hypnosis as we did using the BIS monitor neither did they calculate the amount of the anaesthetic consumed with each technique.

In our study, we used an objective monitor to quantify hypnosis, thus ensuring comparable levels of anaesthesia in both groups intraoperatively. We maintained BIS values between 35 and 45, which are lower than those required to prevent awareness, because in studies specifically relating BIS to sevoflurane, values lower than 50 reliably indicated an adequate depth of anaesthesia [7]. Another reason is that our patients were breathing spontaneously and lower BIS values might minimize movement or EMG interference.

Increased sevoflurane requirements to maintain predetermined BIS values might account for the longer awakening time in the TI group. Immediate co-ordination ability and subtle manual dexterity assessed by the 'picking up matches test' were affected by exposure to higher concentrations of sevoflurane in the TI group as shown by the difference in the test results immediately after arousal. No significant difference in performing the test was observed thereafter. In fact, in short-duration procedures such as half an hour or so, inhalational anaesthetic uptake is mostly limited to the vessel-rich group and recovery times for different inhalational anaesthetics or for different amounts of the same anaesthetic will be similar. Nonetheless, less amount of anaesthetic for the same procedure costs less money. This may explain the fact that the different sevoflurane consumption did not affect nausea and vomiting or duration of stay in PACU between the two groups. The lack of blinding, not feasible for technical reasons, may be considered a limitation of our study. However, the amount of anaesthetic consumed, the 'picking up matches' test and BIS values consist objective recordings, minimizing the bias in interpretation of our results.

Today, improved recovery times leading to safe reduction of turnaround times and optimization of resource utilization are becoming the target of the so-called 'fast track' anaesthesia [1]. Under the present study design, use of the LM was associated with lower sevoflurane requirements and consumption, shorter awakening time and shorter time to remove the airway device but similar duration of stay in the PACU when compared with the TI group.

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References

1. Eger EI, White PF, Bogetz MS. Clinical and economic factors important to anaesthetic choice for day-case surgery. *Pharmacoeconomics* 2000; **17**: 245–262.
2. Paraskeva A, Papilas K, Fassoulaki A, Melemeni A, Papadopoulos G. Physostigmine does not antagonize sevoflurane anesthesia assessed by bispectral index or enhances recovery. *Anesth Analg* 2002; **94**: 569–572.
3. White PF, Song D. New criteria for fast-tracking after outpatient anesthesia: A comparison with the modified Aldrete's scoring system. *Anesth Analg* 1999; **88**: 1069–1072.
4. Taguchi M, Watanabe S, Asakura N, Inomata S. End-tidal sevoflurane concentrations for laryngeal mask airway insertion and for tracheal intubation in children. *Anesthesiology* 1994; **81**: 628–631.
5. Aantaa R, Takala R, Muittari P. Sevoflurane EC50 and EC 95 values for laryngeal mask insertion and tracheal intubation in children. *Br J Anaesth* 2001; **86**: 213–216.
6. Cork RC, Depa RM, Standen JR. Prospective comparison of use of the laryngeal mask and endotracheal tube for ambulatory surgery. *Anesth Analg* 1994; **79**: 719–727.
7. Aime I, Verroust N, Masson-Lefoll C *et al*. Does monitoring bispectral index or spectral entropy reduce sevoflurane use? *Anesth Analg* 2006; **103**: 1469–1477.

Epidural volume extension and role of baricity

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EDITOR:
I would like to congratulate the authors on a well-conducted trial, regarding a relevant clinical implication of epidural volume extension (EVE) [1]. It is concluded by the authors that EVE does not augment the sensory level of subarachnoid block induced with hyperbaric or plain bupivacaine. This is correctly enough inferred from their observation of statistically similar sensory levels at pre-defined time points between Groups A and B, and between Groups C and D. However, it might be more

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accurate to draw this conclusion after also comparing the maximum sensory level achieved and the time required to do so, between Groups A and B, and C and D. This is because the maximum sensory level may be achieved earlier with EVE, even though the eventual sensory levels with and without EVE could be the same.

My second observation is regarding the similarities that the authors draw between their findings and those of Yamazaki and colleagues [2]. I would like to point out that in the trial by Yamazaki and colleagues, the block was performed with patients in the lateral position and the epidural volume was injected 20 min after the intrathecal injection. The intrathecal spread and hence the sensory level after a subarachnoid block would be different for a patient in sitting position vs. one in lateral position. Consequently, the effect of EVE can also be expected to be different between varying patient position. More importantly, EVE has been shown to be a time-dependent phenomenon. When performed 20 min after intrathecal injection [3], it fails to augment the spinal block and even decreases the duration of spinal anaesthesia when performed after two segment regression of spinal block [4]. Hence the cause of failure of EVE in block augmentation with the trial of Yamazaki and colleagues cannot be compared to the present study.

Lastly, no observation is made on the method of confirming correct placement of the epidural catheter. Whether using clinical or radiological method, the confirmation of correct placement of epidural catheter for EVE-based trials is essential. With a non-functioning catheter the 'apparent' application of EVE would in fact be absent. This would definitely result in erroneous interpretation of the observations.

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References

1. Kucukguclu S, Unlugenc H, Gunenc F *et al*. The influence of epidural volume extension on spinal block with hyperbaric or plain bupivacaine for Caesarean delivery. *Eur J Anaesthesiol* 2007; **21**: 1–7.
2. Yamazaki Y, Mimura M, Hazama K, Namiki A. Reinforcement of spinal anesthesia by epidural injection of saline: a comparison of hyperbaric and isobaric tetracaine. *J Anesth* 2000; **14**(2): 73–76.
3. Mardirosoff C, Dumont L, Lemedioni P, Pauwels P, Massaut J. Sensory block extension during combined spinal and epidural. *Reg Anesth Pain Med* 1998; **23**(1): 92–95.
4. Trautman WJ 3rd, Liu SS, Kopacz DJ. Comparison of lidocaine and saline for epidural top-up during combined spinal-epidural anesthesia in volunteers. *Anesth Analg* 1997; **84**(3): 574–577.

Reply

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EDITOR:
We thank Dr Tyagi for her interest in our study and her comments [1]. In our study, after EVE, the segmental spread of spinal anaesthesia either with hyperbaric or plain bupivacaine and times to reach maximal dermatomal level were investigated. We found a significant difference in sensory block level between Groups A and C and it was mainly thought to be related to the baricity of the local anaesthetic. These findings were consistent with Yamazaki and colleagues' study, investigating the effect of EVE on spinal anaesthesia with hyperbaric or plain tetracaine in non-obstetric patients [2]. Similarly, time to reach T_4 was significantly shorter in the plain bupivacaine groups than in the hyperbaric bupivacaine groups. However, there was no significant difference between Groups A and B, and between Groups C and D. That is, although baricity did affect the time to reach the maximal dermatomal level, the addition of EVE to spinal anaesthesia did not offer any advantage in the enhancement of segmental spread of spinal block regardless of plain or hyperbaric bupivacaine use. Finally, we found a faster onset time and higher sensory block level in Groups C and D than in Groups A and B, and we believe that these effects were mainly related to the baricity of local anaesthetic, but not with the addition of EVE to spinal anaesthesia.

It has been speculated by Dr Tyagi that the effect of EVE could be expected to be different between

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