

# Correspondence

## Ketamine for Delivery

*To the Editor:*—As practicing obstetric anesthesiologists, we would like to take exception to Dr. Galloon's statement that "ketamine is less than an ideal anesthetic for delivery of a full-term pregnancy."<sup>1</sup> He bases his objections to the drug on his findings of ketamine-induced increases in uterine tone of second-trimester uteri, as well as on reports of depressed Apgar scores following the use of ketamine in anesthetic doses during delivery.

Extrapolation of data on uterine tone from the second-trimester to the parturient is probably invalid, and further extrapolation to the suitability of ketamine as an anesthetic agent for delivery unjustified. There is a significant difference between second-trimester and term uteri in both resting and active pressure, as well as oxytocin response. Resting pressure doubles in the prelabor period.<sup>2</sup> The evolution of active pressure is gradual until the thirty-sixth week of pregnancy, with an increase from less than 5 torr at 14 weeks to an average of 15 torr at 36 weeks. Thereafter, pressure increases rapidly to more than 30 torr at term and 100 torr in labor.<sup>3</sup>

Low-dosage ketamine produces excellent analgesia as well as amnesia in the mother without abolishing muscle tone or protective reflexes. Neonatal arterial pressures in the immediate postnatal period have been shown to be less depressed after ketamine than after thiopental induction.<sup>4</sup> Our comparisons of results of Scanlon's neonatal neurobehavioral tests of normal babies delivered both vaginally (after  $< .8$  mg/kg) and by elective cesarean section ( $< .1$  mg/kg) with results following thiopental ( $< .3$  mg/kg) gave statistically significantly more high scores after ketamine (Hodgkinson R, unpublished data). The quoted Apgar scores of Chodoff and Stella,<sup>5</sup> obtained following 0.15 mg/lb for vaginal delivery, and those reported by Peltz and Sinclair<sup>6</sup> for 1 mg/kg used for cesarean section, appear excellent. However, the minimum in-

formation needed to assess the effect on the Apgar score is a comparison of the effects of ketamine at various dosages with an alternative medication (e.g., thiopental) at the same hospital, using similar patients, by the same observer. Such a study should preferably be randomized and double-blind.

Finally, we feel strongly that theoretical hypotheses based on the effects of drugs on uterine tone should give way to the clinical assessment of the neonate in terms of survival rates, Apgar scores, neurobehavioral assessments, blood pressure, and other clinical modalities.

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### REFERENCES

1. Galloon S: Ketamine for obstetric delivery. *ANESTHESIOLOGY* 44:522-524, 1976
2. Caldeyro-Barcia R, Poseiro JJ: Physiology of the uterine contraction. *Clin Obstet Gynecol* 3:386-408, 1960
3. Csapo A: The diagnostic significance of the intrauterine pressure. *Obstet Gynecol Survey* 25:403-435, 1970
4. Marx GF, Cabe CM, Kim YI, et al: Neonatal blood pressures. *Anaesthetist* 25:318-322, 1976
5. Chodoff R, Stella JG: Use of CI-581, a phenylethylamine derivative, for obstetric anesthesia. *Anesth Analg (Cleve)* 45:527-530, 1966
6. Peltz B, Sinclair DM: Induction agents for cesarean section. A comparison of thiopentone and ketamine. *Anaesthesia* 28:37-42, 1973

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*To the Editor:*—I thank Drs. Hodgkinson and Marx for their comments, and I am particularly pleased that they support, in their third paragraph, what I regard as the message of my article, i.e., low doses of ketamine may be good for delivery, high doses are certainly not. However, I must disagree with their