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Lack of Antianemic Principle in Human Liver from Case of Carcinoma of Stomach.

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(Introduced by Kenneth L. Burdon.)

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The relationship between gastric secretion and hematopoiesis is now generally accepted.^{1, 2, 3} There is also general agreement that the hematopoietic principle is formed by the stomach and stored in the liver.^{4, 5} After total gastrectomy the antianemic principle of hog's liver is depleted.^{6, 7} The most active antianemic principle is obtained from the mucosa of the pyloric antrum.^{8, 9}

Recently there has been demonstrated the absence of the "intrinsic factor" in the gastric juice of a patient with macrocytic anemia, who was shown by roentgenologic examination to have a scirrhus carcinoma of the stomach.¹⁰ Ventriculin was used as a control therapy. We have tested the antianemic potency of an extract prepared from the liver of a patient whose death was due to scirrhus carcinoma of the pyloric and prepyloric regions of the stomach. As control therapy we used an extract prepared from the normal liver of another patient whose death was caused by a cerebral hemorrhage.

In a patient with carcinoma of the stomach the necropsy was performed one hour after death. A scirrhus carcinoma was found involving the entire pyloric and prepyloric region. Histologic study showed that the entire mucosa of this portion of the stomach had been replaced by neoplastic growth. There was no evidence of visceral metastasis.

¹ Castle, *Am. J. Med. Sci.*, 1929, **178**, 748.

² Sturgis and Isaacs, *J. A. M. A.*, 1929, **93**, 747.

³ Castle and Ham, *J. A. M. A.*, 1936, **107**, 1456.

⁴ Morris, Schiff, Burger and Sherman, *J. A. M. A.*, 1932, **98**, 1080.

⁵ Greenspon, *J. A. M. A.*, 1936, **106**, 266.

⁶ Bence, *Z. f. klin. Med.*, 1933, **126**, 127.

⁷ Goodman, Geiger and Claiborn, *Proc. Soc. Exp. Biol. and Med.*, 1935, **32**, 810.

⁸ Henning and Brugsch, *Deutsche Med. Wochenschr.*, 1931, **57**, 757.

⁹ Meulengracht, *Z. f. klin. Med.*, 1936, **130**, 468.

¹⁰ Goldhamer, *Am. J. Med. Sci.*, 1938, **195**, 17.

At necropsy the liver and gastrointestinal tract of the patient who died of cerebral hemorrhage revealed no abnormalities.

The extracts from both livers were made according to the Lilly method (Solution Liver Extract—Lilly, N.N.R., 1937, p. 320), under exactly the same circumstances. The extracts, after having been passed through a Jenkins filter, were cultured and found to be sterile. When they were used experimentally on anesthetized dogs no significant quantities of either pressor or depressor substances were found.

The patient used for the determination of the presence of the antianemic principle had a typical Addisonian pernicious anemia in relapse, with nervous symptoms. Hematologic examination revealed 1,740,000 red blood cells and 4,800 white blood cells per cu mm, and 7.8 g or 56% hemoglobin (Hellige). The mean corpuscular volume was 132 cubic microns and the mean corpuscular hemoglobin was 45 micromicrograms. The percentage of reticulocytes was 1.1. Achlorhydria was persistent following the administration of histamine.

The intramuscular injection of 9 cc of liver extract, representing 126 g of liver from the patient with carcinoma of the stomach, failed to produce an increase in the reticulocyte count over a period of 9 days. On the 10th day after the first injection, the intramuscular injection of 9 cc of the control extract, representing 133 g of liver from the patient with cerebral hemorrhage, caused a marked elevation of the number of reticulocytes, which reached a peak of 22.0% on the 6th day after the second injection. By the 11th day the number of red blood cells had increased to 2,650,000 and the hemoglobin value had increased to 78%. The total period of observation was 20 days.

Summary. An extract was prepared from a human liver obtained from a patient whose death was due to carcinoma of the pyloric and prepyloric regions of the stomach. Its administration to a patient with Addisonian pernicious anemia in relapse failed to produce a reticulocytic response. A control extract was prepared from the liver of a patient whose death was due to cerebral hemorrhage. Its administration to the same patient caused a marked stimulation of hematopoiesis. It is of interest that the portions of gastric mucosa which were replaced by neoplastic tissue in the patient with carcinoma of the stomach were those which, according to experimental observations, are the most active in the production of the "intrinsic factor."