New York Meeting.

New York Academy of Medicine, May 21, 1930.

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Studies in Gastric Analysis in Children.

IRVING S. WRIGHT, ADOLPH G. DE SANCTIS AND JOHN A. KILLIAN.

From the Departments of Biochemistry and of Pediatrics, New York Post-Graduate Medical School and Hospital.

As a preliminary to a study of gastric function in pathological conditions in children, this investigation was undertaken to establish normal figures in a control group. Studies were made on a total of 50 children, ages ranging from 3/12 to 8 6/12 years, in the terminal stages of convalescence prior to discharge from the hospital. None had been ill from any condition associated with the gastro-intestinal tract. The diets were unrestricted. The display of apparently normal appetites excluded anorexia. Gastric contents were aspirated through a small rubber tube introduced orally 1 hour after ingestion of 40 gm. of white bread and 200 cc. of water. In a few instances this meal was modified. Fifteen cases received 6 mg. of phenol red added to a meal. The acidity of gastric contents was determined by Topfer's method. The volume of the gastric contents varied from a minimum of 10 ml. to a maximum of 356 ml. For adults a range 50 to 120 ml. is accepted as average normal. Volumes in 23 cases fell within this zone, 20 were above, and 2 below. When volume was plotted against age of the children, there was no apparent relation of volume of gastric contents to age.

In vitro the addition of 40 gm. of bread without crusts to 200 ml. of 0.1 N hydrochloric acid increased the volume of the fluid to 230 ml., i. e., the increase in volume amounted to approximately 75% of the weight of the added bread. When incubated at 37°C for 72 hours, the volume of the mixture remained 230 ml.

The chymified sediments in the gastric extractions were permitted

to settle to minimum volume at room temperature and the volumes of sediment were noted. In the 36 cases the sediment has a mean volume of 48.2% of the gastric contents, between extremes of 12.5 and 88.5%.

Results for acidity of gastric contents are expressed in terms of milli-equivalents of chlorine per 100 ml. We have accepted as a normal range of total acidity of gastric contents of adults between 6.0-8.0, of the free hydrochloric acid 3.0-4.0, and combined HCl 2.5-3.0. Seventeen per cent of the children gave figures for total acidity exceeding the upper normal level for adults, 23% fell within this zone, and the remainder of the figures were below the lower normal level. The figures for total acidity ranged from 2.8 to 11.6. Of the figures for free HCl, 9% were above the upper normal level for adults, 69% were below the lower normal level for adults, in 19% an achlorhydria was found, and 2% were within the normal adult zone. Histamine was not used in these cases. Nine per cent of the figures for combined HCl were within the range accepted as normal for adults, 30% of the figures exceeded the upper normal level for adults, and 54% fell below the lower normal level. In 6% of the cases the volume of gastric content was insufficient for determination of combined hydrochloric acid.

The difference between the sum of the free hydrochloric acid and combined hydrochloric acid, and the total acidity was significantly greater than this difference noted in adults. (Maximum = 1.0 milli-equivalent of Cl per 100 ml.). The acidity not due to free HCl nor combined HCl averaged 2.0 milli-equivalents of chlorine per 100 ml. with a. d. = ± 0.92 and A. D. = ± 0.18.

There was evident no consistent relationship of total acidity nor of any of its components to the age of the children between 3/12 and 8 years.

A trace of bile was found in the gastric contents in only one of 8 cases examined.

Normal standards for peptic activity (with Rose-Givens technic) of gastric contents of adults are 10-20. Of the children 38% gave peptic activity within this range, 4% exceeded the upper normal adult level and 57% were below the lower normal adult figure. Twenty-three per cent presented figures below 5, and in 4% no peptic activity was found. It is not possible to demonstrate a definite relation of peptic activity to the concentration of free hydrochloric acid.

Six milligrams of phenol red were added to the meal in 15 cases and the concentration of phenol red in gastric contents determined

after one hour. Results for phenol red are reported in terms of the fraction of the dye remaining in the stomach after one hour. In all cases except one the volume of the fluid and bread in the meal was 230 ml. In one instance 150 ml. of fluid were given. The volume of gastric contents withdrawn at the end of an hour averaged 54.8% of the meal, between extremes of 38 and 97%. The volume of sediment was noted after standing at room temperature until the maximum sedimentation has been obtained. In 13 cases the average normal of sediment was 61% of the volume of gastric contents, between extremes of 36 and 71%. The average phenol red concentration of gastric contents was 23.13% of the amount ingested (a. d. $= \pm 5.7$ A.D. $= \pm 1.6\%$).

No effort is made at this time to interpret these results, nor to review the literature on this subject covering this age group.

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On the Dialysability of Proteins.

ARTHUR F. COCA.

From the Department of Serology, New York Hospital, and the Department of Bacteriology, Cornell University Medical College.

In several of his recent studies upon atopic hypersensitiveness (Idiosynkrasie), W. Jadassohn[1, 2] has reported the fact that the excitants of the hypersitiveness (to celery, guinea pig serum and egg white) are dialysable. In the dialysate from egg white, the presence of protein could not be demonstrated with any of the chemical tests for protein. From these observations, this author draws the conclusion that the atopens in the materials mentioned are not proteins and not antigens. He considers them therefore as belonging in the group of the haptens (Landsteiner).

Jadassohn did not directly test any of the dialysates for the presence of antigen, and he seems therefore to base his conclusion that the dialysable atopens are not antigenic, upon the universally accepted assumption that the antigens are colloids and therefore not dialysable.

Jadassohn does not state in any of his reports, what kind of membrane he used in his experiments.

[1] Jadassohn, W., *Schweizerischen Med. Woch.*, 1926, No. 27.

[2] Jadassohn, W., *u. Zaruski. Marg., Arch. f. Derm. u. Syph.*, 1926, cli, 93.