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A Three-arm Randomized Clinical Trial Comparing Continuous Femoral Plus Single-injection Sciatic Peripheral Nerve Blocks versus Periarticular Injection with Ropivacaine or Liposomal Bupivacaine for Patients Undergoing Total Knee Arthroplasty.

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Author information

Abstract

BACKGROUND: Multimodal analgesia is standard practice for total knee arthroplasty; however, the role of regional techniques in improved perioperative outcomes remains unknown. The authors hypothesized that peripheral nerve blockade would result in lower pain scores and opioid consumption than two competing periarticular injection solutions.

METHODS: This three-arm, nonblinded trial randomized 165 adults undergoing unilateral primary total knee arthroplasty to receive (1) femoral catheter plus sciatic nerve blocks, (2) ropivacaine-based periarticular injection, or (3) liposomal bupivacaine-based periarticular injection. Primary outcome was maximal pain during postoperative day 1 (0 to 10, numerical pain rating scale) in intention-to-treat analysis. Additional outcomes included pain scores and opioid consumption for postoperative days 0 to 2 and 3 months.

RESULTS: One hundred fifty-seven study patients received peripheral nerve block (n = 50), ropivacaine (n = 55), or liposomal bupivacaine (n = 52) and reported median maximal pain scores on postoperative day 1 of 3, 4, and 4.5 and on postoperative day 0 of 1, 4, and 5, respectively (average pain scores for postoperative day 0: 0.6, 1.7, and 2.4 and postoperative day 1: 2.5, 3.5, and 3.7). Postoperative day 1 median maximal pain scores were significantly lower for peripheral nerve blockade compared to liposomal bupivacaine-based periarticular injection (P = 0.016; Hodges-Lehmann median difference [95% CI] = -1 [-2 to 0]). After postanesthesia care unit discharge, postoperative day 0 median maximal and average pain scores were significantly lower for peripheral nerve block compared to both periarticular injections (ropivacaine: maximal -2 [-3 to -1]; P < 0.001; average -0.8 [-1.3 to -0.2]; P = 0.003; and liposomal bupivacaine: maximal -3 [-4 to -2]; P < 0.001; average -1.4 [-2.0 to -0.8]; P < 0.001).

CONCLUSIONS: Ropivacaine-based periarticular injections provide pain control comparable on postoperative days 1 and 2 to a femoral catheter and single-injection sciatic nerve block. This study did not demonstrate an advantage of liposomal bupivacaine over ropivacaine in periarticular injections for total knee arthroplasty.

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