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Transitory Character of the Achlorhydria During Fever Demonstrated by the Histamine Test.

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The transitory achlorhydrias might present a clinical material suitable for the study of the unknown mechanism by which a strong mineral acid is being constantly produced by certain cells of the gastric mucosa. Whether this type of achylia will prove more useful than animal experiments depends upon several factors, one being the pathogenesis of this transient inhibition. Faber[1] has recently restated his well known view upon the achylias, including the transitory forms, as expressions of an anatomically manifested gastritis. Faber mentions the occurrence of achylia in intestinal diseases, particularly dysentery, typhoid, and paratyphoid fever, and points out the slow and gradual recovery from the achylia as the common course of events. Observations during induced fever in dogs and during experimentally produced hyperthermia led Carlson[2] and his co-workers to reckon with functional inhibition of cell activity rather than with histological changes of more stable nature.

By substituting the histamine test for the test meal the gastric secretion can be studied during severe fevers without inconvenience to the patients. In this series the histamine dose has been 0.5 mg. ergamine (Burroughs Welcome). The test has been carried out on a fasting stomach. The stomach was not washed previous to the subcutaneous injection, but the fasting contents had been withdrawn. With this small dose of histamine the highest free acidity was obtained in the juice secreted during the second 10-minute period after the injection. The sample analyzed represents the secretion during the first 20-minute period after the injection. Thus the values are not strictly maximum values. Günzburg's test has been carried out on all samples giving a free acidity below 20. We consider this essential.

Under the conditions described achlorhydria has been found in 23 patients with fever varying between 38.4° C. and 40.4° C. Of the 23 patients 9 had typhoid fever, 2 paratyphoid infection, 4 tuberculosis, 1 bronchopneumonia, 1 lung abscess and 1 cirrhosis of the liver. The causative relationship between the fever and the achlor-

[1] Faber, Knud, *Lectures on Internal Medicine*, New York, Hoeber,1927.

[2] Meyer, J., Cohen, S. J., and Carlson, A. J., *Arch. Int. Med.*, 1918, xxi, 354.

hydria is supported in different ways. First, achlorhydria as an incidental finding is very rare in Peking, as demonstrated by the fact that only one such case of achlorhydria (28 year old patient with urticaria) has been found among 284 consecutive histamine tests carried out in our Out-patient Department and wards during the last four months. Second, when contrasting our fever cases against a series of cases of intestinal disease without fever free hydrochloric acid was regularly found in the latter. Thus 6 cases of acute bacillary dysentery all showed free HCl varying between 20 and 77 cc. 0.1 N acid per 100 cc. Likewise 8 cases of chronic dysentery (1 amoebic and 7 bacillary) all showed free acid, varying between 14 and 74. One of these cases had a duration of 17 months. Third, 10 of our cases with achylia during fever, were reexamined after the fever had subsided (Table I). Eight out of these 10 cases

TABLE I.

Showing time and extent of the return of the hydrochloric acid secretion after acute fever disease. Acidity expressed in cc. 0.1 N NaOH per 100 cc. Indicators: Dimethylaminoazobenzene and phenolphthalein. Sample withdrawn 20 minutes after histamine injection (0.5 mg. Ergamine, Burroughs Welcome).

Age	Diagnosis	Gastric analysis during fever					Gastric analysis during convalescence			
		Day of disease	Temp. C.	Vol. cc.	Free HCl	Total acidity	Day of norm. temp.	Vol. cc.	Free HCl	Total acidity
18	Typhoid	23	39.0		0	32	19	30	72	77
30	Resp. Inf.				0	3		14	22	40
24	Typhoid	13	38.9	9	8*	45	9	34	78	90
28	Typhoid	11	38.9	25	1*	9	10	83	62	71
24	Paratyphoid	10	38.8	35	11*	18	7	53	48	56
19	Typhoid	21	39.5	27	4*	20	5	58	106	111
17	Typhoid	15	39.0	12	0	14	12	23	30	38
22	Typhus	16	39.6	16	0	10	4	25	52	59
23	Typhoid	26	38.9	14	0	16	8	11	10*	18
34	Typhoid	60	39.0	15	0	7	27	7	6*	28

*Günzburg negative.

showed a return of free hydrochloric acid in a concentration between 22 and 106 cc. 0.1 N acid per 100 cc. The second test, showing the return of free acid, was carried out a short time after the temperature had become normal, the number of days of normal temperature varying between 4 and 19. In 2 cases of typhoid fever free HCl had not returned on the 8th and 25th day respectively of normal temperature. In all cases where the free acid recurred there was an increased amount of secretion after the fever, as compared with the fever period.