

Efficacy of Analgesic Methods for Hip Fractures

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PICOT: In elderly patients, how do opioids compare to femoral nerve blocks in controlling hip fracture pain within the emergency department?

Falls and the Elderly

A simple fall can be extremely detrimental to the health an elderly client. Falls are the leading cause of injury-related visits to the emergency departments in the United States and the primary cause of accidental death in elderly patients. More than 90 percent of hip fractures occur as a result of these falls (Fuller, 2000). Pain following hip fracture has been associated with delirium, depression, sleep disturbance, and decreased response to interventions for other disease processes (Abou-Setta et al., 2011). Therefore, it is important to treat and manage acute pain effectively. Treatment of pain may require opioids, which present complications that include diminished emotional response, altered mental status, nausea, vomiting, constipation, and respiratory depression (Eisenberg, 2011). Alternative treatments for pain are increasingly necessary, especially for this population that has more extensive health care considerations.

Opioids

Opioids are a class of drugs naturally found in the opium poppy plant. The chemical structure found in this plant can relax the body and relieve pain. Opioids bind to and activate opioid receptors on cells located in the brain, spinal cord, and other organs in the body. When opioids attach to these receptors, they block pain signals sent from the brain to the body and release large amounts of dopamine (NIH, 2018).

Prescription opioids such as hydrocodone, oxycodone, morphine, codeine, and fentanyl are all widely used for pain relief. More than 191 million opioid prescriptions were dispensed to American patients in 2017, despite the side effects and widely known risk of addiction (CDC, 2017). Opioids are still the most used method for managing pain in the hospital setting because they are extremely effective and easy to use.

Opioids can have unintended physical consequences for the elderly. Opioid risk factors include: breathing complications, confusion, drug interaction problems, nausea, constipation, and increased risk of falls, which can be very dangerous in the elderly population. The U.S. Pharmacist urges healthcare officials to “be cautious” when prescribing opiates to the elderly due to age-related renal function decline, prohibiting their bodies from effectively clearing the opiates from their systems (AgingInPlace, 2019).

Femoral Nerve Blocks

A nerve block is an anesthetic injection used to stop a pain signal along a specific distribution of nerve (RadiologyInfo.org, 2018). The femoral nerve can be easily accessed through the groin area and the block can be safely placed with the help of an ultrasound (Healthwise, 2018). The needle should be placed adjacent to the lateral aspect of the femoral nerve, below the fascia iliaca or between the two layers of the fascia iliaca that surround the femoral nerve (NYSORA, 2019). Once the block is in place, the leg and hip should be partially or totally numb. Although a femoral nerve block is commonly used for surgical operations, it can also be extremely effective for pain control. This can be beneficial for the patient during their time in the Emergency Department (ED) following a fall because their body often has to be manipulated and moved in order to perform X-rays of the hip. This can cause severe pain and discomfort to the patient.

Acquisition of External Evidence

My sources were obtained by first developing a PICOT (population, intervention, comparison, outcome, time) question, then distinguished important keywords that would refine my results in a nursing focused database, the Cumulative Index to Nursing and

Allied Health Literature (CINAHL). Keywords utilized in the CINAHL search engine included “elderly patient or elderly client,” “opioids and femoral nerve blocks,” “hip fracture pain,” and “emergency department or emergency room.” Studies were selected based on their currency, relevance, and credibility. From these results, the PICOT question was refined to reflect current available data and create a well-rounded evidence-based recommendation. Further evaluation for study size, selection criteria, length, factors, and confounding variables was then performed. Systematic reviews were assessed to ensure the same, if not higher, standards of study evaluation existed.

Summary of External Evidence

Various sources were used to gather data on which analgesic method effectively manages hip fracture pain in the elderly patient during Emergency room visits. Riddell, Ospina, & Holroyd-Leduc (2016) performed a systematic review to provide updated evidence for the use of femoral nerve blocks as a pain management technique for older hip fracture patients in the ED. The strength of this systematic review was the relevance to the PICOT question and scrutiny of the studies chosen. The review included a risk of bias assessment for different aspects of each study. However, all studies included in the systematic review used different assessment tools, assessment timelines, and control types. Approximately half of the studies, single-injection femoral nerve blocks were used and in the other half continuous femoral nerve blocks were used. This systematic review consolidates current knowledge that femoral nerve blocks appear to be an effective option to manage acute pain following hip fractures in the elderly population.

The study performed by Morrison et al. (2016) compared the outcomes of regional nerve blocks and standard analgesics after a hip fracture. The strengths of this

study were its size and length, with 161 patients from April 2009 to March 2013.

Although the study was large, a high level of scientific rigor was maintained throughout. The weakness of this study was the lack of guideline appropriate to opioid therapy. There is no evidence to say if individuals in the control group received adequate opioid therapy. Additionally, the study consisted of a single-injection femoral block in the ED and then the placement of a continuous iliaca block by an anesthesiologist 24 hours later. Because of these factors, only the first half of the study, the placement of the single block and assessment of its effect, was pertinent to the PICOT question. This study concluded that femoral nerve blocks performed by emergency physicians following continuous fascia iliaca placed by anesthesiologists are feasible and result in superior outcomes.

A systematic review done by Ritcey et al. (2015) looked at nine different randomized control trials that compared standard pain management with three-in-one femoral nerve blocks, traditional femoral nerve blocks, and fascia iliaca compartment blocks for elderly patients with hip or femoral neck fractures in the ED. This systematic review presents the results of each study very clearly and does a good job of tailoring clinical practice recommendations to the ED. Additionally, in most of the studies, the same opiate was administered, eliminating some variability between studies. However, this systemic review included some studies with small sample sizes and the effectiveness of pain management was measured differently in each study. Additionally, the review includes information about femoral neck fractures, which is not pertinent to the PICOT. The systematic review found that regional nerve blocks for hip fractures have a benefit in reducing pain and the need for IV opiates.

A small observational study was performed by Beaudoin et al. (2010) to determine the feasibility of ultrasound-guided femoral nerve blocks and examine its effectiveness in controlling hip fracture pain for elderly patients in the ED. Although this study was conducted with the primary purpose of determining feasibility of femoral nerve blocks, not efficacy of pain control, the study was very detailed. The significance of each step and results were explained. While the study had a very small sample size and isn't as applicable to the PICOT question, the study was very clinically relevant. The study concluded that ultrasound-guided femoral nerve blocks are feasible to perform in the ED and provide significant and sustained decreases in pain score.

Beaudoin, Haran, and Liebmann (2013) performed a randomized control study to compare the efficacy of three-in-one femoral nerve blocks to standard treatment with parenteral opioids for pain control in elderly patients with hip fractures in the ED. This study was extremely well designed. In order to eliminate confounding variables each patient received IV morphine, the study was double blind, and patients in the control group received a placebo injection of normal saline. The study also analyzed and presented statistical significance of data well. One of the weaknesses of this study was the variation in amount and frequency of IV morphine each patient received. Some patients who didn't receive femoral nerve blocks could have achieved the same level of analgesia because they received more opioids. Still, the study concluded that standard pain management with parenteral opioids alone provided ineffective pain control in patients with severe pain from their hip fractures.

Clinical Practice Recommendations

Nurses have many different roles in patient care, one of the most important being advocating for patients. Even though nurses cannot perform femoral nerve blocks they can suggest it as a first line pain management technique in the ED to lessen the need of opioids. It is an easy, quick procedure that all emergency physicians are capable of doing. Nurses can assist by setting up equipment needed for procedure, educating the patient, and standing by during the procedure.

Nurses play an important role in directing care for the patient by using the working relationships they've built with physicians to advocate for patients. Nurses can emphasize the importance of pain control and patient safety using evidence-based findings. Nurses should encourage the implementation of a meta-analysis covering the difference in pain control methods for elderly patients with hip fractures in the ED. A meta-analysis would allow nurses to look at all of the data concerning hip fracture pain, opioids, and femoral nerve blocks. From there nurses can advocate for their patients based upon the interpretation of data.

Conclusion of Evidence

Overall gaps in the body of evidence include a lack of objective measurement for pain. Studies administered medications and judged the efficacy of treatments based on subjective self-reports of pain. During a fall sustained injuries can be extensive and many acute pains can arise, making it more difficult to assess the efficacy of femoral artery blocks. Additionally, many elderly patients live with chronic pain and it can be difficult to differentiate the chronic pain from acute during assessments. Therefore, patients who live with chronic pain have the potential to skew data. Furthermore, many studies used different nerve blocks; even though the concept behind each is the same there are

variations in placement and technique. Currently, there is no definitive way to test femoral nerve blocks independently and assess pain objectively.

Femoral nerve blocks as an adjunctive to opioids provide superior pain relief than opioids alone (Beaudoin, Haran, & Liebmann, 2013). However, femoral nerve blocks do not have the ability to eliminate the use of opioids altogether and patients risk experiencing the adverse side effects of both treatment methods. For many patients, the nerve block can be more uncomfortable than receiving opioids. It would be difficult and somewhat implausible to study and use nerve blocks clinically devoid of other analgesics.

Pain relief for the elderly following a fall is much more manageable with a femoral nerve block. Femoral nerve blocks in conjunction with opioids are more effective in controlling hip fracture pain than opioids alone. Nurses should educate physicians about the benefits of femoral nerve blocks and assist in their administration. It is much safer for the patient when large amounts of opioids can be avoided and a greater level of pain management can be reached. Nurses are instrumental in implementation of hospital policy and could use this information to create policies and procedure that promote safer, more effective pain management in the ED. The health care community's knowledge of pain assessment is limited, but uncontrolled pain does greatly affect patient experience and patient satisfaction scores.

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