Analgesic effects by electroacupuncture were decreased in inducible nitric oxide synthase knockout mice

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Background: This study was designed to investigate the involvement of inducible nitric oxide synthase (iNOS) in electroacupuncture (EA)-induced analgesia.

Methods: Two and 100 Hz EA stimulation were applied at acupoint ST 36 (Zusanli) in NOS knockout mice (iNOS−/−). Needles were inserted 5 mm in depth in ST36. After insertion, the needles were fixed in situ with adhesive tape. EA was applied after the basal threshold determination. The EA parameters were set as follows: constant square wave current output (pulse width: 0.6 ms at 2 Hz and 0.2 ms at 100 Hz) and 2 mA intensities. EA was performed for 30 minutes and tail-flick latencies (TFLs) were evaluated every 15 minutes for 1 hour.

Results: In 2 Hz EA stimulation, the tail-flick response (TFR) of wild-type mice for durations of 0, 15, 30, 45 and 60 minutes were 2.70 ± 0.26, 4.19 ± 0.37, 4.17 ± 0.34, 3.57 ± 0.27 and 3.39 ± 0.32 seconds of TFLs. Meanwhile, NOS−/− mice showed 4.10 ± 0.33, 4.77 ± 0.24, 5.26 ± 0.30, 4.48 ± 0.33 and 5.00 ± 0.41 seconds of TFLs. In 100 Hz EA stimulation, the TFR of wild-type mice were 3.01 ± 0.24, 4.67 ± 0.31, 4.76 ± 0.25, 4.04 ± 0.45 and 4.26 ± 0.30 seconds of TFLs. The NOS−/− mice were 4.33 ± 0.16, 5.29 ± 0.28, 5.06 ± 0.35, 4.52 ± 0.17 and 4.80 ± 0.28 seconds of TFLs. Wild-type mice exhibited 63.9% increase in TFL compared to the baseline after 2 Hz EA, whereas the NOS knockout mice exhibited 32.9% increase in TFL. The TFL after 100 Hz EA showed similar trends: 66.5% increase in TFL in wild-type mice and 18.3% increase in the NOS knockout mice.

Conclusion: The present findings suggested that NOS may play a crucial role in both low- and high-frequency EA-induced analgesic effects. [NeuroRes 2007; 29: S28-S31]

Keywords: Electroacupuncture; tail-flick; nitric oxide synthase; knockout mice; analgesia

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