Peri-articular Liposomal Bupivacaine Offers No Benefit over Bupivacaine in Total Knee Arthroplasty

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Introduction: Peri-articular injection of liposomal bupivacaine has been rapidly adopted in many centers as part of multimodal pain management after total knee arthroplasty (TKA). The purpose of this study was to compare the efficacy of liposomal bupivacaine to standard bupivacaine.

Methods: We enrolled 162 patients undergoing primary TKA in this prospective, randomized, double-blinded clinical trial. 88 patients were randomized to liposomal bupivacaine (experimental group) and 74 patients were randomized to standard bupivacaine (control group). Both groups received spinal anesthesia and otherwise identical surgical approaches, pain management and rehabilitation protocols. Patient-reported visual analogue pain scores (VAS, in mm), narcotic consumption and narcotic-related side effects within 96 hours after surgery were recorded. The Knee Society Score (KSS) and Short-Form 12 (SF-12) were recorded preoperatively and 4-6 weeks after surgery. The results were analyzed using Mann-Whitney-U test.

Results: There were no significant preoperative differences in demographics, comorbidities, pain and function scores between the groups. The respective median VAS scores for the experimental and control groups were day1-am: 29 vs. 35 (p=0.28), day1-pm: 33 vs. 33 (p=0.48), day2-am: 28 vs. 34 (p=0.66), day2-pm: 29 vs. 30 (p=0.54), day3: 24 vs. 29 (p=0.99), day4: 25 vs. 22 (p=0.98). There was no significant difference between the groups in overall narcotic consumption (105 vs. 94 mg, respectively p=0.99), narcotic-related side effects and functional outcomes at 4-6 weeks (KSS 75 vs. 63.5, respectively, p=0.81, SF-12 physical 36.7 vs. 37.3, respectively p=0.95; SF-12 mental 55.1 vs. 56.5, respectively, p=0.8). The cost of liposomal bupivacaine per case was $315 vs. $4.92 for standard bupivacaine.

Conclusion: Liposomal bupivacaine, in this prospective, randomized clinical trial, did not demonstrate superior efficacy to standard bupivacaine for the outcomes measured, especially given the cost differential. As a result of this study, we have discontinued use of this medication for TKA at our institution.