

Absorption of Histamine From the Intestine of the Parathyroidectomized Dog.

R. W. ALBI AND T. E. BOYD.

From the Department of Physiology and Pharmacology, Loyola University School of Medicine, Chicago, Illinois.

In 1912 Carlson¹ described pathological changes in the stomach and upper intestine in dogs which had died as a result of parathyroidectomy. Spadolini² has made similar observations, and holds that the condition involves an increased permeability of the intestinal mucosa. He believes that the syndrome which follows loss of the parathyroids may be due, at least in part, to increased absorption of toxic substances produced by proteolytic bacteria. Condorelli³ has also found changes in the intestinal mucosa following parathyroidectomy, although he does not agree with Spadolini as to their significance.

There is no direct evidence, so far as we know, that loss of the parathyroids facilitates the absorption of any specific substance from the intestine. Histamine is produced there by proteolytic bacteria, and its toxic properties are well known. As shown in the accompanying paper, the mucosa may be rendered permeable to it by relatively mild chemical agents. It seemed possible that a similar change in permeability might occur after loss of the parathyroids, in view of the extensive damage to the mucosa which has been described. If so, some support would be given to the toxemia theory of Spadolini.

Experiments were carried out on 8 dogs, each being used 6 to 8 days after removal of the parathyroids and thyroids. All of the series had shown repeated attacks of tetany. Four additional animals were operated on. Two of these never developed symptoms and were discarded. Two others died under anesthesia before the experiment was completed.

Sodium barbital was the anesthetic employed. With arterial blood pressure and respiration being recorded, ergamine acid phosphate (Burroughs, Wellcome) was introduced into the duodenum, through a tube arranged as described in the accompanying paper. The dosage was 10 mg. per kilo body weight.

¹ Carlson, A. J., *Am. J. Physiol.*, 1912, xxx, 338.

² Spadolini, I., *Arch. di fisiol.*, 1927, xxv, 739.

³ Condorelli, Luigi, *Boll. d. soc. ital. di biol. sper.*, 1927, ii, 646.

In no instance was the blood pressure affected. The results were entirely negative, as with the controls. Koessler and Hanke⁴ obtained similar negative results with normal dogs.

Of the 10 animals which had been in tetany, 9 showed no gross changes in the gastro-intestinal tract. The tenth showed a few slightly hyperemic areas in the duodenal mucosa. Microscopic examination was not made. The discrepancy between these findings and those cited above may be due to (1) the fact that our animals were killed under anesthesia before the tetany had run its full course, or (2) to the diet we gave, which was of milk and white bread.

The experiments show, however, that repeated and severe attacks of tetany may occur in the absence of any demonstrable change in permeability of the intestinal mucosa, at least toward histamine. It is still possible, of course, that the absorption of other substances may be affected.

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Action of Insulin on the Gastric Motility of Man.

J. P. QUIGLEY. (Introduced by A. J. Carlson.)

From the Department of Physiology of the University of Chicago.

Using the triple balloon technique it has been demonstrated that:

1. Subcutaneous injection of insulin in amounts of 12-20 units usually produces in normal human subjects fasting 11-44 hours an increase in gastric motility.

2. The essential features of this response are (a) an increase in gastric tone, (b) type A contractions, (c) a very prolonged hunger period.

3. The gastric hypermotility induced by insulin is not inhibited by smoking, mild nausea, unpleasant emotions, body discomfort, sight or thought of food, extraneous disturbances, swallowing or the presence of indifferent substances or food in the mouth or in the stomach.

4. The gastric motility is inhibited by introduction of dextrose or cane sugar into the duodenum, and also by the subcutaneous injection of atropine or epinephrine.

⁴ Koessler, K. K., and Hanke, M. T., *J. Biol. Chem.*, 1924, lix, 889.