The Output of HCl in Gastric Juice and Free Histamine in Urine during Stimulation of Gastric Secretion

W.T.	Irvine
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London

Simultaneous determinations have been made of the hourly outputs of free histamine excreted in the urine and of free hydrochloric acid secreted in the gastric juice from Heidenhain pouches in dogs after the ingestion of meals of meat. An effort was made to separate the

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secretory response of the stomach to the meal into its intestinal and gastric components and to determine if a relationship exists between free histamine in the urine and free acid in the gastric juice during either or both of these phases. In addition, the output of free histamine in the urine has been estimated during active nervous secretion of the stomach, produced by insulin hypoglycaemia in dogs with gastric stomas.

When a meat meal was fed by mouth the rough parallelism, previously noted by others, between output of acid by the pouch and output of free histamine in the urine was verified.

When the meat was introduced directly into the small bowel the concentration of free histamine in the urine increased, the peak being reached in the second hour after the meal. The concentration of histamine in the urine then decreased rapidly and control levels were reached by the fifth and sixth hours. The acid response was usually small or absent at the time of this increased output of histamine in the urine and was maximal between the fourth and seventh hours after the meal when the output of histamine in the urine had returned basal levels. The concentration of histamine in the urine did not increase after ingestion of a meal of bread and milk.

A meal of meat placed in the isolated stomach produced active secretion of acid from the Heidenhain pouch but no increase of histamine in the urine. When this meal was removed from the stomach and introduced into the jejunum the output of histamine in the urine increased rapidly during the next 3 hours.

During active nervous secretion of the stomach induced by insulin hypoglycaemia, the concentration of free histamine in the urine did not increase.

It was concluded that the appearance of free histamine in the urine which follows the ingestion of a meal of meat was unrelated to gastric secretion. This histamine content of the meat meal was found to be too small to account for it.

Meat contains L-histidine which is decarboxylated to histamine by bacteria in the intestinal lumen and it was considered possible that this process might account for the increase in free histamine in the urine after a meat meal. In man it was found that the output of free histamine in the urine produced by a meat meal was paralleled when the L-histidine content of the meal was

given alone and in both types of test sterilization of the alimentary tract greatly reduced the urinary histamine.