

other similar pharmacologic responses in the perinatal period, for instance ketamine requirement is much greater in infants under 6 months of age, and Lockhart and Nelson<sup>4</sup> suggested changes in neuronal density, incomplete myelination, or impaired axonal transmission as possible explanations. One may speculate that a common factor relating to neural maturity could explain both the larger local anesthetic dose requirement and the subsequent absence of sympathetic blockade. Dr. Dohi and his group have shed some welcome light on this puzzling feature of spinal anesthesia in the very young.

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### Clinical Significance of Perioperative T-wave Inversion

*To the Editor:*—Breslow *et al.*<sup>1</sup> showed that patients with perioperative T-wave changes did not have an increased incidence of adverse cardiac events in the immediate postoperative period. They did not present a long-term follow-up of these patients.

In a 1–2-yr follow-up of patients with unstable angina and new T-wave inversions of > 2 mm, a higher incidence of adverse cardiac events was observed by Haines *et al.*<sup>2</sup> Granborg *et al.*<sup>3</sup> found in a 3-yr follow-up that in patients suspected of acute myocardial infarctions, the number of leads with transient T-wave inversions as well as the sum of negative T-wave amplitudes significantly correlated with the rates of acute myocardial infarctions and death.

In the immediate postoperative period, most cardiac events are not associated with anginal pain. The patient with known or suspected coronary artery disease may have a significant intraoperative ischemic event leading to no externally detectable manifestations other than T-wave inversion.

In the study of Breslow *et al.*,<sup>1</sup> 40 out of 394 patients had known or suspected coronary artery disease. Although not stated in the report, it is likely that few or none of these patients had unstable angina. The incidence of significant ischemic events in the perioperative period under these circumstances is not known, but it is suspected

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*In reply:*—Dr. Jain has questioned whether perioperative T-wave abnormalities are associated with late cardiac complications (1–3 yr postoperative). This suggestion is based on data demonstrating a relationship between late

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### REFERENCES

1. Berkowitz S, Green B: Spinal anesthesia in children. *ANESTHESIOLOGY* 12:376–387, 1951
2. Singler RC: Pediatric regional anesthesia, *Pediatric Anesthesia*. Edited by Gregory GA. New York, Churchill Livingstone, 1983; pp 481–518
3. Abajian C, Mellish RWP, Browne AF, Perkins FM, Lambert DH, Mazuzan JE: Spinal anesthesia for surgery in the high risk infant. *Anesth Analg* 63:359–362, 1984
4. Lockhart CH, Nelson WL: The relationship of ketamine requirement to age in the pediatric patient. *ANESTHESIOLOGY* 40: 507–508, 1974

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to be quite low. Nine of 40 patients who had new T-wave abnormalities did not have adverse cardiac events in the perioperative period. If they were to be followed for 2–3 yr, it is possible that they would have higher morbidity and mortality than the remaining 31 patients. In addition, if the sample size had been significantly greater than nine, perioperative ischemic events may also have been detected.

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### REFERENCES

1. Breslow MJ, Miller CF, Parker SD, Walman AT, Rogers MC: Changes in T wave morphology following anesthesia and surgery: A common recovery room phenomenon. *ANESTHESIOLOGY* 64:398–402, 1986
2. Haines DE, Raabe DS, Gundel WD, Wackers FJT: Anatomic and prognostic significance of new T wave inversion in unstable angina. *Am J Cardiol* 52:14–18, 1983
3. Granborg J, Grande P, Pedersen A: Diagnostic and prognostic implications of transient isolated negative T waves in suspected acute myocardial infarction. *Am J Cardiol* 57:203–207, 1986

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cardiac complications and T-wave abnormalities in patients presenting with acute ischemic events (unstable angina, acute myocardial infarction).

Dr. Jain's comments are correct but not relevant to our