

LIPOSOMAL BUPIVACAINE VS LONG-ACTING LOCAL ANESTHETICS FOR ADDUCTOR CANAL BLOCK AFTER TOTAL KNEE ARTHROPLASTY: META-ANALYSIS

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INTRODUCTION

- Total knee arthroplasty is associated with substantial postoperative pain
- Adductor canal block is widely used to improve analgesia while preserving quadriceps function
- Liposomal bupivacaine is designed to prolong analgesia for up to 72 hours
- Its added benefit over standard long-acting local anesthetic solutions for adductor canal block remains uncertain

METHODOLOGY

Databases searched: PubMed, Embase, Cochrane Library, and Web of Science

Included studies: randomized controlled trials in total knee arthroplasty comparing liposomal bupivacaine versus conventional long-acting local anesthetics for adductor canal block

Outcomes: postoperative pain at rest at 24, 48, and 72 hours

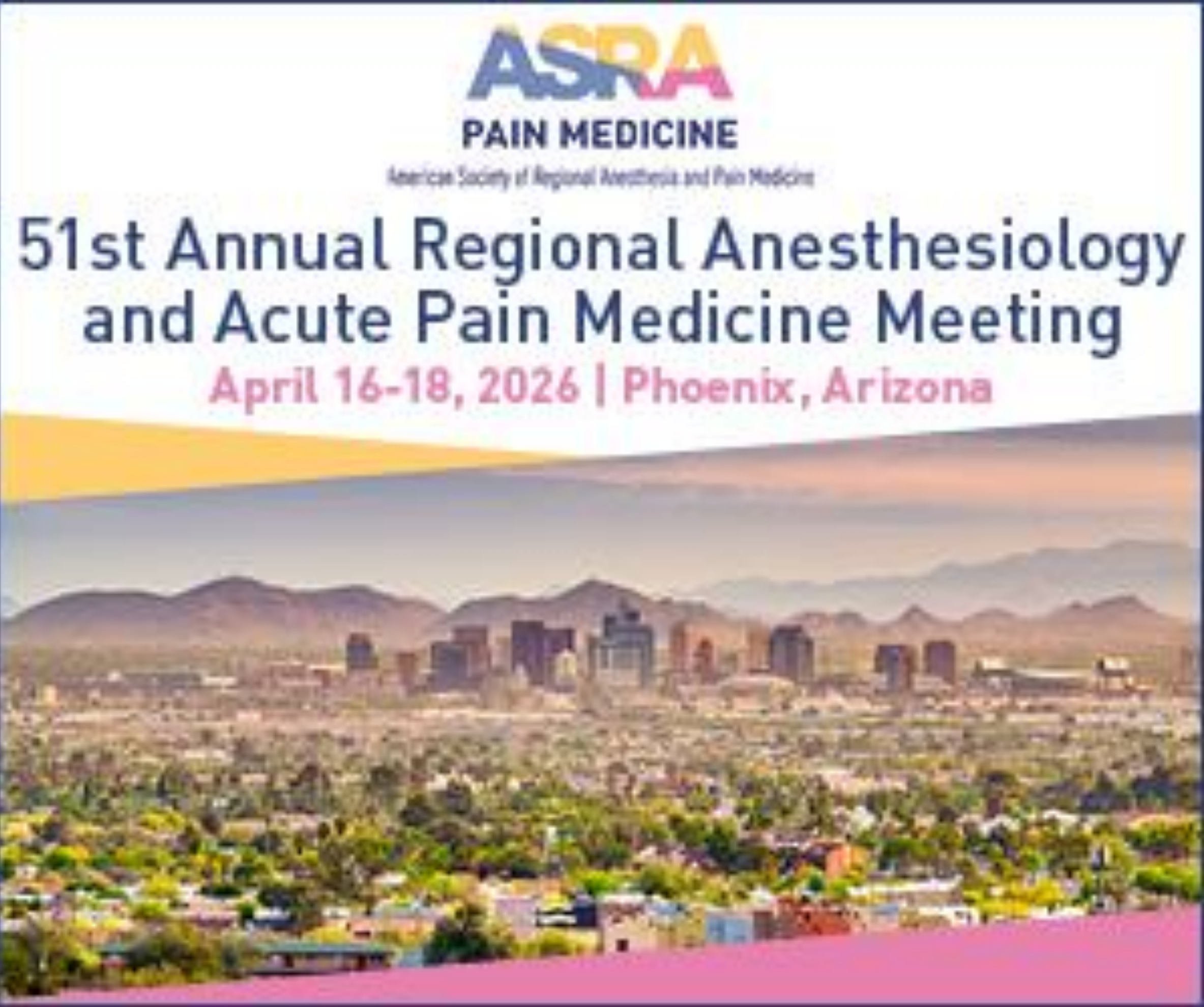
Analysis: random-effects meta-analysis performed in R

Between-study variance: estimated with restricted maximum likelihood

Heterogeneity: assessed with tau-squared and I-squared

Additional metrics: prediction intervals calculated

Pooled confidence intervals: computed with the Hartung–Knapp–Sidik–Jonkman method following current Cochrane recommendations



CONCLUSION

- LB + bupivacaine** showed small late pain reductions only
- Plain LB** showed no consistent benefit
- Overall, **no clinically meaningful superiority of LB** for adductor canal block after total knee arthroplasty
- Larger, standardized RCTs are needed**

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