Title: Fetal Catecholamines and Uterine Incision-to-Delivery Interval

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Introduction: Infants delivered after longer uterine incision-to-delivery (UID) intervals show a significant decrease in fetal umbilical artery pH values (1). This is probably related to a decrease in uterine perfusion which results in fetal hypoxia. The fetal catecholamine level at delivery may be related to fetal hypoxia. In the present study we have attempted to investigate the correlation between fetal catecholamine (norepinephrine and epinephrine) levels at delivery and prolonged UID intervals. The relation of these factors to neonatal outcome was analyzed.

Methods: The protocol was approved by the Human Subjects Committee and informed consent was obtained. Twenty-eight ASA I women undergoing elective cesarean delivery under spinal anesthesia were studied. Maternal venous catecholamine levels were obtained prior to induction of anesthesia and at delivery. Samples of umbilical artery and umbilical vein blood were taken at delivery and analyzed for catecholamine levels and blood gases. Linear regression analysis of the data was performed.

Results: There was a significant relationship between umbilical artery (UA) catecholamine levels and increasing UID interval (Figure 1). UA pH values were significantly lower in infants with higher UA catecholamine levels (Figure 2). There was a significant correlation between UID interval and UA pH (Figure 3).

Discussion: Although all infants show an increase in catecholamine levels at delivery, the increase seems to be markedly elevated in those infants experiencing the stress of an increased UID time. The infant's catecholamine surge at delivery may be part of normal extrauterine adaptation; however, what the optimal catecholamine level is at delivery remains unclear. The vasoconstrictive alpha-adrenergic effects of high levels of norepinephrine may be contributing to the lower pH values in these infants. This study emphasizes the importance of minimizing the UID time to prevent the occurrence of markedly elevated fetal catecholamine levels at delivery.

References:

1. Datta S, et al: Neonatal effect of prolonged anesthetic induction for cesarean section. Obstet Gynecol 58:331-336, 1981

Figure I. Catecholamine Levels vs UID

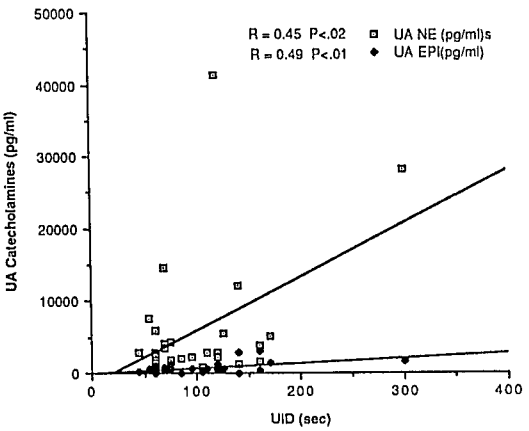

Figure II. Catecholamine Levels vs UA pH

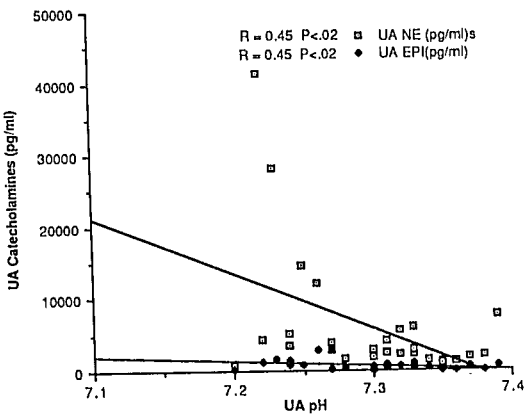

Figure III. UID vs UA pH