THE INFLUENCE OF RESECTION OF TWO-THIRDS OF THE STOMACH UPON THE RESORPTION OF SODIUM PHOSPHATE (P\(^{32}\)) FROM THE DIGESTIVE TRACT AND ITS UTILIZATION IN THE ANIMAL BODY

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In an earlier publication [2] we were able to show that disorders of the resorption of breakdown products of casein labelled with \(^{131}\)I and methionine labelled with \(^{35}\)S in the digestive tract can be observed in dogs after resection of the stomach according to Billroth II in the modification of Finsterer. These changes were due to disorders of the evacuatory function of the stomach stump.

After the resection of the stomach the resorption shows changes immediately after as well as at later periods after the operation. The observation was continued for a period between one and 16 months after the operation.

With the aid of radioactive sodium phosphate (P\(^{32}\)) used as indicator we collected an extensive experimental material which characterized the resorption capacity of the digestive tract in various functional states: during the stimulation of the n. vagus and the receptor zone of the stomach; during blockage of the vegetative nervous system with atropine, after transection of the n. vagus, in anemia, caused by denervation of the fundus and corpus and under other conditions [2, 3, 4]. A fact established by us in an earlier investigation: changes in the resorption of phosphate from the intestine and in its utilization in the body in pathological conditions of the liver ought to be particularly emphasized.

There are reports in the literature according to which stomach resection creates conditions for the development of a pathological process in the liver. In view of this fact, we found it necessary to study on one and the same animal at various periods after the stomach resection the resorption of phosphate from the intestine and to compare the changes found with those changes which had been found by us in cases of hepatitis.

The present investigation was carried out simultaneously with the investigations concerning the resorption of breakdown products of casein labelled with \(^{131}\)I and methionine labelled with \(^{35}\)S on the same dogs [5].

METHODS OF EXPERIMENTS

Seven dogs were used for the experiments. In five of them stomach resection by the method of Billroth II in the modification of Finsterer was carried out. The rate of resorption of sodium phosphate (\(\text{Na}_2\text{HPO}_4\)) and its utilization in the animal body were initially studied in control experiment before the resection of two-thirds of the stomach and then at various periods after the operation. The longest period of observation lasted 16 months.
Fig. 1. Rate of resorption of $^{32}$P from the digestive tract and its utilization under normal conditions and at various times after stomach resection. a) The dog Rus: curve 1) Normal conditions; after resection of the stomach: curve 2) after one month; curve 3) after three months; curve 4) after seven months; curve 5) after eleven months; b) the dog Veta: curves 1 and 2) Normal conditions; after resection of the stomach: curve 3) after three months; curve 4) after ten months; c) the dog Silacs after resection of the stomach: curve 1) after one month ten days; curve 2) after three months ten days; curve 3) after six months; curve 4) after 12 months; d) the dog Naf: the curves 1 and 2) normal conditions; after resection of the stomach: curve 3) after four months; curve 4) after 14 months.

Radioactive sodium phosphate ($Na_2HPO_{4}^{32}$) in a dose of 100-200 counts per 1 g weight was given to the dogs on an empty stomach in a mixture of milk and water (total volume 150-200 ml). The blood was taken at strictly observed intervals after the administration of $^{32}$P (after 30, 60, 90, 120, 180, 240, 300, and 360 mins). The total phosphorus content and the radioactivity of the blood serum were estimated. The specific activity of the total phosphorus of the blood serum was estimated by the method described in earlier publications [4].