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REPARATIVE ACTION OF NUCLEIC ACID PREPARATIONS IN EXPERIMENTAL GASTRIC ULCER

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The search for new drugs for the treatment of peptic ulcer is an urgent task in gastroenterology. Of the many different preparations used to treat this disease, preference is still attached to H_2-blockers and to preparations alleged to stimulate regeneration.

This paper describes the results of a study of the effect of nucleic acid preparations on the healing of experimental gastric ulcers in rats: DNA (the sodium salt of native DNA), and ENKAD (yeast RNA hydrolysate), obtained by a method developed at the Institute of Biophysics, Ministry of Health of the USSR and the All-Union Cardiologic Scientific Center, Academy of Medical Sciences of the USSR [1].

EXPERIMENTAL METHOD

Experimental gastric ulcer was produced by Okabe's method [2] by application of acetic acid to the serous membrane of the stomach. The preparations were injected intramuscularly, starting with the 2nd day of experimental gastric ulcer. On the 14th day the animals were killed under ether anesthesia. The stomach was removed, divided along the greater curvature, and the area of the defect was measured; healing of the ulcer defect was determined by calculation of the ulcer index (UI), equal to the area of the lesion (in cm^2). Control animals were given physiological saline (K_1) or solcoseril intramuscularly (K_2) in a dose of 0.2 ml. The DNA preparation was injected in a dose of 30 mg/kg body weight (0.5 ml), The ENKAD preparation was injected in a dose of 30 mg/kg body weight intramuscularly once a day starting with the 2nd day of experimental gastric ulcer.

EXPERIMENTAL RESULTS

The experimental results are given in Table 1.

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TABLE 1. Ulcer Index of Acetate-Induced Gastric Ulcer (cm^2)

	n	UI	p
Control K_1, physiological saline	5	0,13±0,03	<0,05
Control K_2, solcoseril	6	0,08±0,01	<0,05
ENKAD preparation	5	0,05±0,007	<0,05

TABLE 2. Ulcer Index of Acetate-Induced Gastric Ulcer in Rats (cm^2)

	n	UI	p
K_1	5	0,13±0,03	
K_2	6	0,08±0,01	<0,05
DNA	7	0,04±0,003	<0,05

The morphological investigation showed that the defect was covered from the margins of the ulcer by uniformed mucous membrane, but in the middle part of the defect the mucous membrane was not yet formed and the defect was covered with high cylindrical epithelium. The distinguishing features of this group were the more marked lymphocytic infiltration of the floor of the ulcer nearer to the border with the liver, the formation of lymphatic follicles, and the more marked proliferation of the bile ducts.

Administration of this preparation was followed by the most completely formed mucous membrane at the site of the former ulcer. The mucous membrane had high rugae and deep pits. The surface epithelium and epithelium of the pits was high, and the newly formed mucous membrane covered the whole of the ulcer defect. It was located on the muscular lamina propria beneath which there was connective tissue, and on the border with the liver, where the ulcer penetrated, there were small areas of accumulation of lymphoid tissue and solitary ducts invading from the liver tissue.

In all the groups studied, including the controls, healing of the ulcer defect took place. In most cases the ulcer penetrated the liver, but in some cases the momentum and pancreas also. After administration of solcoseril the floor of the ulcer was covered by newly formed mucous membrane, located on the muscular lamina propria, but the newly formed mucous membrane was less highly differentiated than in the group receiving DNA. It contained cystic glands, and the rugae were not as high. After injection of physiological saline, newly formed mucous membrane could be seen just as after injection of solcoseril.

Comparison of the action of these preparations on healing of the ulcer defect indicates that healing was more effective as a result of DNA (UI = 0.04) than after administration of ENKAD (UI = 0.06) and of solcoseril (UI = 0.08). Incidentally DNA, unlike the other preparations, not only accelerates healing, but also increases the degree of differentiation of the newly formed mucous membrane.

The first results of the use of DNA and ENKAD in the treatment of experimental gastric ulcer in rats thus indicate that these preparations are highly effective, and a more detailed study of their antiulcerative action is indicated.

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