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INTRANASAL MIDAZOLAM: ITS EFFECT ON MEMORY IN PEDIATRIC PATIENTS

AUTHORS: RS TWERSKY MD, J HARTUNG PhD, J MCCLAIN MD, BJ BERGER MD, C BEATON MD

AFFILIATION: DEPARTMENT OF ANESTHESIOLOGY
SUNY HEALTH SCIENCE CENTER AT BROOKLYN, 11203

INTRODUCTION: While intranasal midazolam has been described as an effective sedative in pediatric surgical patients,¹ its effect on memory has not been reported. Accordingly, we evaluated the effect of aerosolized intranasal midazolam on pediatric surgical patients' memory of preoperative events.

METHODS: Thirty-seven children, ages 4-10, ASA I and II patients undergoing elective procedures requiring general anesthesia for less than two hours were included. IRB approval and parental consent were obtained. Patients were randomly divided into Midazolam group 0.2mg/kg or Placebo group (distilled water) 0.2ml/5kg. Equal volumes were used. The study was blinded to patients, anesthesiologists administering anesthesia and nursing staff. The drug or placebo was administered intranasally using a DeVilbiss#286 atomizer. General anesthesia consisted of N₂O, O₂, Halothane and muscle relaxant as needed subsequent to mask induction. Memory testing was performed using different series of picture cards as described by Snodgrass and Vanderwaart.² The children were asked both to recall cards shown previously and then recognize the cards previously shown from among distractors not previously seen. Positive and negative responses were recorded. Interval data were analyzed by T-test, categorical variables by Chi-Square and non-parametric variable by Mann-Whitney U-test. Statistical significance was accepted at $p < 0.05$.

RESULTS: There were no significant differences between the two groups with regard to age or sex distribution. Average duration of operation, maximal Halothane concentration used or time to awakening after discontinuation of anesthetic agents was also not different. There was no laryngospasm or other complications reported in either of the two groups. Analysis of the memory data indicated that both groups performed similarly in their baseline recall and recognition. We were unable to demonstrate any significant retrograde amnesia in the Midazolam group. Postoperatively, however, the ability to recall cards shown preoperatively subsequent to Midazolam/Placebo administration was significantly decreased in the Midazolam group ($p < 0.009$) as was the ability to recognize those cards from among distractors not previously seen ($p < 0.001$).

DISCUSSION: We employed two recommended modes of sampling memory phenomenon in children - recall and recognition, and were able to demonstrate that Midazolam has a significant effect on memory compared to placebo group both in the child's ability to recall and recognize events immediately prior to the operation. We feel that these are strong desirable effects of intranasal midazolam and recommend its use as a safe and effective preoperative sedative and amnestic in pediatric patients.

REFERENCES:

1. Anesthesiology 69:971-975, 1988.
2. J Exp Psychol (Human Learning & Memory) 6:174-215, 1980.

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TITLE: Ingestion of Clear Liquids Compared with Preoperative Fasting in Pediatric Inpatients Undergoing Cardiac Surgery

AUTHORS: A. Dorsey, M.D., S.C. Nicolson, M.D., M.S. Schreiner, M.D.

AFFILIATION: Department of Anesthesiology, The Children's Hospital of Philadelphia, University of Pennsylvania School of Medicine, Philadelphia, PA 19104

Recent studies in healthy pediatric outpatients have shown that drinking clear liquids up to 2 hours prior to induction of general anesthesia is unlikely to substantially affect the volume of gastric fluid contents or the percentage of patients with a gastric fluid pH ≤ 2.5 .^{1,2,3} This study compares gastric fluid volume and pH in 2 groups of ASA physical status I-IV pediatric inpatients scheduled for elective cardiac surgery. Following approval by the Committee for Protection of Human Subjects and written parental informed consent, 32 children were randomized to 2 groups, one of whom was permitted unlimited quantities of any clear liquid until 2-3 hours before surgery (study group) and the other followed routine preoperative fasting orders (control group). Following routine oral premedication, induction of general anesthesia and tracheal intubation, a 14-18 Fr Argyle Salem Sump Catheter was inserted into the stomach (position confirmed by auscultation) and contents gently aspirated using a 60 cc syringe in the supine, right and left lateral decubitus positions. Gastric volume was noted and pH determined by Orion Research Digital Ionalyzer pH meter (Model #601 A) that was calibrated prior to each use.

	Study	Control
Number	17	15
Age (months)	43 ± 51	31 ± 51
Weight (kg)	17.1 ± 4.6	15.2 ± 4.3
Fasting Interval (h)	2.9 ± 0.1 *	9.5 ± 1.4
No Gastric Aspirate (%)	8/17 (47%)	10/15 (67%)
Gastric Fluid Volume (ml/kg)	1.09 ± 1.20	.65 ± .42
Gastric Fluid Volume ≥ 0.4 ml/kg(%)	7/9 (78)	3/5 (60)
Gastric pH	2.05 ± .33	1.48 ± .37
Gastric pH ≤ 2.5 (%)	8/9 (89)	5/5 (100)
Gastric pH ≤ 2.5 and Volume ≥ 0.4 ml/kg (%)	6/17 (35)	3/15 (20)

* $p < 0.05$

Many of these cardiac surgical inpatients, whether fasted or fed clear liquids, like healthy pediatric outpatients, had a gastric volume ≥ 0.4 ml/kg and a gastric fluid pH ≤ 2.5 . Ingestion of clear liquids until 2-3 hours prior to induction of anesthesia appears to add no additional risk for aspiration of gastric contents in children with congenital heart disease.

References:

1. Anesthesiology 71:327-330, 1989
2. Can J Anaesth 36:55-58, 1989
3. Anesthesiology 72:593-597, 1990