PD-40. THE EPIDURAL ëTOP-UPí: PREDICTORS OF INCREASE OF SENSORY BLOCKADE

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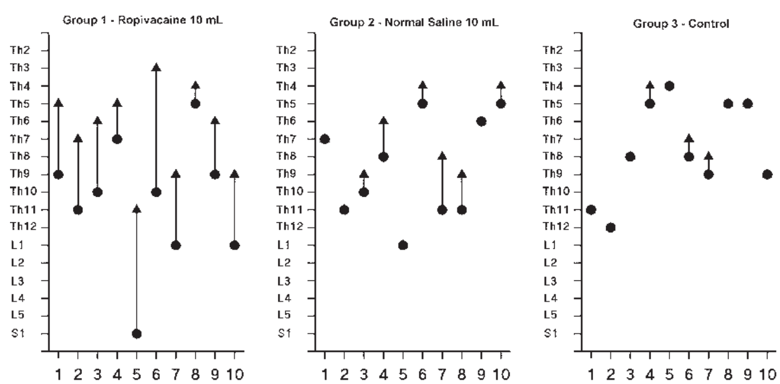
Background: When using central neuraxis blockade, the Maximum Level of Sensory Blockade (MLSB) can be extended by administering an epidural top-up. In combined spinal epidural anesthesia (CSE), where the initial dose is given into the subarachnoid space, it has been demonstrated that the increase in the MLSB following an epidural top-up may be partly attributed to a volume effect: the injectate compresses the dural sac, resulting in a cephalad shift of cerebrospinal fluid that already contains local anesthetic from the previous subarachnoid injection (1-3). Assuming that local anesthetic injected into the epidural space will in part be transferred into the subarachnoid space, we wanted to investigate if a volume effect plays a significant role when administering an epidural top-up after an initial epidural loading dose. In addition, we developed a prognostic model including different patient factors to predict the increase in sensory blockade.
Methods: We studied 30 patients (18-80 yr, ASA physical status I-III, non-pregnant) scheduled for lower limb surgery under lumbar epidural anesthesia. The study was approved by the ethics committee of our institution and informed consent was obtained from all patients. After an epidural loading dose of 75 mg ropivacaine 0.75 %, the patients were randomly assigned to one of three groups containing 10 individuals each. After the maximum level of sensory blockade had been established, patients received either an epidural top-up with 10 ml ropivacaine 0.75 % (group 1) or saline (group 2), or no epidural top-up (group 3, control). Subsequently, sensory blockade was assessed at five-min intervals for 30 min by a blinded observer. In addition to the effect of the epidural top-up on the MLSB, we studied age, height, weight, lean body mass (LBM), body surface area (BSA), gender, and the maximum number of segments blocked (MNSB = the number of segments counted from S5 upward up to and including MLSB) of the first phase as possible prognostic variables. The association between each prognostic variable and increase in MNSB was quantified using univariate linear regression analysis (SPSS, release 9.0). Significantly associated variables (based on t test with P-value £ 0.05) were evaluated, in addition to the intervention, by multivariate linear regression modelling to determine their independent contribution to the increase in level of MLSB.
Results: The MLSB increased significantly in the patients receiving an epidural top-up with ropivacaine but not in the patients receiving normal saline (Figure). Sensory block extension as a result of the epidural top-up was inversely related to the number of segments blocked as a result of the initial epidural injection, and female gender was associated with a smaller increase in the MLSB.
Conclusions: When using epidural ropivacaine, the extension of sensory blockade after administering an epidural top-up is primarily caused by a local anesthetic effect and not by a volume effect. Under the conditions of this study, predictors of the increase in sensory blockade are: the presence of ropivacaine in the top-up injectate, the number of segments blocked at the time of epidural top-up, and gender.

1. Br J Anaesth 1992; 69:457-60
2. Anesth Analg 1996; 83:382-6
3. Anesth Analg 1999; 88:810-4



Individual data on the MLSB during phase 1 (●) and phase 2 (▲). The horizontal axis represents individual patients and the vertical axis represents the dermatomal level.

	Group 1 (n = 10)	Group 2 (n = 10)	Group 3 (n = 10)
Phase 1 Maximum sensory level Onset time (min)	T10 (T5-S1) 14 ± 7.0	T9 (T5-L1) 14 ± 5.8	T8 (T4-T12) 15 ± 5.5
Phase 2 Maximum sensory level Onset time (min)	T6 (T3-T11) 11 ± 5.2	T7.5 (T4-L1) 4 ± 4.6	T7.5(T4-T12) 2 ± 2.4
Segmental increase	4 (1-7)	1 (0-3)	0 (0-1)