

Title: LACK OF ADVERSE NEUROBEHAVIORAL EFFECTS OF LIDOCAINE

Authors: T. K. Abboud, M.D., F. Sarkis, M.D., A. Blikian, M.D., L. Varakian, M.D.

Affiliation: Division of Obstetrical Anesthesia, Women's Hospital  
Los Angeles County-University of Southern California Medical Center  
1200 N. State Street, Box 12, Los Angeles, California 90033

**Introduction:** It has been reported recently that lidocaine epidurally did not adversely affect the behavioral status of the neonate<sup>1</sup>. These findings differ from those reported by other investigators,<sup>2-3</sup> who found that the nine infants whose mothers received epidural anesthesia with lidocaine scored less well in tests designed to assess muscle strength and tone than did infants delivered without epidural anesthesia. One of the reasons might have been the smaller dose (mean±SE) used in the first report (240±17 mg) compared to the other investigators (423±40 mg). The present study was undertaken to evaluate the neurobehavioral effects of a larger dose of lidocaine.

**Methods:** 22 healthy parturients who elected to have epidural anesthesia for labor and delivery were studied. The study was approved by the Human Research Committee and informed consents were obtained. All patients had internal fetal heart rate and uterine activity monitoring. Epidural catheters were placed in the usual manner. Patients were placed supine with left uterine displacement. A test dose of 2 ml of 1.5% lidocaine without epinephrine was given and this was followed by 6 ml. Further doses were re-injected as clinically indicated until delivery of the infant. Total dose was (446±22). At the time of delivery, blood was drawn from the maternal vein and from the umbilical vein and artery for determination of lidocaine levels. Apgar scores were noted. Neonatal examination was performed at 2 and 24 hours of age using Early Neonatal Neurobehavioral Scale (ENNS). Results for ENNS were compared to a control group of 17 babies whose mothers did not receive any medications or anesthesia for labor or delivery. Data were analysed for statistical significance using Chi Square test, a P value of less than 0.05 was considered significant.

**Results:** Table (1) summarizes maternal and fetal plasma lidocaine levels. None of the variables of the ENNS differed significantly among the epidural group and the control group. All babies were vigorous at 5 minutes and there was no significant difference between the incidence of low 1 minute Apgar scores for the two groups.

Table I

Plasma lidocaine levels in ug/ml (mean±SE)	
Maternal vein	1.64±0.26
Umbilical vein	0.97±0.15
Umbilical artery	0.83±0.20
Umbilical vein/maternal vein	0.61±0.05

**Conclusion:** Results of our study indicate that lidocaine has no depressant effect on the neurobehavioral status of the newborn with the higher dose used.

**References:**

1. Abboud TK, Williams V, Miller F, et al: Comparative Fetal, Maternal, and Neonatal Responses Following Epidural Analgesia With Bupivacaine, Chloroprocaine, and Lidocaine, *Anesthesiology* (Suppl.) Vol 55, No. 3, 315;1981
2. Scanlon JW, Brown WU, Weiss JB, Alper MH: Neurobehavioral Responses of Newborn Infants After Maternal Epidural Anesthesia. *Anesthesiology* 40:1974.
3. Scanlon JW, Ostheimer GW, Lurie OA, et al: Neurobehavioral Responses and Drug Concentrations in Newborns After Maternal Epidural Anesthesia with Bupivacaine. *Anesthesiology* 45:400-405;1976.