Liposomal Bupivacaine + Bupivacaine versus Bupivacaine Interscalene Nerve Block Effect on Pain after Arthroscopic Rotator Cuff Repair: A Randomized Control Trial

Christopher Alexander Rivera-Pintado, Pietro Michele Gentile, Devyn Russo, Michael Robert Boniello, Krystal M Hunter, Dhiren Soni, Matthew Kleiner, Gregory M Dodson, Catherine Julia Fedorka[1]
[1]Cooper University Hospital

INTRODUCTION: Interscalene nerve blocks (ISB) have improved postoperative pain control following shoulder surgery. Bupivacaine has historically been the primary medication used in ISBs. Liposomal bupivacaine has more recently been approved by the FDA for use in interscalene nerve blocks. This formulation allows for potentially a longer duration of analgesic effect as the bupivacaine is stored in liposomes, which allows for slow release over time. This study aims to identify the effect ISBs using Bupivacaine alone (B) versus liposomal Bupivacaine+Bupivicaine (LBB) on postoperative pain control after an arthroscopic rotator cuff repair.

METHODS: A prospective, double-blinded randomized controlled trial was conducted from January 2020-April 2023. One-hundred-six patients were randomized into the B only group (15cc of Bupivacaine and 10cc of normal saline) versus the LBB group (10cc liposomal bupivacaine + 15cc bupivacaine). Inclusion criteria included patients above 18 years of age undergoing an arthroscopic rotator cuff repair. Exclusion criteria included: pre-existing liver disease, allergies to either drug, or chronic preoperative narcotic use. All patients received an ISS by a board certified anesthesiologist. Demographics, comorbidities, daily morphine milligram equivalents (MME) consumed, and daily visual analog scale (VAS) scores for 14 days was collected. Data analysis included chi-square, T-tests, and Mann-Whitney U test. P value < 0.05 threshold was utilized.

RESULTS: Eighty-five patients were included in the final analysis. Forty-five patients were randomized to the LBB group and 40 to the B group. No significant differences were noted between age, sex, and ASA scores. During the first 14 days postoperatively, patients in the LBB group consumed less total MMEs with a median (IQR) of 22.5 (3.75, 78.75) compared to the B group of 31.9 (0.00, 73.13), but this did not reach statistical significance ($p= 0.993$). However, at postoperative day 2, the LBB consumed a lower median (IQR) MMEs of 0.00 (0.00, 0.00) compared to the B group of 0.00 (0.00, 15.00) reaching statistical significance ($p=0.027$). No significant difference was found between groups on individual daily MMEs consumed at any timepoint aside from postoperative day 2. Patients receiving liposomal bupivacaine did not demonstrate statistically significant improvement in VAS scores on postoperative days 1 through 14.

DISCUSSION AND CONCLUSION:

The use of liposomal bupivacaine in ISBs does not lead to a significant difference in opioid consumption and VAS scores compared to standard bupivacaine during the first 14 days following rotator cuff repair or arthroscopy shoulder surgery except for on postoperative day 2. Consideration should therefore be taken into whether the use of liposomal bupivacaine is cost effective given its higher cost compared to bupivacaine.