

### The Baroresponse and Cardiovascular Depression by Halothane in Infants

*To the Editor:*—Differences in cardiovascular physiology exist between neonatal and adult mammals.<sup>1</sup> Many of these differences are well-understood, while others require further investigation. The recent article by Wear, Robinson, and Gregory,<sup>2</sup> reporting their study of the baroresponse of adult and baby rabbits, is an important contribution in this field.

One of the conclusions made by the authors, however, is not supported by their data. They concluded that, because of the marked depression of the baby's baroresponse by halothane, the baby's ability to compensate for hypotension would be limited. The authors studied the animals' heart rate response to *hypertension* (the depressor baroresponse), not the response to *hypotension* (the pressor baroresponse). While the two are undoubtedly related, the authors present no evidence to indicate that studying one response enables an investigator to draw conclusions about the other.

Their data do indicate that halothane depresses systolic blood pressure more in baby than in adult rabbits. Similar observations with humans and other mammals have been reported, as have possible contributing factors.<sup>3-6</sup> An age-related difference in the baroresponse may indeed be an important contributing factor in the infant's cardiovascular depression by halothane. The data from this study, however, only suggest this to be a hypothesis and do not support it as a conclusion.

This point should be clarified, as it detracts from what was obviously a well-designed and executed experiment.

Anesthesiology  
58:387-388, 1983

*In reply:*—Dr. Friesen is correct; we did study the depressor response. We attempted to study the pressor response by administering nitroprusside, but the computer program would not handle the data without considerable revision. Hand calculation of data from a few animals plus the data of Abboud and associates<sup>1</sup> show that the pressor response is similar to the depressor response but is much flatter. In addition, we recently have shown that there is no change in heart rate in a group of preterm infants anesthetized with halothane who became hypotensive and had systolic blood pressure below 45 mmHg.<sup>2</sup> Both show that the ability of infants to respond to hypotension is less than their ability to respond to an increase in pressure. Therefore, we believe the

Perhaps Drs. Wear, Robinson, and Gregory will pursue their investigation further and examine age-related differences in halothane's effect on the response to hypotension.

ROBERT H. FRIESEN, M.D.  
*Assistant Clinical Professor of Anesthesiology  
and Pediatrics, University of Colorado,  
Department of Anesthesiology  
The Children's Hospital  
Denver, Colorado 80218*

#### REFERENCES

1. Friedman WF: The intrinsic physiologic properties of the developing heart. *Prog Cardiovasc Dis* 15:87-111, 1972
2. Wear R, Robinson S, Gregory GA: The effect of halothane on the baroresponse of adult and baby rabbits. *ANESTHESIOLOGY* 56:188-191, 1982
3. Nicodemus HF, Nassiri-Rahimi C, Bachman L, Smith TC: Median effective doses (ED<sub>50</sub>) of halothane in adults and children. *ANESTHESIOLOGY* 31:344-348, 1969
4. Diaz JH, Lockhart CH: Is halothane really safe in infancy? *ANESTHESIOLOGY* 51:S313, 1979
5. Cook DR, Brandom BW, Shiu G, Wolfson B: The inspired median effective dose, brain concentration at anesthesia, and cardiovascular index for halothane in young rats. *Anesth Analg (Cleve)* 60:182-185, 1981
6. Friesen RH, Lichtor JL: Cardiovascular depression during halothane anesthesia in infants: a study of three induction techniques. *Anesth Analg (Cleve)* 61:42-45, 1982

*(Accepted for publication September 3, 1982.)*

statement we made that the baby's ability to compensate for hypotension is true based on the above data.

We appreciate Dr. Friesen's remarks. We agree that more information is required to better define the pressor response in young animals and humans.

R. E. WARE, M.D.

S. ROBINSON, M.D.

G. A. GREGORY, M.D.

*Department of Anesthesia  
University of California,  
School of Medicine  
San Francisco, California 94143*