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NALOXONE BLOCKS A SUPPRESSION OF COUGH BY CODEINE IN ANESTHETIZED RABBITS

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Recently, we have shown the central antitussive effect of codeine administered in anesthetized rabbits. ?-opioid receptors being involved in cough production, are abundantly expressed in the brainstem areas such as the ambigual, solitary tract, parabrachial, raphe nuclei, and periaqueductal gray matter. Codeine is a potent ?-opioid receptor agonist. The effects of Naloxone (m-opioid receptor competitive antagonist) on the mechanically induced tracheobronchial cough and on the cough suppressing effect of codeine were examined in 6 pentobarbitone anesthetized spontaneously breathing rabbits (6 males; 2.85 ? 0.10 kg). A single dose of naloxone (Naloxoni hydrochloridum, WZ F Polfa) was injected intravenously (i.v.; 0.4 mg/kg) followed by a single i.v. dose of codeine (Codeinum Dihydrogenphosphate, Interpharm; 7 mg/kg). The number and amplitudes of both the cough and sneeze reflexes induced mechanically were examined sequentially (before injections, after the naloxone administration, and following the codeine injection). Both, the naloxone and codeine i.v. injections did not reduce neither coughing nor sneezing. We found no statistically significant differences in the number of the reflexes or in the diaphragm and abdominal muscles electromyographic moving averages as well as in the inspiratory and expiratory esophageal pressure amplitudes (all $P>0.05$). However, we dectected the tendency for a rise in an expiratory motor drive during coughing and sneezing after injection of naloxone in our animals. The respiratory rate was significantly higher after the injections of naloxone (and following codeine one) in comparison with control ($P<0.001$). No significant differences in arterial systolic and diastolic blood pressures were observed. Our results in anesthetized rabbits confirm the involvement of m-opioid mechanism mediating the central antitussive effect of codeine.

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