THE EFFECTS OF TACHYKININS ON GASTRIC MOTILITY IN THE GUINEA PIG

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1. The effects of five tachykinins on gastric motility were investigated by infusing them into the gastropancreaticosplenic artery in anesthetized guinea pig.
2. Physalaemin (Phy ; 3.3～330pmol) and substance P (SP ; 33pmol～1nmol) caused dose-dependent relaxation of the stomach. Phy was over 5–fold more potent than SP. Substance K (SK ; 1～100pmol) and eledoisin-related peptide (Ele-RP ; 33pmol～1nmol) induced dose-dependent contraction of the stomach. SK was over 10–fold more potent than Ele-RP. Eledoisin (Ele ; 33pmol～1nmol) produced various responses of the stomach such as contraction, relaxation and contraction followed by relaxation in different animals.
3. All five tachykinins caused dose-dependent hypotensive responses. The order of potency was Phy＞SP≧Ele≫SK＞Ele-RP.
4. Phy-induced relaxation of the stomach was reduced by guanethidine and was reversed to contraction by tetrodotoxin (TTX), but was not affected by atropine, hexamethonium and cervical vagotomy.
5. The contractile response to SK was reduced by atropine and was potentiated by guanethidine or TTX. Hexamethonium and cervical vagotomy had no significant effect on SK-induced contraction.
6. These results suggest that Phy causes relaxation of the guinea pig stomach through non-adrenergic, non-cholinergic inhibitory nerves. It is also suggested that SK evokes contraction of the stomach mainly by direct action, which is modulated by both cholinergic and adrenergic nerves. According to the classification of receptor subtypes by Buck et al. (1984), it seems likely that both relaxation of the stomach and hypotention are mediated by SP-P tachykinin receptors, and that contraction of the stomach is mediated by SP-K tachykinin receptors in the guinea pig.