Electroacupuncture-induced analgesia in a rat model of ankle sprain pain is mediated by spinal α-adrenoceptors

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In a previous study, we showed that electroacupuncture (EA) applied to the SI-6 point on the contralateral forelimb produces long-lasting and powerful analgesia in pain caused by ankle sprain in a rat model. To investigate the underlying mechanism of EA analgesia, the present study tested the effects of various antagonists on known endogenous analgesic systems in this model. Ankle sprain was induced in anesthetized rats by overextending their right ankle with repeated forceful plantar flexion and inversion of the foot. When rats developed pain behaviors (a reduction in weight-bearing of the affected hind limb), EA was applied to the SI-6 point on the contralateral forelimb for 30 min under halothane anesthesia. EA significantly improved the weight-bearing capacity of the affected hind limb for 2 h, suggesting an analgesic effect. The α-adrenoceptor antagonists phentolamine (2 mg/kg, i.p. or 30 µg, i.t.) completely blocked the EA-induced analgesia, whereas naloxone (1 mg/kg, i.p.) failed to block the effect. These results suggest that EA-induced analgesia is mediated by α-adrenoceptor mechanisms. Further experiments showed that intrathecal administration of yohimbine, an α2-adrenergic antagonist, reduced the EA-induced analgesia in a dose-dependent manner, whereas terazosin, an α1-adrenergic antagonist, did not produce any effect. These data suggest that the analgesic effect of EA in ankle sprain pain is, at least in part, mediated by spinal α2-adrenoceptor mechanisms.

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