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17182. Stimulation of Gastric Secretion in Man by Theophylline Ethylenediamine.

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Roth and Ivy¹⁻³ reported that caffeine parenterally or intragastrically, stimulates gastric secretion in cat and man. They noted no effect when caffeine was given alone in the dog. Robertson and Ivy⁴ observed that caffeine and theophylline potentiate the effect of histamine on gastric secretion in dogs, but did not stimulate when given alone. Wood⁵ noted that in some cats theophylline and theobromine alone stimulated gastric secretion. No reference to the effect of theophylline on gastric secretion in man could be found in the literature, and so the present study was undertaken.

Method. After a 12 hour fast, a Levine tube was introduced into the stomach and the

contents aspirated at 15 minute intervals. After the fourth sample was withdrawn, 0.5 g of theophylline ethylenediamine was administered slowly intravenously dissolved in 10 cc of physiological saline, or through the stomach tube in 200 cc of water. The gastric contents were aspirated at 15 minute intervals thereafter for 90 minutes except that with the orally administered drug the first period after introduction of the drug into the stomach was 20 minutes in length instead of 15 minutes. For each sample the total milligrams of free acid was determined. Ten subjects received the theophylline intravenously and ten received the theophylline through the stomach tube.

Results and comment. The results obtained with intravenous administration are shown in Fig. 1, with oral administration in Fig. 2. The maximum effect of theophylline is noted 15 minutes after intravenous administration, whereas with the oral preparation the maximum effect occurred 45 minutes after administration.

These results indicate that theophylline is

¹ Roth, J. A., and Ivy, A. C., *Am. J. Physiol.*, 1944, **141**, 454.

² Roth, J. A., and Ivy, A. C., *Gastroenterology*, 1944, **2**, 274.

³ Roth, J. A., and Ivy, A. C., *Am. J. Physiol.*, 1944, **142**, 107.

⁴ Robertson, C., and Ivy, A. C., *Fed. Proc.*, 1949, **8**, 133.

⁵ Wood, D. R., *British Med. J.*, 1948, **2**, 283.

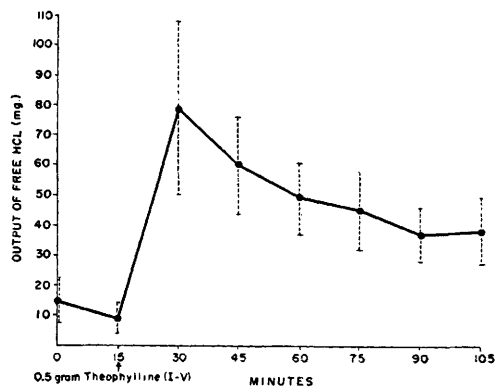


FIG. 1.

Stimulation of free HCl output by intravenous administration of theophylline ethylenediamine. Each dot represents the mean value of determinations on 10 subjects. The vertical bars represent the standard errors of the respective means.

similar to caffeine in its effect on gastric secretion in man.

In the course of the study 3 patients received a tablet form of theophylline with variable response, and 4 patients received theobromine orally with no gastric stimulation.

No decision can be made as to whether the

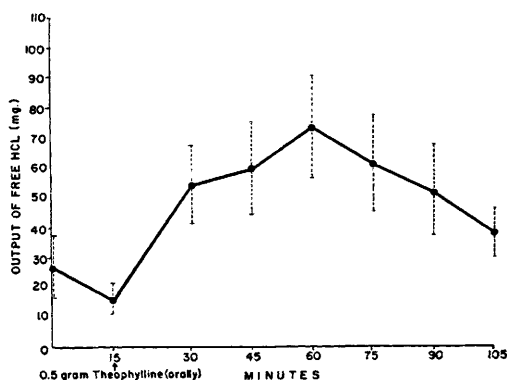


FIG. 2.

Stimulation of free HCl output by oral administration of theophylline ethylenediamine. See legend of Fig. 1.

stimulation produced by orally administered aminophylline is due to direct local action or to an action after absorption.

Summary. Theophylline stimulates the secretion of acid gastric juice in man on oral or intravenous administration.

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17183. Bacterial Conversion of Dextrin into a Polysaccharide with the Serological Properties of Dextran.

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The purpose of the present paper is to report the capacity of certain acetic acid bacteria, and of cell-free solutions of enzymes obtained from them, to synthesize from dextrin material with serological properties like those which we have earlier described for dextran.¹ Hitherto, the only enzymatic pathway known for the synthesis of dextran was that from sucrose.^{2,3} We know of no report of interconversion of material of the starch-

glycogen class and dextran, although both possess related chemical structures and can indeed be synthesized from the same substrate (sucrose) by appropriate bacterial enzyme systems.²⁻⁵ Ultimate proof of the biological synthesis of dextran from dextrin must of course rest upon chemical studies, which are now in progress. However, the unequivocal nature of the present serological data leaves little doubt that such a conversion does in fact occur.

British brewing bacteriologists⁶⁻¹¹ have for

¹ Sugg, J. Y., and Hehre, E. J., *J. Immunol.*, 1942, **43**, 119.

² Hehre, E. J., and Sugg, J. Y., *J. Exp. Med.*, 1942, **75**, 339.

³ Hehre, E. J., *J. Biol. Chem.*, 1946, **163**, 221.

⁴ Hehre, E. J., and Hamilton, D. M., *J. Bact.*, 1948, **55**, 197.

⁵ Hehre, E. J., *J. Biol. Chem.*, 1949, **177**, 267.