Sympathoinhibitory action of nociceptin in the rat spinal cord

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摘要

Abstract

1. Whole-cell patch recordings were made from antidromically identified sympathetic preganglionic neurons (SPN) of immature rat spinal cord slices. Bath application of nociceptin (0.1-1 micromol/L) suppressed excitatory postsynaptic potentials (EPSP)and hyperpolarized a population of SPN; these effects were naloxone (1 micromol/L) insensitive. 2. Nociceptin suppressed the amplitude of EPSP without causing a concomitant change in glutamate-induced depolarizations, suggesting a presynaptic inhibitory action. 3. Analysis of current-voltage relationships showed that nociceptin hyperpolarized SPN by increasing an inwardly rectifying K+ current. 4. Intrathecal injection of nociceptin (3, 10 and 30 nmol) to urethane-anaesthetized rats dose-dependently reduced the mean arterial pressure and heart rate; these effects were not prevented by prior intravenous injection of naloxone (1 mg/kg). 5. Results from our in vitro and in vivo experiments suggest that nociceptin suppresses spinal sympatheticoutflow either by attenuating excitatory synaptic responses or hyperpolarizing SPN.