

Prostaglandins and the contractile action of bradykinin on the longitudinal muscle of rat isolated ileum

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It has been reported that prostaglandins may participate in the contractile action of bradykinin upon the longitudinal muscle of rat isolated terminal ileum (Crocker & Willavoys, 1976). In this investigation the interrelationship was studied further.

The terminal ileum was removed from male Wistar rats (180–250 g) placed under a 1 g tension and perfused through the lumen at 3 ml/min with Krebs solution at 37°C, bubbled with 5% CO₂ in O₂. The effluent was superfused over a rat fundus strip simultaneously with a Krebs solution (3 ml/min) containing antagonists (Gilmore, Vane & Wyllie, 1968) and indomethacin (2.8 µM). All contractions were recorded isometrically.

Bradykinin (0.2 ml) was injected into the Krebs solution prior to perfusion of either the mucosal surface of the ileum or the serosal surface after eversion of the ileum. After both mucosal and serosal application the log dose response curves on the rat fundus strip to bradykinin were moved to the left with a mean increase of $11.1 \pm 1\%$ ($n = 5$) $P < 0.01$ and $12.5 \pm 1\%$ ($n = 5$) $P < 0.01$ respectively between the 30% to 75% response limits. This potentiation was

not observed when the prostaglandin synthetase inhibitors indomethacin (28 µM) or aspirin (610 µM) were added to the perfusion solution.

The longitudinal muscle contractions of the ileum to bradykinin perfused over the serosal surface were unaffected by either indomethacin (28 µM) or aspirin (610 µM). However, all contractions to bradykinin on the mucosal surface were markedly reduced by the addition of indomethacin (28 µM) or aspirin (610 µM) and the maximal contraction was reduced by $80 \pm 5\%$ ($n = 5$) $P < 0.001$ and $53 \pm 6\%$ ($n = 5$) $P < 0.001$ respectively.

Therefore contractions of rat fundus strip to bradykinin are potentiated by a prostaglandin-like substance released during perfusion of both the mucosal and the serosal surface of rat terminal ileum. However the longitudinal muscle contractions of the ileum are unaffected by inhibitors of prostaglandin synthesis when bradykinin is perfused over the serosal surface but markedly reduced when perfused over the mucosal surface.

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References

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