

33. A COMPARISON OF THE CLINICAL EFFICACY OF SINGLE-SHOT "3-IN-1" FEMORAL NERVE BLOCK WITH ROPIVACAINE AND BUPIVACAINE AFTER UNILATERAL TOTAL KNEE REPLACEMENT

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Introduction: Pain after total knee replacement (TKR) is severe and difficult to treat with oral analgesics.[1] Ropivacaine has an improved safety profile when compared with bupivacaine.[2] Comparison of the clinical efficacy of intra-operative single-shot "3-in-1" femoral nerve block (FNB) using ropivacaine and bupivacaine for post TKR analgesia has not been done. While bupivacaine at 0.25% had been proven to be effective in post TKR analgesia,[3] the relative therapeutic ratios of the two local anesthetics for lower limbs block had not been established and the dose of ropivacaine as an alternative for bupivacaine for 3 in 1" FNB is still unclear. To compare the clinical efficacy of intra-operative single shot "3-in-1" FNB in combination with general anesthesia using ropivacaine 0.25%, ropivacaine 0.5% with bupivacaine 0.25% for total knee replacement.

Methods: We performed a randomized, double-blind study in 48 patients for elective TKR under general anesthesia. Patients were randomized to 1 of 4 groups (C: sham block, R1: "3-in-1" FNB using 30 ml of ropivacaine 0.25 %, R2: "3-in-1" FNB using 30 ml of ropivacaine 0.5%, B: "3-in-1" FNB using 30 ml of bupivacaine 0.25%). Verbal Pain Score (VPS) both at rest and movement were assessed for 48 hours after TKR. (0 = none, 1 = mild, 2 = moderate, 3 = severe.). Total morphine consumption and its associated side effects, duration of hospitalization after operation was also compared.

Results: There were no differences in patients' physical characteristics, intra-operative morphine usage, operation time, tourniquet time or length of hospitalization between the four groups. When compared with group C, the VPS was significantly lower in group R1, R2 and B at 1st, 4th, 8th, 24th and 48th hour after TKR ($p < 0.05$). The morphine requirement of group R1, R2 and B were also significantly lower when comparing with group C up to 48 hours post-operatively ($p < 0.05$)(see Table 1). There were no significant differences in VPS and postoperative morphine requirement at any time between group R1, R2 and B.

Conclusion: "Three-in-one" femoral nerve block with ropivacaine provided efficacy that was clinically comparable to that of bupivacaine up to 48 hours after TKR. Increasing the concentration of ropivacaine from 0.25% to 0.5% failed to improve the clinical efficacy of "3-in-1" femoral nerve block.

Table 1: Cumulative morphine consumption of the four groups over 48 hours.

Time	Group C	Group R1	Group R2	Group B
1 hour	5.4± 2.3	2.4± 1.7*	2.0± 1.2*	2.4± 2.2*
4 hour	13.2± 5.6	8.0± 5.3*	7.2± 4.8*	6.2± 3.5*
8 hour	20.5± 9.6	11.2± 5.6*	11.4± 5.5*	8.5± 3.8*
24 hour	42.5±10.9	26.4±11.4*	26.8± 9.7*	26.2± 9.7*
48 hour	68.8±23.1	37.5±20.5*	35.4±12.4*	39.4±24.6*

* $p < 0.05$ vs group C

1) Hugh WA, Spencer SL, Paul DW, et al. Peripheral nerve blocks improve analgesia after total knee replacement surgery. *Anesth Analg* 1998; 87: 93-7.

2) Scott DB, Lee Alistair, Fagan D, Bowler GMR. Acute toxicity of ropivacaine compared with that of bupivacaine. *Anesth Analg* 1989; 69: 563-9.

3) Singelyn FJ, Deyaert M, Joris D, Pendeville E, Gouverneur JM. Effects of intravenous patient-controlled analgesia with morphine, continuous epidural analgesia, and continuous three-in-one block on postoperative pain and knee rehabilitation after unilateral total knee arthroplasty. *Anesth Analg* 1998; 87: 88-92.