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 Title : GASTRIC VOLUME AND pH: COMPARISON IN ONCE- AND MULTI-ANESTHETIZED CHILDREN
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Introduction

Aspiration of acidic gastric contents is a life-threatening complication of general anesthesia. This has led many institutions to routinely administer antacids or histamine-2 receptor antagonists prior to any operative procedure.^{1,2} A recent study³ of adults showed a high degree of correlation between gastritis and emotional upset; it is generally assumed that stress increases gastric acid production. The presurgical period is a stressful situation and it was our clinical impression that the child who has had repeated surgical procedures has an unusually large gastric residual. In order to test the hypothesis that stress increases gastric acid production in children, we undertook a prospective analysis of children having their first anesthetic and children having one of many anesthetics. Evaluation of the level of preoperative anxiety was recorded. This study was approved by the Human Studies Committee as part of a study of preoperative cimetidine in pediatric patients.

Methods

Twenty-three children were randomly chosen for this study. Group I (N=12) included ASA Class I general surgery patients anesthetized for the first time. Premedication consisted of 20 to 30 mg/kg rectal methohexital; in children older than 7 years diazepam 0.1 mg/kg was administered orally.

Group II (N=11) consisted of patients in the plastic surgical reconstructive phase of recovery several years after severe burn injury. These children had had dozens of anesthetics and hospitalizations. Premedication was similar to that of Group I.

Level of preoperative anxiety was clinically assessed by one of the authors as 'very anxious,' 'anxious,' or 'comfortable.' Gastric samples were obtained by passage of a Salem sump catheter (Argyle) and gentle aspiration. Patient age and weight, estimate of preoperative anxiety, and volume of gastric aspirate were recorded. pH was measured on a Corning digital pH meter which was calibrated prior to each use. pH values were converted to hydrogen ion concentration in order to assure more accurate statistical analysis. Unpaired Student's *t* test was applied to gastric volume and H⁺ concentration. Significance of anxiety was assessed by chi square analysis.

Results

Twenty-two of 23 patients had a gastric pH of less than 2.5. There was no statistical difference in patient age or weight, level of anxiety, volume of gastric contents per kg, or pH between Groups I and II (Tables 1 and 2). Re-analyzing the data according to the level of preoperative anxiety demonstrated no statistical differences between gastric volume or pH in either the calm or anxious

patient (Table 3).

Discussion and Conclusions

Our results clearly show that there is no difference in gastric volume or pH between single-anesthetized and multi-anesthetized pediatric patients. In addition, the lack of correlation between preoperative anxiety level and gastric volume and pH further refutes our hypothesis. This study strongly suggests that no matter what the degree of apparent preoperative anxiety or surgical exposure, all pediatric patients appear to be equally at risk for aspiration of acidic gastric contents.

Table 1: Preoperative Level of Anxiety

	<u>Very Anxious</u>	<u>Anxious</u>	<u>Calm</u>
Group I	1	2	9
Group II	4	2	5

Table 2: Gastric Contents: Single vs. Multiple Anesthetics

	<u>Group I</u>	<u>Group II</u>
Volume* (cc/kg)	0.80 ± 0.70	0.90 ± 0.46
pH*	1.53 ± 1.92	1.39 ± 1.58
pH Range	1.3 - 2.2	1.1 - 2.5

* Mean ± S.D.

Table 3: Gastric Contents: Level of Anxiety

	<u>Calm</u>	<u>Anxious</u>
Volume* (cc/kg)	0.89 ± 0.6	0.85 ± 0.45
pH*	1.39 ± 1.6	1.53 ± 1.91
pH Range	1.1 - 2.2	1.2 - 2.5

* Mean ± S.D.

References

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