Femoral Nerve Blocks in Total Knee Arthroplasty: Literature Review

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Anesthesia comes with benefits and disadvantages, like anything else in the world. The most agreed-upon benefit of anesthesia is that individuals are satisfied with the little to no pain they experience after administering anesthesia. The disadvantages are that anesthesia can come with side effects and prolong many activities that individuals would instead do right away once the anesthesia wears off. Like any other medication, different anesthetics serve different purposes for various reasons, the most discussed ones: local, general, and regional anesthesia. Total knee arthroplasty, or total knee replacement, is a painful procedure requiring anesthesia due to the unbearable pain it brings to the individual. A common anesthetic used in total knee arthroplasties is femoral nerve blocks. Anesthesiologists suggest targeting the specific region in the body using a femoral nerve block to aid in pain control. The purpose of this literature review is to target the benefits and drawbacks that come with receiving femoral nerve blocks. This literature review compares postoperative pain control using femoral nerve blocks. As the medical field consistently evolves and adjusts to the modern day, it is imperative to also consistently research the effectiveness of the medications administered to individuals.

Pain control after total knee arthroplasty: A randomized trial comparing local infiltration anesthesia and continuous femoral block

This article discusses the effectiveness of pain control after receiving local infiltration anesthesia versus continuous femoral block anesthesia regarding individuals demanding analgesics and morphine within the first 24 hours post-operatively (Tekgül et al., 2022). The researchers conducted a randomized study consisting of 40 patients that had a total knee

arthroplasty completed. However, some received a femoral nerve block, and some received local infiltration anesthesia, which consisted of a mixture of medications, such as ropivacaine, ketorolac, and epinephrine. The patients knowingly had access to morphine via patient-controlled analgesics, if necessary, they were also assessed for pain at rest and activity with the use of the numeric scale (0-10) for every hour, if awake, for 24 hours (Tekgül et al., 2022). The primary purpose of this article is to analyze and compare the effectiveness of administering local versus femoral block anesthesia in total knee arthroplasties.

Key Points

The research method used in this article was a randomized study; the participants chose randomization. The researchers had 40 tickets, of which 20 were labeled “F” for femoral nerve blocks and 20 were labeled “LIA” for local infiltration anesthesia. The researchers then placed the tickets into their nontransparent envelopes, and each participant could draw from one envelope. The researchers excluded the anesthesiologist performing the anesthesia on the participants from the randomization process of the procedures (Tekgül et al., 2022).

The data in this study consisted of the participant's demographics, primary outcome, secondary outcome, and ancillary analysis. The participant's baseline data consisted of the sex, mean age range, weight in kilograms, height in centimeters, mean body mass index, American Society of Anaesthesiologists classification, and whether the participant was undergoing the procedure due to rheumatoid arthritis or osteoarthritis for both the femoral block and local anesthesia group (Tekgül et al., 2022). The data in the primary outcome consisted of both randomized groups' average pain score at rest and average pain score upon movement, which were interpreted using the numeric rating scale for pain (Tekgül et al., 2022). The data in the

secondary outcome consisted of both randomized groups' total morphine usage throughout the 24 hours of the study (Tekgül et al., 2022). The ancillary analysis consisted of both randomized groups numeric rating scales reporting the pain to be less than a five at rest and upon movement and the pain to be greater than a seven at rest and upon movement (Tekgül et al., 2022).

The data overall was not considered statistically significant. The primary outcome regarding the average degree of pain intensity for the first 24 hours postoperative was similar to low pain at rest and upon movement for participants (Tekgül et al., 2022). The data in the secondary outcome regarding the average of morphine used via patient-controlled analgesic pump during the first 24 hours postoperative was reported to be 10 milligrams higher in femoral blocks than the local infiltration anesthesia group, also taking into consideration that the morphine per kilogram was parallel in both groups, not making it significant enough (Tekgül et al., 2022). A p-value in this study regarding the significance level chosen for each analysis resulted in a significance level of $p < 0.02$ (Tekgül et al., 2022). In the ancillary analysis, the reporting of pain is more significant than seven at rest more than once during the 24 hours was five times greater in the group with femoral blocks than the local anesthesia group. However, pain reporting is more significant than a seven upon activity reported by 1 out of 20 participants in the local anesthesia group and 7 out of 19 participants in the group with femoral blocks (Tekgül et al., 2022).

The researcher’s conclusion of the study was that there was no group between the two, local anesthesia and femoral block, that took precedence; it remained unclear which one was more effective in receiving (Tekgül et al., 2022). The pain participants reported was similar in that it was hard for researchers to distinguish which group had a more beneficial outcome (Tekgül et

al., 2022). The researchers mentioned the costly effects of local infiltration anesthesia as it is much cheaper and less complex to administer rather than femoral blocks (Tekgül et al., 2022).

Assumptions

The primary assumption of the researcher's thinking is that local infiltration anesthesia is considered superior over femoral blocks due to the benefits of it being less complex and more affordable (Tekgül et al., 2022). The researchers proposed this after conducting the study and not noticing a significant difference between the two randomized groups. The femoral block procedure had more steps involved in the process, and patients that received the femoral block had to have a urinary bladder catheter inserted (Tekgül et al., 2022). Based on using fewer tools, resulting in cost-effectiveness and a more straightforward process, one can assume that local anesthesia is superior to receiving femoral blocks.

Deficit/Conclusion

This nursing student fails to accept the researcher’s reasoning that local anesthesia could be considered superior to the femoral block due to the lack of information in this article (Tekgül et al., 2022). The implication of this article suggests that some elements of the study could change to amplify results and potentially assist in making a significance in the data. The research method should remain the same and separate participants into designated groups by tickets and drawing their envelopes (Tekgül et al., 2022). The change that can happen in the research is that the number of participants is too small, and seeing an alteration in the data, potentially more participants could make a difference. Another proposed change for further research in the study should cover at least 48 hours postoperative to assist in making a significance in the data. The

proposed changes that this nursing student suggested has the potential to narrow down whether the femoral block or local anesthesia has more of an effect on pain control after total knee arthroplasty.

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Conclusion

Write a conclusion here in your overall paper. Follow the MEAL paragraph formatting and use Grammarly.com. Provide a summary/conclusion of the analysis of all three articles. Discuss how the information can improve:

- Patient outcomes
- Nursing practice

- Evidence-based practice/Quality Improvement efforts
- Healthcare as a whole

References

Tekgül, Z. T., Bilgin, M. U., & Kayalı, C. (2022). Efficiency of femoral nerve block for recovery after primary total knee arthroplasty. *Ain-Shams Journal of Anesthesiology*, *14*(1), 1-9. https://doi.org/10.1186/s42077-022-00217-2