RESORPTION OF CASEIN LABELED WITH I\(^{131}\) AND METHIONIN
LABELED WITH S\(^{35}\) FROM THE DIGESTIVE TRACT AT VARIOUS
INTERVALS AFTER RESECTION OF TWO-THIRDS OF THE STOMACH

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(Presented by Academician V. N. Chernigovskii)
Translated from Byulleten' Eksperimental'noi Biologii i Meditsiny, Vol. 51, No. 4, pp. 43-47, April, 1961
Original article submitted February 11, 1960

The influence of stomach resection upon the resorptive capacity of the digestive tract has been inadequately studied. The assimilation of nutrient substances after stomach resection has attracted somewhat more attention [1, 2, 3].

Recently a number of authors used radioactive isotopes to study the process of resorption after stomach resection. It was a defect of these studies that they were carried out within short times after the operation not exceeding three-four weeks [5, 6].

Disorders in the resorption of fat labelled with I\(^{131}\) were observed in human subjects after Billroth II resection of the stomach. A group of Japanese authors [4] emphasized that in patients and in experimental animals the resorption of fat labelled with I\(^{131}\) and of protein labelled with P\(^{32}\) slowed down within a short time after total stomach resection. We set ourselves the task of following up experimentally the changes in the resorption of orally ingested protein or amino-acids from the intestine after extensive resection of the stomach.

In our opinion the results of such investigation would enhance our understanding concerning the causes of the alimentary disorders observed in patients after gastric operations.

METHODS

The experiments were carried out on dogs and consisted of the resection of the stomach according to the scheme of the Billroth II operation in the modification of Finsiter. Healthy animals served as control. Casein labelled with I\(^{131}\) and methionin labelled with S\(^{35}\) were used to study the resorption. The casein was iodized in the following manner: two mixtures were prepared: 1) 200 mg casein dissolved in 5 ml phosphate buffer (pH 8.6) and 2) 0.4% potassium iodide solution (4 ml) and a 0.4% solution of potassium iodate (2 ml). To this mixture we added a solution of I\(^{131}\) with an activity of 500-1000/\(\mu\)C. Before the protein was iodized one-two drops of 0.5 N hydrochloric acid were added into the second solution after which the latter solution was immediately added in small portions to the first solution under continuous mixing. The mixture was stored for two-three hours in the refrigerator and then the iodized protein was dialyzed against normal saline or against tap water. The dialyzate was checked with regard to the presence of excess I\(^{131}\). One of the control methods used consisted of the paper chromatography of the preparation obtained using NaI\(^{131}\) as indicator.

*The gastric operations were carried out by the research worker N. Sh. Amirov, for which we express our gratitude.
Fig. 1. Rate of resorption of breakdown products of casein labelled with $^{118}$I in the digestive tract. 1,2,3,4—control experiments (curves 1 and 2: the dog Veta, the curves 3 and 4: the dog Gaga); 5,6,7,8,9—experiments on the dog Veta after resection of the stomach (curve 5: 36 days after the resection; curve 6: three months and 26 days; curve 7: seven months and 13 days; curve 8: seven months and 20 days; curve 9: ten months and five days after the resection) (in this experiment a large volume of the mixture—250 ml instead of 150 ml—was given).

Fig. 2. Rate of resorption of breakdown products of casein labelled with $^{118}$I in the digestive tract. Experiments on the dog Nag. 1,2—control experiments; 3,4,5—after stomach resection (curve 3: 37 days, curve 4: four months, curve 5: seven months (15 days) after the resection).