Presence of Secretin in Cystic Fibrosis of the Pancreas. (17898)

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The existence of unusually viscid duodenal secretions in cystic fibrosis of the pancreas has long been recognized. The explanation has been uncertain but among others, a hyperparasympathetic state and a defect of mucin liquefaction have been prominently considered. Baggenstoss, Power and Grindlay have recently reported the absence of secretin in the small bowel of a fibrocystic case(1) and hypothesized that a congenital absence or deficiency of this hormone might be the etiological factor(2). Interest in this possibility has been keen since it suggested a therapeutic approach to this baffling disease. In the present study, the distribution of secretin was determined in a variety of control infants and children as well as in 4 with fibrocystic disease of the pancreas. In 2 of the latter (SB and PO; Table II), the clinical diagnosis had been verified antemortem by duodenal drainage, whereas this was not performed in the others, due to the debilitated states of the infants. However, when first seen by the present authors, the cough, pneumonitis and steatorrhea were typical. Stool trypsin was absent in GC and was not tested in CW because of pancreatin administration. The autopsy diagnosis was definite in all 4.

The first 3 feet of jejunum (together with some duodenum in a few cases) were removed at autopsy, everted and extracted with 100-120 ml of 0.4% hydrochloric acid. Saturation of the acid extract with sodium chloride led to the separation of the 'A-precipitate' which was then submitted to trichloroacetic acid treatment according to the procedure of Greengard and Ivy(3). The resulting SI concentrates were assayed for secretin in anesthetized dogs by the method of Gershbein, Wang and Ivy(4). The log dose-response curves for a number of the dogs, served as invaluable tools for potency evaluation. Baggenstoss, Power and Grindlay also prepared SI concentrates from the small bowel of controls and the one fibrocystic case. Their method of assay consisted of injecting the sample into dogs with permanent pancreatic fistulas, and noting whether a secretory response ensued.

Tables I and II show the distribution of secretin† in the small bowel of 11 controls and 4 fibrocystic disease cases, respectively. For 4 of the controls only one definite assay result could be obtained due to the poor yields of SI or the low sensitivity of some of the assay animals. The comparison of responses of the standard concentrate with the SI from GC (Table II) in an unanesthetized dog with a permanent pancreatic fistula gave a value comparable to the one obtained with the anesthetized acute animal. Secretin occurred in all of the concentrates. Furthermore, the fibrocystic secretin values appear to lie within the normal range.

Conclusions. Secretin was found to occur in the upper bowel of 4 infants and children with cystic fibrosis of the pancreas in amounts comparable to those of controls. The hypothesis that a congenital absence or deficiency of secretin may be an etiological factor of this disease appears to be untenable.

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† Cholecystokinin also occurred in the normal as well as in the fibrocystic SI concentrates. Some assay results (units of cholecystokinin per mg of extract; reference 4) are as follows: WS, 2.9; 3.0; ST, 2.9; 2.9; PO (Table II), 0.83; 0.83.

TABLE I.
Occurrence of Secretin in Small Bowel of Controls.

Case	Age	Sex	Pathology	Time interval between death & gut removal, hr	SI yield, mg	Secretin assay (units/mg)	Total secretin unitage
BU*	12 hr	M	Congenital atelectasis	10	22.0	.28; .23	5.7
PO*	24 mo.	F	Encephalitis	19	55.3	<0.2; .08	4.4
WA	2 wk	M	Acute diarrhea	4	13.8	.28	3.9
WI*	9 mo.	M	Acute bronchiolitis	6	41.1	.30; .33	13.
TE	23 mo.	M	Pneumonia; congenital heart disease; Mongolism	28	77.9	.25; .25; .26	19.
EV	7 mo.	M	Amyotonia congenita	29	27.6	.32	8.8
PR*	16 mo.	F	Meningococcus meningitis	11	54.2	.34; .34; .38	19.
WS*	6 yr	F	Leukemia	5	176.	.67; .71; .72	123.
RO	7 yr	M	Acute glomerulonephritis	8	30.3	1.0; 1.4	36.
ST	6 mo.	M	Leukemia	6	82.1	.71; .77; .77	62.
SH	1 mo.	F	Acute diarrhea	20	18.9	.09	1.7

* Negroid.

TABLE II.
Secretin Content of Small Bowel in Cystic Fibrosis of the Pancreas.

Case	Age	Sex	Time interval between death & gut removal, hr	SI yield, mg	Units secretin/mg*	Total secretin unitage
GC	5 mo.	M	3	87.6	.26;* .25	22
CW	5 yr	F	5	188	1.0; 1.05	188
PO	5 yr	F	5	245	.33; .37; .37	88
SB	6 yr	F	11†	253	.40; .40	101

* Assay result obtained with an unanesthetized dog with a permanent pancreatic fistula.
† This bowel specimen, which also contained almost all of the duodenum in addition to three feet of jejunum, was packed in dry ice for a period of 10 hours after autopsy.

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Effect of Adrenalectomy on Radiation Induced Mortality of the Mouse.* (17899)

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The relationship of the adrenal-pituitary system to radiation illness has been studied intensely. LeBlond and Segal(1) demonstrated that local destructive irradiation of part of the body resulted in generalized thymo-lymphatic atrophy, which was prevented by adrenalectomy. However, adrenalectomy does not influence the atrophy of lymphoid tissue following direct irradiation. Patt, *et al.*(2,3,4), in a series of studies, dem-

* The opinions or conclusions contained in this report are those of the authors. They are not to be construed as necessarily reflecting the views or the endorsement of the Navy Department.

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