

TITLE: NEONATAL OUTCOME AND LIDOCAINE ABSORPTION FOLLOWING AWAKE, FIBEROPTIC INTUBATION OF THE PARTURIENT

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INTRODUCTION: Aspiration and inability to ventilate are the leading causes of maternal death due to anesthesia. Difficult intubations account for over 30% of maternal aspiration deaths. Awake fiberoptic intubation can safely be used in the parturient to reduce anesthesia-related maternal mortality.

METHODS: Over the past 25 months 442 women in our institution underwent general anesthesia for cesarean section. Institutional Review Board approval was obtained for awake fiberoptic intubation and umbilical cord sampling. All patients received 0.2 mg of glycopyrrolate intravenously, and 30 ml of sodium citrate was administered orally. Patients were retrospectively assigned to the following three groups:

Group 1 patients, in whom difficult intubation was not anticipated, were induced with Pentothal 4 mg/kg and succinylcholine, and then intubation was accomplished using a rigid laryngoscope.

Group 2 patients included unanticipated difficult intubation. After induction of anesthesia, laryngoscopy proved difficult or more than one attempt was needed to intubate the patient.

Group 3 patients consisted of anticipated difficult intubation due to: morbid obesity, short neck, or Mallampati¹ class III. The oropharynx was topicalized with 5 ml of 2% viscous lidocaine gel and 175 mg of 5% lidocaine ointment. The trachea was anesthetized with 4 ml of 4% lidocaine administered as an injection through the cricothyroid membrane. A Williams airway was placed in the oropharynx and the patient was intubated with a #7 endotracheal tube using a fiberoptic laryngoscope. Anesthesia was induced with Pentothal and succinylcholine. At the time of delivery umbilical vein blood was obtained, transferred to heparinized tubes, the plasma separated and stored at -20 C. Plasma lidocaine levels were determined by gas chromatography.

Maternal and neonatal variables were compared for the three intubation groups using 1-way ANOVA. The Kruskal-Wallis 1-way ANOVA was used for pH and maternal weight due to heterogeneous variances. The proportions with pH < 7.2 or Apgar scores < 7 were compared using categorical (χ^2) analysis. Two-tailed tests were used, with $p < 0.05$ denoting statistical significance.

RESULTS: The three intubation groups had sample sizes of 338, 23, and 81 patients respectively. These groups differed significantly for maternal weight and umbilical artery pH only (see table).

Proportions in each group with Apgar scores < 7 did not differ significantly. No statistical significance was attained for the comparison of proportion with pH < 7.2. The total dose of topical lidocaine averaged 5.1 mg/kg. Umbilical cord vein lidocaine levels from 79 neonates ranged from 0.13 to 2.38 ug/ml (mean = 0.78). The time from transtracheal injection to umbilical cord sampling was 3 to 28 minutes (mean = 14).

	GROUPS		
	1 Rigid	2 Difficult	3 Fiberoptic
N	338	23	81
Maternal Age (yrs)	29	30	29
Maternal height (in)	64	63	64
Maternal weight (lbs)	162	159	187
Gestational age (wks)	36	36	36
Birth weight (gms)	2725	2565	2887
Apgar 1 min	6	6	6
Apgar 5 min	8	8	8
Umbilical artery pH	7.2	7.2	7.3
Proportion with:			
pH < 7.2	0.24	0.19	0.12
Apgar 1 min < 7	0.43	0.39	0.36
Apgar 5 min < 7	0.16	0.13	0.12

DISCUSSION: Local anesthetic toxicity and loss of pharyngeal reflexes are well recognized hazards during awake tracheal intubation following topical anesthesia. No adverse effects were seen on neonatal outcome variables. Blood lidocaine levels were not higher than those reported following epidural lidocaine. Two parturients in group 2, after multiple failures with a rigid laryngoscope, could only be intubated with the fiberoptic. Three patients who vomited during topicalization of the airway did not develop Mendelson's syndrome.

REFERENCE:

- Mallampati SR, Galt SP, et al: A clinical sign to predict difficult tracheal intubation: A perspective study. *Canad Anaesth Soc J* 32:429-434, 1985.