

TABLE I.

Group	No. rats	Vitamin D, units/kg	Kombucha, cc/kg	Wt change in g
1	2	0	0	+68, +89
2	2	0	10	+45, +65
3	4	100,000	0	-47, -44, -85, -127
4	4	100,000	2	-70, -75, -98, -150
5	4	100,000	5	-85, -90, -90*, -90*
6	5	100,000	10	-72*, -70, -95, -120, -122

* Died during last week and were eaten by cage mates. Weights recorded at end of 3rd week.

as may be judged from this type of experiment, the claim of antagonism of Kombucha to the toxic action of vitamin D was not supported.

15009 P

Supra-Diaphragmatic Section of Vagus Nerves and Gastric Secretion in Patients with Peptic Ulcer.

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The studies on gastric secretion to be reported in this paper were performed on 19 patients with duodenal ulcers both before and after division of all vagus fibers to the stomach. The nerves were divided just above the diaphragm by a method previously described.¹ Observations have been made on the continuous night secretion of gastric juice, and the secretory response to histamine, caffeine, insulin, and sham feeding.

a. *Continuous Night Secretion.* There are surprisingly few data on the secretion of the empty stomach of ulcer patients in the absence of any known gastric stimulant. The studies embodied in this report were made as follows: At 9:00 p.m. the stomach was emptied and lavaged with an Ewald tube. When the returns were clear, a Levine tube was introduced through the nose into the stomach and continuous suction maintained until 9:00 a.m. with the Wangenstein apparatus. In 9 patients with carcinoma of the

stomach an average of 261 cc of secretion was obtained with a free acidity between 0 and 21 clinical units. In 5 patients with carcinoma of the colon an average of 238 cc was obtained with a free acidity between 0 and 18 clinical units. In 6 patients with gall stones an average of 385 cc of secretion was obtained with a free acidity of 0 to 13 clinical units. In contrast to these findings in 19 patients with duodenal ulcer the night secretion averaged 820 cc with a free acidity between 24 and 82 clinical units. After recovery from the operation for division of the vagus nerves, the ulcer patients secreted an average of 415 cc with a free acidity between 0 and 61 clinical units. These observations indicate an abnormally large secretion of gastric juice commonly occurs in the empty stomach of ulcer patients in the absence of any of the usual types of secretory stimuli and that this excessive secretion is neurogenic in origin.

b. *Gastric Secretion in Response to Histamine.* In 19 patients with duodenal ulcers the gastric secretory response to histamine was determined by the usual technic. In each case an abundant flow of gastric juice with high free acidity was obtained and there was

¹ Dragstedt, Lester R., and Owens, Frederick M., Jr., *Proc. Soc. Exp. Biol. and Med.*, 1943, **53**, 152; Dragstedt, Lester R., Palmer, Walter L., Schafer, Paul W., and Hodges, Paul C., *Gastroenterology*, 1944, **3**, 450.

no significant difference in either volume or acidity after vagus section.

c. *Gastric Secretion in Response to Caffeine.* Roth, Ivy, and Atkinson² have recently reported that patients with peptic ulcer secrete more gastric juice in response to caffeine than do normal individuals. Using the same method we have studied the effect of caffeine on 17 patients with peptic ulcer. One patient failed to respond either before or after operation. A second patient showed a moderate increase in secretion before the vagus section but not afterward. The other 15 patients responded with an increase in volume and free acidity both before and after operation. The stimulation was as marked after operation as before. In general the effect was less than secured by histamine.

d. *Gastric Secretion in Response to Insulin.* The injection of insulin into experimental animals in doses sufficient to produce hypoglycemia causes a secretion of gastric juice. This stimulating effect seems to be due to the hypoglycemia rather than the insulin since it is abolished by the injection of glucose and it is not seen in the diabetic unless hypoglycemia occurs. Twenty units of crystalline insulin were given to 17 patients with peptic ulcer and subsequently fractional gastric analyses were made on samples of secretion

removed at 10-minute intervals. Two of the patients did not respond but in the remaining 15 an increase in the volume and free acidity of the gastric juice was obtained. This effect was often delayed as long as an hour and was accompanied by a low blood sugar and hypoglycemic symptoms. The stimulation was not as marked as with histamine but approximated that obtained with caffeine. It was completely abolished after the vagus section except in one patient where a slight but definite stimulation was secured. The findings confirm the prediction of Hollander that the abolition of response to insulin may serve as a physiological test for the completeness of the vagotomy in ulcer patients.

e. *Gastric Secretion in Response to the Sham Meal.* Sham meals were given to 10 ulcer patients before and after vagus section. The tests were performed by having the patients chew various foods without swallowing. Ten-minute fractional samples of gastric juice were withdrawn for a 60-minute period. Only 3 of the 10 patients displayed a definite increase in volume and free acidity of the gastric juice in response to the sham meal before operation. None responded after operation. It is likely that this test would prove more satisfactory with further experience and the use of more palatable food for the sham meal.

² Roth, J. A., Ivy, A. C., and Atkinson, A. J., *J. A. M. A.*, 1944, **126**, 814.

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Supra-Diaphragmatic Section of the Vagus Nerves and Gastric Motility in Patients with Peptic Ulcer.

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During the past two and one-half years bilateral section of the vagus nerves to the stomach has been performed on 38 patients with duodenal ulcer, gastric ulcer, or gastrojejunal ulcer. The technic of this operation and some of the results have been reported elsewhere.¹ In this paper we wish to make a

preliminary report of some observations that have been made on the motility of the stomach

¹ Dragstedt, Lester R., and Owens, Frederick M., Jr., *Proc. Soc. Exp. Biol. and Med.*, 1943, **53**, 152; Dragstedt, Lester R., Palmer, Walter L., Schafer, Paul W., and Hodges, Paul C., *Gastroenterology*, 1944, **3**, 450.