

SECRETORY FUNCTION OF THE STOMACH IN PARATHYROIDECTOMIZED RATS

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The information in the literature on the effect of hypoparathyroidism on gastric secretion is scanty and contradictory. Besides the view that hypoparathyroidism is accompanied by stimulation of gastric secretory activity [1, 8, 9] the opposite view is held, according to which hypoparathyroidism is accompanied by inhibition of gastric secretion [2, 5, 7]. S. I. Lebedinskaya has found experimentally in a partially parathyroidectomized dog that hypoparathyroidism is accompanied by inhibition of gastric secretion, subsequently changing to stimulation of gastric secretory activity, especially of its chemical phase. The object of the present investigation was to study the degree and character of disturbances of the gastric secretory activity in parathyroidectomized rats.

EXPERIMENTAL METHOD

The investigation was conducted on noninbred male albino rats with an initial weight of 220 g. On 8 experimental animals the parathyroid glands were removed bilaterally and a gastric fistula formed [3]. The controls were rats on which a gastric fistula only was formed. The secretory activity of the stomach began to be investigated one week after the operation. The maximal period of observation on the experimental animals was six months, and on the control animals 8 months.

In the normal and parathyroidectomized rats the level of secretion of gastric juice, the free hydrochloric acid, the total acidity, the proteolytic activity of the gastric juice, and the effect of histamine on gastric secretion were studied. The gastric secretion was investigated after the animals has fasted for 18 h. For collection of the gastric juice the rats were placed in a specially constructed immobilization chamber with three moveable walls.

The gastric secretion was investigated in three or four rats simultaneously. The gastric juice was collected into graduated tubes after the stomach had first been washed out with warm water. The volume of gastric juice was measured every 30 min or after 1-2 h. The proteolytic activity of the juice was determined by Hunt's method as modified by B. I. Sabsai [6]. During collection of the juice for estimation of the proteolytic activity, the graduated tube was placed in a bath of ice.

TABLE 1. Secretory Function of the Stomach of Normal and Parathyroidectomized Rats

Time (in min)	Normal animals			Parathyroidectomized animals		
	volume of gastric juice	conc. of HCl	total acidity	volume of gastric juice	conc. of HCl	total acidity
30	1,2 (66)	29 (24)	51 (25)	1,3 (53)	39 (15)	66 (15)
60	1,1 (66)	55 (26)	87 (26)	1,2 (52)	70 (15)	100 (15)
90	0,9 (42)	52 (14)	74 (15)	1,1 (18)	81 (13)	105 (13)
120	0,8 (41)	56 (14)	87 (14)	0,9 (20)	81 (13)	105 (13)
150	0,7 (34)	36 (4)	71 (4)	0,6 (8)	72 (6)	115 (6)
180	0,9 (30)	49 (4)	77 (4)	0,6 (7)	55 (6)	91 (6)

Note. Here and in Table 2 the number of investigations is shown in parentheses.

* The chamber was constructed in cooperation with the staff of the experimental workshop (Head A. I. Bartyzel').

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TABLE 2. Effect of Histamine on Gastric Secretion of Normal and Parathyroidectomized Rats (Mean Data)

Index	Before injection of histamine		After subcutaneous injection of 0.05 mg histamine	
	control animals	parathyroidectomized animals	control animals	parathyroidectomized animals
Volume of gastric juice (in 30 min)	0.98 (279)	1.1 (158)	0.87 (34)	1.1 (55)
Concentration of free HCl	46 (86)	66 (68)	85 (33)	88 (14)
Total acidity	73 (88)	95 (68)	117 (33)	120 (14)
Proteolytic activity of gastric juice	25 (18)	22 (8)	20 (8)	9.4 (8)

EXPERIMENTAL RESULTS

The results obtained are given in Tables 1 and 2.

As Table 1 shows, parathyroidectomy was accompanied by a considerable increase in the concentration of free hydrochloric acid and the total acidity, but had no effect on the volume of juice secreted per unit time in these animals. It is interesting that the subcutaneous injection of 0.5 mg histamine likewise had no effect on the volume of gastric juice secreted both by the normal and by the parathyroidectomized rats (Table 2).

It follows from Table 2 that histamine considerably increased the concentration of free hydrochloric acid and the total acidity of the gastric juice in the normal and parathyroidectomized rats. The proteolytic activity of the gastric juice was lowered by injection of histamine.

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All abbreviations of periodicals in the above bibliography are letter-by-letter transliterations of the abbreviations as given in the original Russian journal. *Some or all of this periodical literature may well be available in English translation.* A complete list of the cover-to-cover English translations appears at the back of the first issue of this year.
