Comparison of different doses and concentrations of bupivacaine and lidocaine combination for infraclavicular brachial plexus block

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Introduction: The aim of the study is to determine the duration of action and ideal effective doses of bupivacaine-lidocaine combination in different concentrations for infraclavicular brachial plexus block.

Methods: The Ethics Committee of Istanbul Bilim University approved this study. Patients were randomized into 3 groups, consisting of 20 patients and applied 15 mL 0.5% bupivacaine- 15 mL 2% lidocaine to the first, 15 mL 0.5% bupivacaine- 15 mL 2% lidocaine with 30 mL saline to the second, 10 mL 0.5% bupivacaine- 10 mL 2% lidocaine with 40 mL saline to the third group. Onset and duration of motor and sensory blocks, additional analgesic requirements, postoperative Visual Analogue Scale scores were recorded.

Results: Groups were similar according to demographics, time until operation after block, operation time, perioperative and postoperative mean arterial pressure, heart rates, SpO₂ values. Initiation of sensory block time was significantly longer in Group 1 than the others. Motor block initiation time was significantly longer in Group 1 than the other groups. Postoperative sensory and motor block performance time was significantly shorter in group 1 than the other groups. Additional analgesic requirement and Visual Analogue Scale scores were highest in Group 1 (p<0.05).

Conclusion: In the current study we observed that by increasing the volume of local anesthetic solution, the time for initiation of sensory and motor block decreases and the duration of both sensory and motor block increases. We concluded that using decreased amount of bupivacaine-lidocaine combination to 60 mL, may cover the surgery and is efficient for postoperative analgesia.

Table 1: Demographic characteristics of groups

		Group I	Group II	Group III	p
Age	mean±s.d.	49.6±19.0	41.5±17.7	37.7±19.8	0.143
Weight	mean±s.d.	73.9±11.9	74.9±15.1	72.7±12.6	0.879
ASA	I n (%)	12 (60%)	12 (60%)	16 (84%)	0.177
	II n (%)	8 (40%)	8 (40%)	3 (16%)	

Table 2: Additional analgesic requirement with preoperative midazolam and fentanyl doses

		Group I	Group II	Group III	p
Additional analgesic requirement	No n (%)	10 (50%)	20 (100%)	16 (84%)	0.001
	Yes n (%)	10 (50%)	0 (0%)	3 (16%)	
Midazolam (mg)	mean±s.d.	2.2±0.3	2.3±0.4	2.2±0.4	0.384
Fentanyl (mcg)	mean±s.d.	74.0±11.9	74.8±15.3	71.3±13.1	0.709

Table 3: Comparison for the time to onset of sensory and motor block with duration of surgery and tourniquet

		Group I	Group II	Group III	p
Onset of sensory block (sec)	mean±s.d.	158.4±20.4	106.2±32.2	79.6±41.0	0.000
Onset of motor block (sec)	mean±s.d.	209.3±34.3	141.4±30.5	120.8±45.6	0.000
Time to start surgery after blockage (min)	mean±s.d.	24.8±5.7	25.9±7.6	28.5±6.9	0.279
Duration of surgery (min)	mean±s.d.	34.0±14.1	52.3±34.5	46.9±33.3	0.463
Duration of tourniquet (min)	mean±s.d.	35.3±16.8	48.3±31.2	36.9±26.2	0.434

Table 4: Comparison for the time to dissolution of sensorial and motor block

		Group I	Group II	Group III	p
Time to dissolution of sensory block (min)	mean±s.d.	285.9±27.4	399.5±50.6	350.1±43.4	0.000
Time to dissolution of motor block (min)	mean±s.d.	330.5±27.3	434.3±49.0	396.3±47.0	0.000