Measurement of Cerebral Blood Flow during Hypothermic Cardiopulmonary Bypass

To the Editor—In our opinion, two related issues in the article by Ohsumi et al. need to be addressed. The cerebral blood flows (CBF) and metabolic rates for oxygen (CMRox) they report using the Kety-Schmidt technique are appropriate and similar to reports by our laboratory and that of Stephan et al., with the exception of the CBF (19 ml · 100 g⁻¹ · min⁻¹) they document during hypothermic cardiopulmonary bypass. During hypothermia, the patients in the study were significantly hypocarbic (mean PaCO₂ = 29.7 mmHg). This degree of hypocarbia will decrease CBF by approximately 25–30% in the context of a opioid-benzodiazepine anesthesia. Correcting for this hypocarbia, the CBF under normocarbic conditions (with alpha-stat management and hypothermia) would be closer to 25 ml · 100 g⁻¹ · min⁻¹. This value is similar to what our laboratory and that of Stephan et al. reported.

Second, and more importantly, Ohsumi et al. sell the Kety-Schmidt method short when comparing their results to those previously obtained with 133Xe clearance. Ohsumi et al. suggest in their discussion that the CBF and CMRox values they report are too high when compared to values reported with the 133Xe method. We would argue that the 133Xe values typically reported are too low, and the Ohsumi et al. values are correct. The Ohsumi et al. Kety-Schmidt-derived CBF and CMRox values are consistent with theoretical predictions and direct measurements in animals, unlike those commonly reported with 133Xe.

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