Liposome bupivacaine in ankle blocks decreases opioid consumption compared to bupivacaine alone or general anesthesia after corrective osteotomy for hallux valgus

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Background and goal of study

Corrective osteotomy for hallux valgus is a common outpatient surgery, often accompanied by severe and sustained postoperative pain.¹ Efforts to improve postoperative pain management have increased opioid prescriptions that can lead to tolerance, worst treatment outcomes, addiction and overdose deaths.^{2,3} Nerve blocks have been used to reduce pain, but have a limited duration of effect. A novel formulation of liposome bupivacaine injectable suspension has been FDA approved for infiltration during surgery, but is not yet approved for use in nerve blocks. The primary objective of this study was to determine whether a mixture of bupivacaine liposome injectable suspension + bupivacaine HCl in ankle blocks decreases postoperative pain and opioid consumption after corrective osteotomy compared to bupivacaine HCl alone or general anesthesia (GA).

Materials and methods

After EC and FAGG approval (EUDRACT 2016-000961-22), 40 subjects scheduled for hallux valgus repair were randomized to receive ultrasound-guided ankle blocks of the posterior tibial and deep peroneal nerves with a mixture of bupivacaine 0.5% (2.5 mL) and liposome bupivacaine suspension 1.3% (5mL) per nerve (n=12), bupivacaine 0.5% alone (7.5 mL) per nerve (n=14), or GA (n=14). All groups received multimodal analgesia consisting of IV dexamethasone, ketorolac, acetaminophen and opioids. Onset and duration of blockade and pain scores were assessed up to 7 days after surgery. Worst pain in the first postoperative week was analyzed with adjustment over time by generalized estimating equations (GEE). Total opioid use in the first postoperative week was analyzed by 1-way ANOVA.

Figure 1: Postoperative pain

Results and Discussion

Ankle blocks significantly reduced pain scores in the first postoperative week (GEE $p=0.016$) (Figure 1). Mean total opioid consumption was highest in the general anesthesia group (48 mEq), and lowest in the liposome bupivacaine mixture group (8 mEq) ($p < 0.001$) (Figure 2). Mean total opioid consumption was also lower in the bupivacaine alone group compared to the general anesthesia group, however, the difference failed to reach the Bonferroni-corrected level of statistical significance (28 mEq, $p = 0.116$).

Figure 2: Mean opioid consumption
***LB vs GA $p < 0.001$

Conclusion

Addition of liposome bupivacaine to bupivacaine in ultrasound guided posterior tibial and deep peroneal nerve (ankle) blocks reduced pain and mean opioid consumption after corrective osteotomy for hallux valgus.

References

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