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## ANALYSIS OF CONTRACTION AND VASODILATATION EVOKED BY GREATER SPLANCHNIC NERVE STIMULATION IN THE DOG STOMACH

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The aim of present experiments was to investigate the mechanism of contraction and vasodilatation in response to stimulation of preganglionic fibers of the splanchnic nerve in the dog stomach.

1. High-intensity splanchnic nerve stimulation (40V, 1ms) caused a frequency-dependent gastric contraction and a decrease, followed by an increase, in gastric blood flow.
2. The contractile response to splanchnic nerve stimulation tended to be enhanced by injection of hexamethonium (C6; 10mg/kg, i.v.), and the biphasic blood flow response changed to an increase in blood flow (vasodilatation). Subsequent treatment with atropine (1mg/kg, i.v.) reduced the amplitude of the gastric contraction and the vasodilatation in response to the stimulation.
3. Close arterial injection of substance P (SP) caused a dose-dependent gastric contraction and vasodilatation. Spantide (20 nmol/min), a SP receptor-blocking agent, inhibited the vasodilatation but not the gastric contraction.
4. Spantide inhibited the C6- and atropine-resistant vasodilatation, without any effects on the gastric contraction evoked by splanchnic nerve stimulation as SP did.
5. Naloxone (1mg/kg, i.v.), an opiate receptor blocking agent, potentiated the C6-resistant, and C6- and atropine-resistant gastric contractions, but did not affect the vasodilatation in response to splanchnic nerve stimulation.
6. Splanchnic nerve stimulation caused a rise in the SP concentration in gastric venous, but not arterial, plasma, regardless of the administration of C6- or atropine in combination.
7. The vasoactive intestinal polypeptide concentration in gastric venous plasma was hardly affected by splanchnic nerve stimulation. Calcitonin gene-related peptide was much less potent for vasodilatation than SP.
8. The present results suggest that gastric contraction and vasodilatation in response to stimulation of the greater splanchnic nerve are mediated by the activation of the afferent fibers in this nerve, and that SP released from the afferent fibers causes vasodilatation resistant to both C6 and atropine.