Bajwa JS. Continuous fascia iliaca block for acute hip fractures: a randomized-controlled pilot study. Can J Anaesth. 2019 Oct;66(10):1265-67.
15. Foss NB, Kristensen BB, Bundgaard M, et al. Fascia iliaca compartment blockade for acute pain control in hip fracture patients: a randomized, placebo-controlled study. Anesthesiol. 2007;106:773-8.
16. Monzon DG, Iserson KV, Vazquez JA. Single fascia iliaca compartment block for post-hip fracture pain relief. J Emerg Med. 2007;32(3):257-62.
17. Parkinson SK, Mueller JB, Little WL, Bailey SL. Extent of blockade with various approaches to the lumbar plexus. Anesth Analg. 1989;68(3):243-48.
18. Miller GW, Godrey JJ, Sagmeister ML, Lewis TL. Provision of fascia iliaca compartment block in the acute management of proximal femoral fractures: A national observational study of UK hospitals. Injury. 2016;47(11):2490-94.
19. Nie H, Yang YX, Wang Y, Liu Y, Zhao B, Luan B. Effects of continuous fascia iliaca compartment blocks for postoperative analgesia in patients with hip fracture. Pain Res Manag. 2015 Jul-Aug;20(4):210-2.
20. Arsoy D, Gardner MJ, Amanatullah DF, Huddleston JI 3rd, Goodman SB, Maloney WJ, Bishop JA. Continuous femoral nerve catheters decrease opioid-related side effects and increase home disposition rates among geriatric hip fracture patients. J Orthop Trauma. 2017 Jun;31(6):e186-9.
21. Jones MR, Novitch MB, Hall OM. Fascia iliaca block, history, technique, and efficacy in clinical practice. Best Practice & Research. Clinical Anaesthesiol. 2019;33(4):407–13.
22. Pepe J, Madhani NB. Ultrasound-Guided Fascia Iliaca Compartment Block, StatPearls Publishing LLC., Treasure Island, FL, USA, 2020.
23. Nagel EM, Gantioque R, Taira T. Utilizing ultrasound- guided femoral nerve blocks and fascia iliaca compartment blocks for proximal femur fractures in the emergency department. Advanced Emergency Nursing J. 2019;41(2):135–44
24. Kassam A-AM, Gough AT, Davies J. Can we reduce morphine use in elderly, proximal femoral fracture patients using a fascia iliac block? GeriatrNur (Lond). 2018;39: 84–7.
25. Herrick C, Steger-May K, Sinacore DR, Brown M, Schechtman KB, Binder EF. Persistent pain in frail older adults after hip fracture repair. J Am Geriatr Soc. 2004,52:2062-8.
26. Gaffney CJ, Pelt CE, Gililland JM, Peters CL. Perioperative pain management in hip and knee arthroplasty. Orthop Clin N Am. 2017;48(4):407-19.
27. Wennberg P, M¨oller M, Herlitz J, Kenne Sarenmalm E. Fascia iliaca compartment block as a preoperative analgesic in elderly patients with hip fractures - effects on cognition. BMC Geriatrics. 2019;19(1):252.
28. Okereke IC, Abdelmonem M. Fascia Iliaca Compartment Block for Hip Fractures: Improving Clinical Practice by Audit. Cureus. 2021 September;13(9):e17836.
29. Stevens M, Harrison G, McGrail M. A modified fascia iliaca compartment block has significant morphinesparing effect after total hip arthroplasty. Anaesth Intensive Care. 2007;35:949-52.
30. Wennberg P, Hillberg H¨ornfeldt T, St°al S, Herlitz J, Bj¨or°as J, Larsson G. Fascia iliaca compartment block (FICB) as pain treatment in older persons with suspected hip fractures in prehospital emergency care - A comparative pilot study. International emergency nursing. 2021;57:101012.
31. Yamamoto N, Sakura S, Noda T. Comparison of the postoperative analgesic efficacies of intravenous acetaminophen and fascia iliaca compartment block in hip fracture surgery: A randomized controlled trial. Injury. 2019;50(10):1689-93.
32. Elkhodair S, Mortazavi J, Chester A, Pereira M. Single fascia iliaca compartment block for pain relief in patients with fractured neck of femur in the emergency department. Eur J Emerg Med. 2011;18(6):340-43.

[Citation: Rafiq, S.U., Ahmad, T., Ghazni, M.A., Jamal, S., Noordin, S., Sulaiman, M.A. (2024). Efficacy of fascia iliaca block for acute pain management in patients with hip fractures. A prospective cohort study. *Biol. Clin. Sci. Res. J.*, **2024***: 1030*. doi: https://doi.org/10.54112/bcsrj.v2024i1.1030]