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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.*¹ need to be addressed. The cerebral blood flows (CBF) and metabolic rates for oxygen (CMR_{O₂}) they report using the Kety-Schmidt technique are appropriate and similar to reports by our laboratory² and that of Stephan *et al.*,³ 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 an opioid-benzodiazepine anesthesia.^{4,5} 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 laboratory² and that of Stephan *et al.*³ 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.^{6,7} Ohsumi *et al.* suggest in their discussion that the CBF and CMR_{O₂} 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.² The Ohsumi *et al.* Kety-Schmidt-derived CBF and CMR_{O₂} values are consistent with theoretical predictions and direct measurements in animals, unlike those commonly reported with ¹³³Xe.

David J. Cook, M.D.

Assistant Professor Anesthesiology

John D. Michenfelder, M.D.

Emeritus Professor of Anesthesiology

Mayo Medical School

Mayo Clinic

Rochester, Minnesota 55905

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