Title: THE EFFECT OF CIMETIDINE ON MOTHER, NEWBORN AND NEONATAL NEUROBEHAVIOR

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Introduction. Every parturient is considered to have retained gastric contents before delivery. Antacids have been considered the standard therapeutic precaution when given every 3-4 hours during labor or one hour before cesarean delivery, however, their adequacy has been questioned. (1) Cimetidine, an H2 antagonist, has demonstrated its effectiveness in decreasing gastric secretions and acid production in the surgical, nonsurgical and obstetric patient. However, cimetidine readily passes the placenta and is found in the newborn. The fetal/maternal ratio is approximately 0.5 (2) with a range of 0.1 to 0.8 depending on time from dose to delivery. Therefore, even though the efficacy of cimetidine in the parturient for vaginal and cesarean delivery has been demonstrated, its safety in the newborn has yet to be assessed by an in-depth neurobehavioral evaluation, the Brazelton Neonatal Behavioral Assessment Scale. (3)

Methods. Informed consent was obtained from the parturients who participated in this investigation which was approved by the Committee for the Protection of Human Subjects from Research Risks. The mothers were allocated in a randomized manner to either a cimetidine or an antacid treatment group. On the evening prior to elective cesarean delivery, the parturients in the cimetidine group received one 300 mg tablet of cimetidine while the antacid group received nothing. On the morning of surgery, one hour prior to induction of general anesthesia, the cimetidine group received 300 mg of cimetidine I.M. and the antacid group received 30 ml of Mylanta II. The evaluation of the efficacy of these two treatments on gastric volume and acidity was made by emptying the stomach as soon as possible after induction of anesthesia and at intervals until the patient responded to oral commands and was extubated. Maternal safety was assessed by recording all intrapartum and postpartum complications, by evaluating hematologic, hepatic and renal function together with urinalysis at 24 hours preoperatively and on postpartum days two and four. The effect on the neonate was assessed by the Apgar score at 1 and 5 minutes after birth, measurement of gastric volume and pH within ten minutes of birth and the Brazelton Neonatal Assessment Scale at 2 to 4 hours after birth and at 3 days of age. Maternal venous, umbilical venous and umbilical arterial gas tensions, pH and concentrations of cimetidine were measured.

Results. The initial and total maternal gastric volumes and initial and final maternal gastric pHs are shown in Table 1. There are significant differences between the cimetidine and antacid groups. One of 13 mothers in the cimetidine group and 5 of 13 mothers in the antacid group had a gastric pH < 2.5. No maternal or neonatal complication was attributed to either therapy. The maternal laboratory evaluations were within normal limits except that all parturients had an elevated alkaline phosphatase both pre- and postoperatively which is considered within the normal range for the pregnant woman due to the production of this enzyme by the placenta. No significant differences were found between the infants whose mothers received cimetidine and those whose mothers received antacid in comparing the induction to delivery intervals, Apgar scores at 1 and 5 minutes, umbilical vein pH, and umbilical artery pH. The neonatal gastric volumes and pHs are shown in Table II. There are significant differences in gastric pH between the cimetidine and antacid groups. Comparison of the findings on the Brazelton Neonatal Assessment Scale yielded no significant differences between individual test items and clusters of test items between the cimetidine and antacid groups.

Conclusion. Cimetidine or antacid (in this study, Mylanta II) does not totally protect the parturient from the effects of acid aspiration. However, cimetidine can effectively decrease gastric volume in the parturient undergoing elective cesarean delivery; does not produce any biochemical alterations in the mother or depress the baby as measured by the Apgar score at 1 and 5 minutes after birth. Neonates whose mothers received cimetidine had a significantly higher gastric pH at delivery. Assessment of the newborn with the Brazelton Neonatal Assessment Scale demonstrated no significant difference between the two groups in any of the items or cluster of items evaluated in the newborn at 2-4 hours or 3 days after birth.

References.

1. Tomkinson J, Turnbull A, Robson Y et al.: Report on Confidential enquires into maternal deaths in England and Wales 1973-1975. London: H.M.S.O. P. 80-81, 1979.
2. Howe JP, McGowan WAW, Moore J, McCaughey W and Dundee JW.: The placental transfer of cimetidine. **Anaesthesia 36:371-375, 1981.**
3. Brazelton TB.: Neonatal Behavioral Assessment Scale. London: Spastics International Medical Publications, 1973.

Table I

	Maternal Gastric Volume (ml)		Maternal Gastric pH	
	First[1]	Total	First	Last
Cimetidine (n=13)	8.58 ± 5.55[2] (2-20)[3]	21.11 ± 12.9 (3-50)	6.22 ± 2.21 (2.4-9.0)	6.49 ± 2.26 (2.5-9.5)
Antacid (n=11)	21.55 ± 16.87 (5-64)	46.64 ± 28.27 (14-103)	3.20 ± 1.52 (1.5-6.1)	4.17 ± 1.95 (1.5-7.6)

Table II

	Neonatal Gastric Volume (ml)	Neonatal Gastric pH
Cimetidine (n=14)	4.36 ± 3.63 (1.5-12.0)	8.01 ± 0.70 (7.0-9.4)
Antacid (n=14)	4.05 ± 3.28 (2.0-14.0)	7.34 ± 0.89 (6.0-8.6)

1 = Sample
2 = mean ± S.D.
3 = range