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Title : ORAL CIMETIDINE FOR PROPHYLAXIS AGAINST ACID-ASPIRATION IN CHILDREN

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Introduction. Cimetidine, a histamine H₂-receptor antagonist, has been demonstrated to block effectively the acid secreting parietal cells of the stomach. Its value and efficacy in decreasing the acidity of stomach contents has been very well demonstrated in adults.¹ It has also been used successfully in children for the treatment of reflux esophagitis and gastric and duodenal ulcer disease. However, its efficacy in raising the gastric pH and decreasing the volume of stomach contents prior to anesthesia has not been evaluated nor has the effective dose been determined in children.

Methods. The protocol for the present study was approved by the Subcommittee on Human Studies of the Committee on Research of our institution and written consent was obtained from the parents. Premedication consisted of Diazepam (0.1-0.2 mg/kg) given orally 2 hours before the scheduled time of surgery in children more than 7 years of age. Younger children received rectal methohexital (20-25 mg/kg) 20 min. before surgery. The anesthetic technique consisted of halothane N₂O/O₂ with endotracheal intubation. None of the children received anticholinergic drugs or antibiotics preoperatively. No relaxants were used for the facilitation of intubation. After anesthetizing the children, an appropriate size (#12, 14, 18) Salem sump tube was inserted through the mouth or the nose into the stomach. The position of the tube was confirmed by aspiration of gastric contents and by auscultation over the epigastric area while rapidly injecting air through the tube. The gastric contents were collected by using an aspirating trap and gentle suction.

The color and the volume of gastric juice was recorded. The pH was measured by a Corning digital pH meter 125 (#475-150) and standard combination semi micro electrode (#476050) which was calibrated against known reagents before every set of measurements. The pH was also evaluated by pHydroin^R paper.

The oral cimetidine was prepared in the pharmacy by soaking the tablets and suspending them in sorbitol solution.

Thirty-five children, 1 to 12 years of age (mean \pm S.E. 5 \pm 1 yr) were studied. The mean weight of the children was 18 \pm 2 kg. The children were divided into three groups. The first group acted as controls (n=14) and did not receive any preoperative cimetidine. The second group (n=9) received 5 mg p.o. cimetidine approximately 2 hours before the beginning of surgery. The third group (n=12) received 10 mg p.o. 2 hours before surgery. The three groups of children were comparable in age, weight and the level of preoperative anxiousness as estimated clinically.

Results. The results of the gastric pH as measured by the pH meter, the derived H⁺ concentration, and the volume of gastric juice are summarized in Table I. The nondifferentiated Student's t-test was used for statistical analysis.

Discussion. Preoperative cimetidine at a dose of 5 and 10 mg/kg markedly raised the pH of stomach con-

tents as well as decreased the volume of gastric aspirate. At a dose of 5 mg/kg, two children had a preoperative pH of 2.4 which made them potentially vulnerable for aspiration pneumonitis. However, at a dose of 10 mg/kg, all the children were on the "safe" side. The results of the present study show that cimetidine at a 10 mg/kg dose is more effective in decreasing the acidity of stomach contents than glycopyrrolate (10 μ g/kg) and scopolamine (20 μ g/kg) as has been demonstrated in a previous study.²

References.

1. Maliniak K and Vakil AH: Preanesthetic cimetidine and gastric pH. *Anesth. Analg.* 58:309-313, 1979
2. Salem MR, Wong, AY, Maxim, et al.: Premedication drugs and gastric juice pH and volume in pediatric patients. *Anesthesiology* 44:216-219, 1976

| Table I | | pH | H ⁺ Conc m mol/l | Volume ml |
|------------|--------------|------------------|--------------------------------|----------------|
| Control | M \pm S.E. | 1.62 \pm 0.07 | 29.1 \pm 5.1 | 15.8 \pm 3.7 |
| (14) | Range | 1.1-2.19 | 6.4-79 | 2-45 |
| Cimetidine | M \pm S.E. | 4.73 \pm 0.66* | 1.24 \pm 0.64* | 3.3 \pm 1.5* |
| 5 mg/kg | Range | 2.4-7.46 | 0.0001-3.9 | 0.4-14 |
| (9) | | | | |
| Cimetidine | M \pm S.E. | 4.98 \pm 0.47* | 0.0579 \pm 0.371* | 1.7 \pm 0.7* |
| 10 mg/kg | Range | 3.4-7.78 | 0.000016-0.39 | 0.2-9 |
| (12) | | | | |

* Indicates statistical significance (P < 0.001) between the control groups and the cimetidine groups.