Hypobaric versus hyperbaric bupivacaine for unilateral spinal anaesthesia for elective knee arthroplasty: a randomized assessor-blinded study.

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Background. The challenge of the spinal anaesthesia technique is to control the spread of local anaesthetic through the cerebrospinal fluid. Unilateral spinal anaesthesia can be achieved using either hyper- or hypobaric solutions.

We conducted a study to test the hypothesis that hyperbaric bupivacaine solution is more reliable compared with hypobaric for unilateral sensory blockade in patients kept in lateral decubitus position for 20 min after the injection of spinal anaesthetic.

Methods. A single centre prospective randomized assessor blinded study. Sixty patients scheduled for elective total knee arthroplasty were included. Hypobaric 7.5 mg (5ml of bupivacaine 0.15%) and hyperbaric 7.5 mg (1.5 ml of bupivacaine 0.5% in Dextrose) were used. Patients were kept on site for 20 min after injection and were turned supine thereafter.

The study primary endpoint was to determine the likelihood of unilateral sensory blockade 15 min after turning supine. The secondary outcomes included the level and the extent of sensory blockade, the degree of motor blockade, and additional anaesthesia and vasopressor requirements.

Results. 15 min after turning supine, the sensory blockade remained unilateral in 7 patients in the hyperbaric and in 16 patients in the hypobaric group (p=0.0326). Unilateral motor block was achieved in 18 patients in both groups (60 %). Eleven (36.7%) patients in hyperbaric and 8 patients (26.7%) in the hypobaric group received additional epidural boluses of plain bupivacaine (p=0.58).

Conclusions. Unilateral anaesthesia is more successfully achieved with 0.15% hypobaric than 0.5% hyperbaric bupivacaine. There is no difference in the level and the extent of the sensory blockade between the study groups.