endotracheal tubes <7 mm (in these cases the 5-Fr Arndt EBB or Fogarty catheters are suitable). For our purposes, we adopted a 5.5-mm SLT, cut lengthwise, as an introducer. EZ-blocker bifurcation is about 6.5 mm large, but the blocker passed easily through the 5.5-mm tube due to full silicone-based lubrication and deformability of the cut tube. It might have proven difficult to use a tube <5.5 mm as an introducer. This limits the technique to pediatric patients for whom a smaller SLT is necessary.

Previous studies have proposed the extraluminal Arndt EBB placement for infants and small children.[6,7] Our experience demonstrated this approach feasibility even in larger children, exploiting the EZ-blocker fully. We believe that this EBB is easier to move and reposition than Arndt or Fogarty blockers when managed outside the tube lumen. Its Y-shaped design simplifies its placement because the 2-cuffed extensions expand and find their ways into the 2-stem bronchus. This EZ-blocker feature has been exploited also for its blind placement in adults.[8] Also, the EZ-blocker cuffs are larger than the 7-Fr Arndt EBB, especially helping the right-lung isolation. Finally, this technique can be useful if a small outer-diameter FOB is not available (a 1.8-2.5 FOB is necessary to fit with the inner lumen of 26-28 Fr DLTs).[9]

In conclusion, the extraluminal EZ-blocker placement can be an alternative to DLT even in pediatric patients.

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Assessing Effect of Remote Ischemic Preconditioning on Postoperative Cognitive Function After Cardiac Surgery Using Cardiopulmonary Bypass

To the Editor:

We read with respect the article by Hudetz et al[1] focusing on remote ischemic preconditioning (RIPC) during cardiac surgery to attenuate short-term postoperative cognitive impairment (PCI). To assess the effect of RIPC on PCI, the authors raise some risk factors as independent variables, such as age, sex, baseline cognitive performance, anesthesia duration, isoflurane and fentanyl dose, cardiopulmonary bypass (CPB) time, types of surgery, etc. However, in designing this pilot investigation, the other perioperative risk factors associated independently with PCI after cardiac surgery with CPB were missing.

First, the depth of anesthesia was not included in the data of patients for analysis. Strong evidence from animal experiments suggests that standard doses of routine anesthetics may produce long-lasting PCI that persists for weeks or months after anesthetic exposure.[2,3] Therefore, in cardiac surgery patients with CPB, a deep level of anesthesia also is a possible confounding factor that affects the risk of postoperative PCI and delirium. Brain function monitoring, such as the bispectral index, facilitates anesthetic titration and has been shown to reduce anesthetic exposure to decrease the risk of postoperative cognitive dysfunction after surgery.[4,5] Although isoflurane and fentanyl doses were similar between groups in the presence and absence of RIPC, this does not mean necessarily that the same depth of anesthesia was used because different patients have a different sensitivity to the anesthetic.

Second, we are not provided with details of patients' temperature management during CPB. In cardiac surgery, it is important also to note that postoperative neurocognitive function is associated with the choice of temperature regimen during CPB.[6] Compared with normothermia, hypothermia reduces tissue metabolic demands but may impair the autoregulation of cerebral blood flow and contribute to PCI.[7] Furthermore, the rate of rewarming also may influence development of PCI and delirium after cardiac surgery.

We agree, though, that the mechanisms responsible for PCI and delirium after cardiac surgery are multifactorial and involve inflammatory response to CPB. However, we are concerned that any imbalance in the above factors among patients undergoing cardiac surgery with CPB would have affected the accuracy of the results.

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Letter in Reply

To the Editor:

We thank Zhang et al[1] for their interest in our recent study.[2] The authors expressed concern that our postoperative cognitive impairment findings might have been influenced unduly by administration of different doses of anesthetics between patients receiving remote ischemic preconditioning and those who did not. From our perspective, this cannot be the case. Patients were randomized (using a Latin square design) to receive remote ischemic preconditioning or placebo before surgery. The identical anesthetic technique (induction with etomidate, fentanyl, and rocuronium; maintenance with isoflurane, fentanyl, and rocuronium) was used in all patients enrolled in our study regardless of randomization. The average end-tidal concentration of isoflurane and the total dose of fentanyl used during surgery were similar between groups. Postoperative administration of analgesics also was similar between groups (data not shown). Thus, it is highly unlikely that our results can be attributed to a difference in anesthetic delivery. The authors are correct that we did not use bispectral index monitoring to titrate anesthetics in our study. However, bispectral index monitoring most likely cannot be used as a quantitative index of anesthetic depth[3] and probably is unreliable during cardiopulmonary bypass in patients undergoing cardiac surgery.[4,5]

The authors[1] also are concerned that the conduct of cardiopulmonary bypass may have influenced our results. As mentioned in the manuscript, cardiopulmonary bypass was standardized so that there were no differences in bypass technique between remote ischemic preconditioning and control groups. Systemic hypothermia (30°C-32°C), use of mean arterial pressures between 55 and 70 mmHg, and maintenance of flow rates between 2.4 and 2.5 L/min/m^2 were used during cardiopulmonary bypass in all patients. Aortic cross-clamp and total cardiopulmonary bypass times were similar between groups. Rewarming was conducted in accordance with standard cardiopulmonary perfusion practice. We have no reason to suspect that there were any differences in rewarming time or the rate of rewarming between groups because our cardiopulmonary perfusionists were not aware of patient randomization nor were they involved in the study as coinvestigators. Thus, it is highly unlikely that fundamental differences in the conduct of cardiopulmonary bypass can explain the beneficial effects of remote ischemic preconditioning on postoperative cognitive impairment that we observed in our study.

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