

effective against bethanechol. In the seven experiments in which the pH of the secretion remained below 3.0 the ratio of MBF to secretory rate rose (55.0 ± 16.6). We conclude that atropine does not inhibit acid secretion by decreasing MBF.

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The effect of atropine on pentagastrin-induced gastric acid secretion and mucosal blood flow in the conscious rat

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Atropine is known to decrease gastric acid secretion in response to a variety of stimuli (Hirschowitz & Sachs, 1969; Johansson, Lundell & Svensson, 1971). In the present series of experiments the effect of atropine 100 $\mu\text{g/kg}$ i.v. was investigated for its effect on pentagastrin-induced gastric acid secretion and gastric mucosal blood flow in the conscious rat.

Male and female Wistar rats were provided with either vagally innervated (Pavlov) pouches or vagally denervated (Heidenhain) pouches using established surgical procedures (Svensson, 1970). Three weeks later indwelling vascular catheters (Weeks, personal communication) were implanted. Drugs were dissolved in sterile pyrogen-free saline and administered via the jugular catheter. Acid secretion was collected by pouch perfusion and measured every 15 min by titration to pH 7.4 using an automatic titrator. The results were expressed in $\mu\text{Eq H}^+ \text{min}^{-1}$. Blood samples (0.01 ml) were withdrawn via a catheter in the carotid artery. Mucosal blood flow (MBF) in ml min^{-1} was estimated using the radioactive aniline clearance method developed for the conscious dog (Curwain & Holton, 1973) and adapted for use in the conscious rat. 18 h before each experiment food was withdrawn but water and Tyrode's solution allowed. Pentagastrin dose-response curves for each rat were determined and the dose which produced secretion at about 50% maximum was used for the rest of the study. A

steady plateau of acid secretion and MBF was first obtained using pentagastrin. The ratio of mucosal blood flow to acid secretion was steady at $0.09 \pm 0.011 \text{ ml } (\mu\text{Eq H}^+)^{-1}$. The effect of atropine was calculated from the mean secretory rate and MBF of the three samples at 30, 45 and 60 min after atropine compared with the three samples immediately before giving atropine. The results are expressed as percentages s.e. mean.

In eleven experiments on three rats with Pavlov pouches and three rats with Heidenhain pouches atropine caused a $75.8 \pm 2.95\%$ fall in acid secretion with only a $39.8 \pm 3.17\%$ fall in MBF. No significant difference was found between the extent of inhibition in the two types of pouches. Acid secretion and MBF after atropine were significantly different from their pre-atropine levels. The percent decrease in MBF was also significantly different from the percent decrease in acid secretion.

An increase in the ratio of MBF to secretory rate was always seen, indicating a primary effect on the secretory apparatus and not blood flow.

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