Antinociception of Heterotopic Electro-Acupuncture Mediated by the Dorsolateral Funiculus

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We investigated the inhibitory pathways that mediate the antinociceptive effects of heterotopic electro-acupuncture (EA) on formalin injection-induced pain in rats. EA (2 ms, 10 Hz, 3 mA) was delivered to heterotopic acupoints HT7 and PC7 for 30 min; this was followed immediately by subcutaneous injection of formalin into the left hind paw of rats. Naltrexone (10 mg/kg, i.p.), an opioid receptor antagonist, was administered to evaluate the involvement of endogenous opioids. The dorsolateral funiculus (DLF), which is a descending pathway that inhibits pain, was transected at the ipsilateral T10-L1 level of the thoracic spinal cord. EA inhibited behavioral responses to formalin injection-induced pain and prevented the pain-induced increase in cFos expression in the lambar spinal cord. Pretreatment with naltrexone did not inhibit the antinociceptive effects of EA on formalin injection-induced pain. Transection of the DLF ipsilateral to the acupuncture site eliminated the antinociceptive effects of EA. These results suggest that the antinociceptive effects of heterotopic EA are mediated by the DLF and not by endogenous opioids.

Keywords: Formalin Test; Antinociception; Electro-Acupuncture; Dorsolateral Funiculus.