

# Correspondence



## *Optimizing bupivacaine dosing for Cesarean delivery - I*

To the Editor:

I enjoyed reading the study by Bryson *et al.*<sup>1</sup> in which the investigators compared low-dose isobaric spinal bupivacaine to a standard hyperbaric dose for Cesarean delivery. Their purpose was to identify if the lower dose, when combined with spinal fentanyl and morphine, could preserve efficacy while reducing the incidence of hypotension. Bryson *et al.* found that using a 4.5-mg dose of "isobaric" bupivacaine did not reduce the incidence of hypotension. In fact, both the 4.5-mg isobaric and the 12-mg hyperbaric groups had the same average cervical sensory level (C8) and, by inference, an equivalent sympathetic block. These results are somewhat surprising, since Van de Velde *et al.*<sup>2</sup> previously found that hyperbaric bupivacaine 6.5 mg was associated with a lower incidence of hypotension when compared with 9.5 mg of hyperbaric bupivacaine. In that study, spinal blocks were performed in the sitting position (as in the study by Bryson *et al.*) and were augmented by epidural saline, if necessary, as part of a continuous spinal-epidural (CSE) technique.

The study by Bryson *et al.* shows that reducing the dose of bupivacaine in water will not ameliorate the hypotension associated with spinal anesthesia. A lower bupivacaine dose might lessen the incidence of respiratory compromise, since motor power is better preserved. One possible explanation is that 0.5% bupivacaine in water is actually slightly hypobaric, and the drug is rendered further hypobaric when mixed with fentanyl.<sup>3</sup> This would account for the cervical levels of anesthesia achieved. In a study examining the effects of posture and baricity on spinal anesthesia, Hallworth *et al.* added 1.6 mL normal saline and 0.4 mL D5W to 8 mL of 0.5% bupivacaine to make an isobaric solution as measured by a density meter.<sup>4</sup> A more easily obtained local anesthetic solution isobaric to CSF in pregnancy is 1% tetracaine in water.<sup>5,6</sup> It is prepared by adding 2 mL sterile water to a 20 mg ampoule of lyophilized tetracaine.

Continuous spinal-epidural may be preferred to spinal anesthesia for Cesarean delivery, when preserving hemodynamic stability or avoiding airway compromise are particularly important, for example, in pre-eclamp-

tic patients.<sup>7</sup> The best features of each technique may be preserved. An isobaric spinal solution allows unhurried placement of the epidural catheter through the CSE needle in the sitting position. A cocktail of low-dose isobaric spinal tetracaine, augmented by intrathecal fentanyl, morphine, and epidural saline or local anesthetic, as necessary, may provide the most effective and balanced approach to these problems.

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### References

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