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Effectiveness of fascia iliaca compartment block in adult fractured neck of femur patients: An integrative review

Abstract

Introduction: According to the Australian and New Zealand Hip Fracture Registry approximately 19 000 patients in Australia and 4000 patients in New Zealand will fall and fracture their hip every year. This poses a huge burden on health care facilities (both fiscally and functionally) and has an even more dramatic effect on the older patients who fall and their families. The purpose of this review is to give perioperative nurses a deeper understanding of regional blocks that may be considered – in particular, the fascia iliaca compartment block. Traditional pain management strategies, such as opioids, have limitations which leads to the use of several different types of regional blocks (some single injection, some continuous infusion) being administered as an alternative approach in providing pain relief prior to surgery.

Methods: A thorough search was conducted using CINAHL, MEDLINE and PubMed databases to find relevant papers published in English from 2016 to the present. Primary research studies – namely cohort studies, retrospective and prospective studies, and randomised controlled trials – were integrated to provide a synthesised overview of this topic. A recent systematic review that focussed on delirium was also reviewed to add to this discussion.

Discussion: While this review primarily investigated fascia iliaca compartment blocks, numerous research studies have been cited in this review to demonstrate an overview of the several different types of regional blocks available for fractured neck of femur patients. These include femoral nerve blocks, femoral obturator nerve blocks and pericapsular nerve group blocks as well as fascia iliaca compartment blocks. Some of these are administered by a single injection while others are provided via continuous infusion.

Conclusion: In patients with neck of femur fractures, fascia iliaca compartment blocks have consistently demonstrated success in reducing pain, decreasing the use of opioids, improving patient satisfaction and hastening healing. Although fascia iliaca compartment blocks appear to lower the likelihood of post-operative delirium, more research is needed to definitively determine the long-term cognitive effects. This review places a strong emphasis on the importance of pain treatment being tailored for each individual health care facility and patient.

Keywords: neck of femur, fascia iliaca compartment block, femoral obturator nerve block, continuous infusion fascia iliaca block, pain, pre-operative

Introduction

As we age, the risk of both falls and fractures increases. According to the Australian and New Zealand Hip Fracture Registry[1] approximately 19 000 patients in Australia and 4000 patients in New Zealand fall and fracture their hip every year. As the world population is aging, neck of femur (NOF) fractures will become more prevalent, necessitating comprehensive and adaptable interventions[2]. Sadly, for this elderly cohort, NOF fractures are associated with debilitating pain, functional limitations, adverse outcomes, including substantial morbidity that significantly impacts quality of life, and mortality[3]. Timely and effective pain management is crucial to alleviate suffering and facilitate optimal surgical outcomes and early mobilisation[4]. One approach that has gained attention in recent years is the fascia iliaca compartment block (FICB), an effective pre-operative analgesia for NOF fracture patients[5].

This integrative review looked at Australian and international literature, delving into the collective experience with FICB in adult NOF fracture patients to examine its effectiveness as a pre-operative analgesic technique. This integrative review aims to provide pre-operative, intra-operative and post-operative nurses with a deeper understanding of this regional anaesthetic technique.

Review methods

This review of literature has followed the Whittemore and Knafl[6] methodology for writing an integrative review, looking at different research methodologies and combining these in a way that allowed greater understanding and analyses of the phenomenon to be reviewed.

Literature search

To identify quality research for inclusion in this literature review, a comprehensive search was conducted across three reputable databases: CINAHL, MEDLINE and PubMed. The search strategy incorporated various combinations of keywords and phrases, including the Boolean operators AND/ OR, (Fascia Iliaca Block) AND (Neck of Femur) OR (hip fracture) AND (elderly) along with corresponding MeSH terms as appropriate in PubMed. The search was limited to studies focusing on the adult population and published in English from 2016 to the present to ensure the most current and relevant evidence. Following the initial search, a rigorous screening encompassed duplicate checks, title assessments and abstract reviews. Articles that were deemed potentially relevant based on these criteria were then subjected to a comprehensive evaluation using tools from the EQUATOR network.

Inclusion and exclusion criteria

A total of 15 papers, representing a range of evidence levels, met the inclusion criteria. The studies used a range of research approaches including, randomised controlled trials, retrospective and prospective investigations, cohort studies and a systematic review. Limiters on database searches were applied, including publication years 2016 to 2024, English language, peer reviewed and full text.

While papers published within the last five years were used in this review, a ten-year limiter was used to allow any salient or germinal research to be identified and older papers to be cited forward. Further inclusion criteria included primary research papers using quantitative, qualitative or mixed-methods methodology, and systematic reviews. Exclusion criteria included, papers of poor research quality, non-primary research, quality improvement studies, conference papers, reviews, opinion pieces and guidelines.

Data evaluation

Employing the EQUATOR critical appraisal tools, it was determined whether the identified papers were of good quality[7].

Discussion

Regional analgesic techniques like the FICB have become a compelling alternative for pain management in NOF fractures[8]. The research landscape supports the efficacy and multifaceted benefits of FICB[9]. FICBs have been administered in various clinical settings, including the emergency department, pre-hospital care and operating rooms[10].

Regional nerve blocks are administered by injecting local anaesthesia solution into specific anatomical landmarks by using guidance from either a nerve stimulator or ultrasound machine[11]. In Australia, NOF fracture patients may be offered either an FICB, a femoral nerve block (FNB) [11] or the more recently described pericapsular nerve group (PENG) block[12].

Thematic analysis of the studies included in this review revealed three themes – administration sites and techniques, pain management and cognitive function and delirium. This discussion will be presented under these themes and include implications of the research for perioperative nurses.

Administration sites and techniques

Administration sites

Three of the studies included in this review compared FICB to other pain management. Aprato et al. conducted a blind randomised control trial (n=120) comparing FICB with intra-articular hip injection (IAHI) for pain management in elderly patients (>65 years) with an intracapsular hip fracture. The results of this prospective study were intriguing. Aprato et al.[13] reported that IAHI provided better pre-operative pain management and significantly reduced pain in the Post Anaesthesia Care Unit (P<0.05); however, FICB offered superior analgesia on the first and second post-operative days for most patients (72.9%). These findings indicate that the block technique may influence pain relief and should be tailored to the patient's condition and the type of hip fracture.

Assessing the safety and potential side effects of FICB is critical in determining its overall utility. A prospective, double-blind, controlled study (n=154) by Zhou et al.[14] compared the analgesia of femoral obturator nerve block (FONB) and FICB in elderly patients (>65 years) with hip fractures and reported that the FONB group required significantly fewer post-operative analgesic drugs and experienced less nausea and vertigo than the FICB group (*P*=0.031 and *P*=0.034, respectively). In addition, post-operative function was significantly improved in the FONB group of patients ($p< 0.029$)[14]. These findings suggest that while FICB may be effective, alternative techniques like FONB may provide better pain management with fewer side effects in some patients reminding us of the need to assess every patient's individual circumstances and provide pain relief accordingly.

An Australian pilot study by Fahey et al. compared FICB (n=19), PENG (n=19) and FNB (n=14) administered as a single injection (often referred to as a 'one-shot' block) to patients with an NOF fracture. Fahey et al.[12] reported that there was no difference in maximum pain score reduction between the three groups. What was interesting was that inexperienced providers were able to successfully perform the PENG block[12]. As this was a small pilot study, it was recommended a larger randomised control trail be conducted to investigate this finding further[12].

Administration techniques

FICBs can be administered as a single injection ('one-shot') or continuously via a catheter. In their prospective, observational cohort study (n=107), Stephan et al.[15] compared one-shot FICB with continuous catheter FICB (CFICB) and found no significant differences in pain management, post-operative analgesia requirements or functional outcomes (*P*=0.067). In a single shot injection, it is envisaged that the patient will receive surgical intervention before the block wears off (approximately six hours) or a second one shot injection will be required.[15] These findings implied that single-shot FICB and CFICB may provide some options for variability in use, depending on the expected time to surgery.

A retrospective matched case-control study (n=40) by Rasappan et al. investigated the CFICB in geriatric hip fracture patients. According to Rasappan et al.[16], the CFICB group experienced much lower post-operative pain levels and consumed considerably fewer total opioids during the first three days after surgery than the control group (P<0.0001). However, the CFICB group had slower rehabilitation in the short term but no significant difference in function and mobility at one-year after surgery. These findings suggest that CFICB provides safe and effective post-operative pain relief without adversely affecting long-term outcomes.[16]

Pain management

Castillón et al.[17] conducted a prospective cohort study focusing on the effects of FICB on pain management and reported a statistically significant reduction in patients' visual analogue scale (VAS) pain scores after FICB administration (95%CI: 2.45–3.53%, *P*<.001).

In the following year, Ma et al.[18] carried out a prospective randomised controlled trial (n=88) examining the effects of CFICB on pain management in patients with hip fractures and reported that patients who received CFICB had considerably lower VAS pain scores than those who did not (*P*=0.023). This suggests that this method effectively lessened pain intensity. Additionally, participants in the CFICB group reported higher levels of satisfaction with their analgesic regimen (*P*<0.001) revealing not only enhanced pain management but also enhanced patient satisfaction with their pain reduction.[18]

Ma et al.'s findings are supported by a double-blinded, randomised clinical trial (n=90) carried out by Hao et al.[19] who also reported less pain after CFICB. Pre-operative pain was reduced in the experimental group (*P*<0.05)[19], suggesting that CFICB was successful in treating pain before surgery. Further findings revealed that there was no difference in side effects of analgesia; however, the length of stay was shorter in the CFICB group.[19]

In a retrospective observational trial (n=192) on patients with different forms of fragility hip fractures, Li et al.[20] also reported the pain-relieving capabilities of FNB finding statistically significant pain score reductions (*P*=0.006) and a notable decrease in the need for opioid analgesia after FNB. This reduction in opioid consumption is particularly relevant in the ongoing opioid crisis, highlighting the potential role for nerve blocks in mitigating this issue[20].

In a systematic review of literature conducted by Wan et al.[21], collective findings revealed that FICB could offer post-operative pain relief that was on par with or better than that offered by traditional analgesics, therefore reducing the need for additional analgesics and decreasing consumption of morphine and the incidence of nausea. Additionally, the review emphasised how FICB aided in earlier mobilisation and helped to prevent common complications such as post-operative delirium.[21] These results emphasise the advantages of incorporating FICB into pain management regimes.

The effectiveness of FICB in decreasing opioid consumption was further corroborated by two other studies. Schulte et al.[22] conducted a prospective randomised controlled trial (n=97) and demonstrated significantly fewer morphine milligram equivalents were consumed (13 vs. 17, *P*=0.04) and a significantly higher proportion of patients were discharged home (50.9% vs 32.5%, *P*=0.05) in the FICB group than the non-FICB group[22].

In a randomised prospective study, Thompson et al.[23] also found a statistically significant reduction in morphine usage (*P*<0.05) among patients (n=47) who received pre-operative FICB. Furthermore, this study also noted an improvement in patient-reported satisfaction as evidenced by the reduced demand for morphine and greater patient satisfaction levels (31%, *P*<0.01)[23]. Both authors recommend integrating FICB into institutional geriatric hip fracture pain protocols as an adjunctive pain control strategy[22,23].

More recently, a retrospective cohort analysis of patients with hip fractures (n=110) conducted by Houserman et al. in 2022, compared length of hospital stay, post-operative pain scores, time from admission to surgery, narcotics use and readmission within 30 days of surgery in patients who received CFICB and patients who did not. Houserman et al.[24] found that patients in the CFICB group had significantly shorter length of hospital stay than patients in the non-CFICB group (respectively, 3.9 and 4.8 days, *P*<0.001), and lower pain scores on the second and third day after surgery (*P*=0.019) suggesting that CFICB could accelerate healing and aid in pain management following surgery. However, Houserman et al.[24] also found that more patients in the CFICB group were readmitted within 30 days after surgery than in the non-CFICB group (P=0.047).

Similarly, Hao et al. explored the effects of FICB on post-operative pain and hip function in patients with hip fractures. Their prospective observational randomised trial (n=120) also revealed that the FICB group had significantly lower pain scores (*P*<0.05) at rest and with movement and more rapid recovery of hip function after surgery[25]. The incidence of post-operative complications and adverse events did not differ significantly between the FICB and control groups (*P*=0.13).[25]

Cognitive function and delirium

In a double-blind randomised controlled trial (n=127) Wennberg et al.[26] investigated the impact of FICB on cognitive function in elderly patients with a single hip fracture and found that cognitive function deteriorated in fewer patients in the FICB group than in the non-FICB group. However, this result was not statistically significant.

Wennberg et al. also grouped participants into four groups according to level of cognitive impairment and compared the dose of prehospital pain medicine administered. While there was no significant difference between groups with mild, moderate and no cognitive impairment, it was found that the mean dose of prehospital pain medicine given to patients with severe cognitive impairment was significantly lower than the mean dose given to patients with higher levels of cognitive function (4.02mg and 6.43 mg respectively)[26]. This highlighted the importance of behavioural pain assessment with patients with severe cognitive impairment as they are likely to have communication difficulties[26].

Hao et al.[19] carried out a double-blind randomised clinical trial (n=90) to investigate the impact of CFICB on post-operative delirium and found a lower occurrence of post-operative delirium in the CFICB group than the non-CFICB group (13.9% vs 35.7%, *P*=0.018). These findings suggested that pre-emptive analgesia via CFICB positively impacted post-operative delirium by providing more effective pain relief and mitigating the risk of delirium.[19]

A very recent systematic review, conducted by Lay et al. in 2024 in Australia, looked at delirium in 21 research studies (n=5096) of patients

following fractured NOF. While the results indicated some positive effects of FICB, the sample sizes were small and there is an urgent need for larger research trials to closely investigate possible preventative connections between regional blocks and delirium[27].

Implications for perioperative nurses

This review has contributed to the expanding body of knowledge for perioperative nurses, revealing that FICB, FOB, PENG blocks are effective pain management options for NOF patients.

FICB could be viewed as a useful pre-operative analgesic for patients with NOF fractures, either as a single shot or continuous infusion. Studies indicate that FICB administration has the potential to lower the use of opioids, reduce the incidence of post-operative delirium and improve patient outcomes. These outcomes have a huge impact on the perioperative nurse's ability to provide safe care for patients in both the PACU and ward areas.

The learning in this review aids in informing perioperative nurses of some of the options open to their patients and gives valuable insights into possible pain management outcomes both before arrival and after leaving the operating suite. In particular, the association between cognitive impairment and analgesia, and pain assessment methods should be investigated in more detail to enable individualised pain management plans.

Conclusion

This integrative review of literature examining FICB in hip fracture patients has revealed that pre-operatively, FICB reduces pain, lowers opioid use and enhances patient satisfaction. The reviewed studies consistently reported superior pain relief in patients who received FICB compared to those who received conventional analgesia. FICB was also associated with reduced opioid consumption, which is crucial considering the potential adverse effects of opioids in the elderly population. Additionally, FICB was found to shorten hospital stays and improve patient satisfaction due to better pain control and earlier mobilisation.

However, the studies also indicated that alternative techniques such as FNB, FONB and PENG blocks may also benefit some patients. CFICB also effectively controlled pain but may cause short-term rehabilitation delays. Research also emphasises the importance of personalised pain assessment and management, particularly for patients with cognitive impairment. FICB may help reduce the risk of post-operative delirium, but further research is needed regarding its long-term cognitive effects.

Current Australian and international research encourages clinicians to consider incorporating FICB into multimodal pain management strategies tailored to individual patient needs and preferences, and emphasises the need for further high-quality research to validate and refine the role of FICB and other regional blocks in the comprehensive care of NOF fracture patients.

Declaration of conflicting interests

The authors have declared no competing interests with respect to the research, authorship and publication of this article.

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References

1. Australian and New Zealand Hip Fracture Registry (ANZHFR). Welcome to the Australian and New Zealand hip fracture registry [Internet]. Sydney; ANZHFR: 2022 [cited 2024 Apr 12]. Available from: www.anzhfr.org
2. Gadhvi C, Bean D, Rice D. A systematic review of fear of falling and related constructs after hip fracture: Prevalence, measurement, associations with physical function and interventions [Internet]. BMC Geriatr. 2023[cited 2024 Apr 12];23(1):385. DOI: 10.1186/s12877-023-03855-9.
3. Verma UK, Dhamnaskar N, Kulkarni RV, Archik S, Kataria J, Khatri A et al. Prospective evaluation of quality of life and function after surgical management of femoral neck fractures in elderly patients [Internet]. Asian J Orthop Res. 2022[cited 2024 Apr 12];7(2):9–15. DOI: 10.13140/RG.2.2.16660.17289
4. Kaye AD, Urman RD, Rappaport Y, Siddaiah H, Cornett EM, Belani K. Multimodal analgesia as an essential part of enhanced recovery protocols in the ambulatory settings [Internet]. J Anaesthesiol Clin Pharmacol. 2019[cited 2024 Apr 12];35(Suppl 1):S40–S45. DOI: 10.4103/joacp.JOACP_51_18
5. Marenghi NM, Pilson HT-P, Halvorson JJ. Advances in geriatric hip fractures: Pre-operative considerations and tips to optimize outcome [Internet]. J Orthop Trauma. 2021[cited 2024 Apr 12];35(Suppl 5):S32–S37. DOI: 10.1097/BOT.0000000000002234
6. Whittemore R, Knafl K. The integrative review: Updated methodology [Internet]. J Adv Nurs. 2005[cited 2024 Apr 12];52(5):546–53. DOI: 10.1111/j.1365-2648.2005.03621.x
7. Buccheri RK, Sharifi C. Critical appraisal tools and reporting guidelines for evidence-based practice [Internet]. Worldviews Evid Based Nurs. 2017[cited 2024 Apr 12];14(6):463–72. DOI: 10.1111/wvn.12258 14 (6): 463–72

8. Senthil K, Kumar P, Ramakrishnan L. Comparison of pericapsular nerve group block versus fascia iliaca compartment block as postoperative pain management in hip fracture surgeries [Internet]. Anesth Essays Res. 2021[cited 2024 Apr 12];15(4):352–6. DOI: 10.4103/aer.aer_119_21
9. Kim CH, Yang JY, Min CH, Shon HC, Kim JW, Lim EJ. The effect of regional nerve block on perioperative delirium in hip fracture surgery for the elderly: A systematic review and meta-analysis of randomized controlled trials [Internet]. Orthop Traumatol Surg Res. 2022[cited 2024 Apr 12];108(1):103151. DOI: 10.1016/j.otsr.2021.103151
10. Raatiniemi L, Magnusson V, Hyldmo PK, Friesgaard KD, Kongstad P, Kurola Jet al. Femoral nerve blocks for the treatment of acute pre-hospital pain: A systematic review with meta-analysis [Internet]. Acta Anaesthesiol Scand . 2020[cited 2024 Apr 12];64(8): 1038–47. DOI: 10.1111/aas.13600
11. Cooper AL, Nagree Y, Goudie A, Watson PR, Arendts G. Ultrasound-guided femoral nerve blocks are not superior to ultrasound-guided fascia iliaca blocks for fractured neck of femur [Internet]. Emerg Med Australas. 2019[cited 2024 Apr 12];31(3):393–8. DOI: 10.1111/1742-6723.13172
12. Fahey A, Cripps E, Ng A, Sweeny A, Snelling PJ. Pericapsular nerve group block for hip fracture is feasible, safe and effective in the emergency department: A prospective observational comparative cohort study [Internet]. Emerg Med Australas. 2022[cited 2024 Apr 12];34(6):884–91. DOI: 10.1111/1742-6723.14013
13. Aprato A, Audisio A, Santoro A, Grosso E, Devivo S, Berardino M et al. Fascia-iliaca compartment block vs intra-articular hip injection for preoperative pain management in intracapsular hip fractures: A blind, randomized, controlled trial [Internet]. Injury. 2018 [cited 2024 Apr 12];49(12):2203–8. DOI: 10.1016/j.injury.2018.09.042
14. Zhou Y, Zhang WC, Chong H, Xi Y, Zheng SQ, Wang G et al. A prospective study to compare analgesia from femoral obturator nerve block with fascia iliaca compartment block for acute preoperative pain in elderly patients with hip fracture [Internet]. Med Sci Monit. 2019[cited 2024 Apr 12];25:8562–70. DOI: 10.12659/MSM.915289
15. Stephan SR, Garlich JM, Debbi EM, Johnson CR, Polakof LS, Noorzad AS et al. A comparison in outcomes of preoperative single-shot versus continuous catheter fascia Iliaca regional anesthesia in geriatric hip fracture patients [Internet]. Injury. 2020[cited 2024 Apr 12];51(6):1337–42. DOI: 10.1016/j.injury.2020.04.024
16. Rasappan K, Chua ITH, Tey JBL, Ho SWL. The continuous infusion fascia iliaca compartment block: A safe and effective analgesic modality in geriatric hip fracture patients [Internet]. Arch Orthop Trauma Surg. 2021[cited 2024 Apr 12];141:29–37. DOI: 10.1007/s00402-020-03450-2
17. Castillón P, Veloso M, Gómez O, Salvador J, Bartra A, Anglés F. Fascia iliaca block for pain control in hip fracture patients [Internet]. Rev Esp Cir Ortop Traumatol. 2017[cited 2024 Apr 12];61(6):383–9. DOI: 10.1016/j.recot.2017.07.004
18. Ma Y, Wu J, Xue J, Lan F, Wang T. Ultrasound-guided continuous fascia iliaca compartment block for pre-operative pain control in very elderly patients with hip fracture: A randomized controlled trial [Internet]. Exp Ther Med. 2018[cited 2024 Apr 12];16(3):1944–52. DOI: 10.3892/etm.2018.6417
19. Hao J, Dong B, Zhang J, Luo Z. Pre-emptive analgesia with continuous fascia iliaca compartment block reduces postoperative delirium in elderly patients with hip fracture: A randomized controlled trial [Internet]. Saudi Med J. 2019[cited 2024 Apr 12];40(9):901–6. DOI: 10.15537/smj.2019.9.24483
20. Li J, Dai F, Chang D, Harmon E, Ibe I, Sukumar N et al. A practical analgesia approach to fragility hip fracture: A single-center, retrospective, cohort study on femoral nerve block [Internet]. J Orthop Trauma. 2019[cited 2024 Apr 12];33(4):175–9. DOI: 10.1097/BOT.0000000000001391
21. 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 [Internet]. Pain Res Manag. 2020[cited 2024 Apr 12]:8503963. DOI: 10.1155/2020/8503963
22. Schulte SS, Fernandez I, van Tienderen R, Reich MS, Adler A, Nguyen MP. Impact of the fascia iliaca block on pain, opioid consumption and ambulation for patients with hip fractures: A prospective, randomized study [Internet]. J Orthop Trauma. 2020[cited 2024 Apr 12];34(10):533–8. DOI: 10.1097/BOT.0000000000001795
23. Thompson J, Long M, Rogers E, Pesso R, Galos D, Dengenis R.C et al. Fascia iliaca block decreases hip fracture postoperative opioid consumption: A prospective randomized controlled trial [Internet]. J Orthop Trauma. 2020[cited 2024 Apr 12];34(1):49–54. DOI: 10.1097/BOT.0000000000001634
24. Houserman DJ, Raszewski JA, Palmer B, Chavan B, Sferrella A, Campbell M. The impact of the fascia iliaca block beyond perioperative pain control in hip fractures: A retrospective review [Internet]. Geriatr Orthop Surg Rehabil. 2022[cited 2024 Apr 12];13:21514593221099107. DOI: 10.1177/21514593221099107
25. Hao C, Li C, Cao R, Dai Y, Xu C, Ma L et al. 2022 Effects of perioperative fascia iliaca compartment block on postoperative pain and hip function in elderly patients with hip fracture [Internet]. Geriatr Orthop Surg Rehabil. 2022[cited 2024 Apr 12];13:21514593221092883. DOI: 10.1177/21514593221092883
26. Wennberg P, Möller M, Herlitz J, Kenne Sarenmalm E. Fascia iliaca compartment block as a preoperative analgesic in elderly patients with hip fractures – effects on cognition [Internet]. BMC Geriatr. 2019[cited 2024 Apr 12];19(1):1–8. DOI: 10.1186/s12877-019-1266-0
27. Lay N, Foley P, Allen J. The effectiveness of preoperative delirium prevention in intermediate to high-risk older surgical patients: A systematic review [Internet]. J Clin Nurs. 2024[cited 2024 May 15];33(5):1666–83. DOI: 10.1111/jocn.17020