Application of PLNP with oxygen for the treatment of the infected pregnant rats on the 4th and 7th days led to the appearance of a phase of fast waves, alternating with a phase of slow waves.

The duration of the phases, the frequency and period of the fast and slow waves, and the strength of the uterine contractions reached their levels in the healthy albino rats (Fig. 2).

Intrauterine streptococcal infection of the fetus during pregnancy thus leads to disturbances mainly of the strength of muscular contractions accompanying fast waves and also to changes in the duration of the phases of the fast and slow waves. The greatest changes are observed in the case of infection during placentation.

Application of PLNP under normal conditions increases the frequency and strength of the muscular contractions accompanying the fast waves. This probably accelerates labor when abdominal compression is used in obstetrics. Treatment of pregnant albino rats infected in the period of implantation and placentation by means of PLNP combined with oxygen restores the altered parameters of uterine bioelectrical activity.

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EFFECT OF ADRENALECTOMY ON GASTRIC SECRETION INDUCED BY FOOD OR HISTAMINE IN DOGS

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The effect of total adrenalectomy on gastric function was studied in chronic experiments on dogs with Pavlov gastric pouches and Basov fistulas. The decrease in the level of maximal secretion of juice was connected with changes in the hemodynamics of the stomach. A tendency for the level of acid formation in the stomach to decrease was observed. Significant differences were found in the character of secretion of proteolytic enzymes in response to different types of activators of secretion, indicating the specific nature of activation of the gastric secretory system in the case of each stimulus, as well as differences in the effect of adrenalectomy on secretion induced by them.

KEY WORDS: *adrenalectomy, gastric secretion, histamine, food loading.*

In clinical and experimental investigations serious lesions of the gastrointestinal tract arise during disturbances of adrenal function [2, 3, 6, 9].

The object of this investigation was to study the effect of acute adrenal failure on the basic indices of gastric secretion. By the use of histamine and food loading tests it is possible to determine whether the changes observed are organic or merely functional.

EXPERIMENTAL METHODS

Chronic experiments were carried out on four dogs with Pavlov pouches (gastric secretion was induced by meat in a dose of 10 g/kg body weight) and on two dogs with Basov fistulas (secretion induced by histamine in a dose of 1 ml of the 0.1% solution, subcutaneously). Total adrenalectomy was performed in one stage. For the first 3 or 4 days after the operation

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TABLE 1. Latent Period of Secretion and pH of Gastric Juice in Response to Meat and Histamine in Control Experiments and after Adrenalectomy (M±m)

	Meat		Histamine	
	control	experiment	control	experiment
Latent period, min	11,27±0,20	19,33±1,49 $P<0,001$	7,77±0,30	9,40±0,40 $P<0,01$
pH	1,27±0,05	1,34±0,06	1,12±0,03	1,09±0,08

replacement hormone therapy was given to the animals: 25 mg hydrocortisone and 0.2 ml of a 0.5% oily solution of deoxycorticosterone acetate intramuscularly each day. The chronic experiments began 7-8 days after the operation, when adrenal failure was complete. Experiments of the control series were carried out on the same animals but before adrenalectomy.

The latent period of secretion of gastic juice to the two stimuli, the pH, and the volume of juice, expressed per kg body weight for each hour over a period of 5 h (in response to meat) and for each 15 min in the course of 75 min (in response to histamine) were determined. The proteolytic activity of the enzyme was estimated in each sample of juice [8].

EXPERIMENTAL RESULTS AND DISCUSSION

No significant differences in the character of the changes in secretion after adrenalectomy were observed depending on the method of stimulation of gastric secretion. The latent period of secretion of juice after adrenalectomy was increased significantly in response to both histamine and food loading (Table 1). Consequently, the functional excitability of the gastric secretory apparatus was depressed and the depression was more marked in the case of food loading.

With both methods of stimulation the level of secretion of juice was reduced in tests in which the quantity of juice in the background experiments was maximal (Table 2). The secretion of gastric juice plays an important role in the water metabolism of the body and is intimately dependent on the fluid level in the blood and tissues. In the healthy organism functional activity of the gastric glands is accompanied by an increase in the blood flow in the mucous membrane [4, 5, 7]. This may be due to selective dilation of the precapillary vessels,

TABLE 2. Secretion and Proteolytic Activity of Gastric Juice in Response to Meat and Histamine Loading in Control Experiments and after Adrenalectomy

Sample No.		Secretion, ml juice/kg body weight		Proteolytic activity, mg tyrosine/ml	
		control	experiment	control	experiment
		Meat			
1		0,87±0,10	0,49±0,06	2,080±0,100	2,747±0,164
	P		<0,01		<0,001
2		0,38±0,04	0,28±0,04	2,175±0,130	2,678±0,150
	P				<0,05
3		0,31±0,03	0,22±0,03	2,428±0,155	2,576±0,228
	P		<0,05		
4		0,30±0,03	0,21±0,02	2,445±0,163	2,759±0,14
	P		<0,05		
5		0,27±0,03	0,23±0,02	2,476±0,167	2,669±0,140
		Histamine			
1		0,99±0,17	1,07±0,17	2,706±0,207	0,201±0,032
	P				<0,001
2		0,25±0,29	1,49±0,16	1,825±0,220	0,264±0,072
	P		<0,001		<0,001
3		1,67±0,17	0,97±0,18	1,485±0,210	0,260±0,118
	P		<0,05		<0,001
4		0,96±0,15	0,82±0,15	1,638±0,295	0,395±0,178
	P				<0,001
5		0,51±0,10	0,62±0,16	2,027±0,335	0,422±0,210
	P				<0,001

leading to an increase in the capillary filtration pressure and permeability. The level of hydrostatic pressure has a decisive role in the transfer of water into the lumen of the stomach. This parameter depends on the state of the central hemodynamics and of neuroendocrine regulation, which redistributes the volume of blood reaching the organs and tissues. In adrenalectomized animals substantial changes in water and salt balance are observed and the excretion of sodium cholorides, and bicarbonates with the urine, with equivalent loss of water, is increased. It can tentatively be suggested that the decrease in the volume of gastric juice can be explained by the increase in hematocrit index and by changes in the central and local conditions of the hemodynamics as a result of adrenalectomy.

The acid-forming function of the stomach, after total adrenalectomy on the dogs, in response to histamine showed no change and the pH of the gastric juice remained at the background level. After food loading a tendency was observed for the acidity to fall (Table 1). The H^+ concentration in the gastric juice may be determined by the following mutually opposin, factors: secretion of H^+ into the lumen of the stomach, the neutralizing effect of the interstitial fluid, the diffusion of H^+ into the mucous membrane. The secretion of H^+ and the outflow of interstitial fluid depend on the microcirculation of the blood in the mucous membrane; consequently, when the hemodynamics is disturbed, besides a fall in the level of secretion of the juice there must also be an increase in its pH. However, H^+ secretion also depends on the functional activity of the parietal cells. The absence of changes in pH in response to histamine loading can be regarded as a compensatory phenomenon and it reflects the absence of organic disturbances. The very small decrease in acid formation in response to food loading can be explained by changes in the hemodynamics of the stomach and by functional changes in the activity of the parietal cells as a result of adrenalectomy.

The greatest differences in the response to the different types of stimulation of gastric secretion were observed in the changes in proteolytic activity after adrenalectomy. In the background experiments pepsin secretion after histamine and after meat was virtually identical (Table 2). Most investigators accept Babkin's view [1] that the effect of histamine in this case is due to elution of the proteolytic enzymes by acid during secretion. After adrenalectomy the activity of the proteolytic enzymes in response to histamine was sharply reduced (Table 2). Meanwhile, the acid-forming function was unchanged. After food loading in adrenalectomized animals a significant increase in pepsin activity was observed in the first samples, possibly in connection with a decrease in the volume of secretion produced. Consequently, there is nothing to suggest that pepsin formation is reduced, i.e., the decrease in proteolytic activity in response to histamine was due to some other cause. Yet another point of view has been expressed on the character of histamine stimulation of the chief glands [10].

It has been suggested that histamine may stimulate the function of the chief cells. As a result of adrenalectomy, stimulation of the chief cells by histamine may perhaps become impossible, and only that component of secretion of proteolytic enzymes that is due to their elution by hydrochloric acid is preserved.

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