Clinical Workshop

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Color as an Index of Gastric-content Acidity

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Mendelson's syndrome[1] develops after inhalation of gastric secretions of *p*H 2.4 or less.[2] The presence of bile in the stomach is indicative of reflux of duodenal content (*p*H approximately 8) into the stomach. When vomiting or regurgitation of bile-colored material occurs, can it be assumed that neutralization of gastric content has occurred, elevating its *p*H above the dangerous level? This study was designed to test this assumption.

Samples of vomitus were obtained after spontaneous emesis from 50 elective surgical patients during emergence from anesthesia maintained with a number of different anesthetics. The material was collected in a clean emesis basin, its *p*H was determined with Hydrion *p*H paper to within 0.5 *p*H units, and its color noted. It was then transferred into glass pipettes, sealed with Critoseal and stored for color comparison.

Nine of the 50 samples had a distinct bile-tinged (golden brown) color; 41 were colorless. While the *p*H values of the colorless samples ranged from 1.5 to 7.0, all of the bile-tinged specimens had *p*H values of 5.0 or more (table 1).

The findings confirm earlier reports[3] that *p*H values of gastric contents in elective surgical patients may range from 1.5 to 8. In our series 32 per cent of the patients had gastric contents with *p*H values of 2.5 or less.

While bile coloration of gastric content gives good assurance that its *p*H is above the danger level of 2.5, the *p*H of colorless gastric content is unpredictable. In cases of suspected aspiration of colorless liquid material the determination of its *p*H is important, because immediate treatment and close observation are indicated when the *p*H is below 2.5.

The measurement may be done rapidly and inexpensively on a small sample from the mouth, face mask, suction tip, or pillow with the aid of *p*H paper (*e.g.*, Hydrion *p*H paper, range 1 to 5.5). It is suggested that every anesthetist have *p*H paper available for such tests.

REFERENCES

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2. Teabeaut JR: Aspiration of gastric contents: Experimental study. Amer J Path 28:51, 1952
3. Taylor G, Pryse-Davies J: The prophylactic use of antacids in the prevention of the acid-pulmonary-aspiration syndrome (Mendelson's syndrome). Lancet 1:288, 1966

TABLE 1. Correlation between Color and *p*H of Gastric Content in Elective Surgical Patients

	"Dangerous" *p*H			"Safe" *p*H									
	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0
Colorless	4	5	7	4	5	6	0	2	3	0	2	3	0	0
Bile-colored	0	0	0	0	0	0	0	1	0	2	1	4	0	1

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