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Efficacy and safety of transcutaneous electrical acupoint stimulation to treat muscle spasticity following brain injury: A double-blinded, multicenter, randomized controlled trial

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Objective: This study was aimed at evaluating the clinical efficacy and safety of Transcutaneous Electrical Acupoint Stimulation (TEAS) to treat muscle spasticity after brain injury.

Methods: A total of 60 patients with muscle spasticity after brain injury were randomized to the following 3 groups: 100, 2 and 0 Hz (sham) TEAS. The acupoints Hegu (LI4) Yuji (LU10) and Zusanli (ST36) Chengshan (BL57) on the injured side were stimulated at 0, 2, or 100 Hz, 5 times per week for 4 weeks. The patients were followed up for 1 and 2 months after the treatments. The effects of the treatments on muscle spasticity at the wrist, thumb, the other 4 fingers, elbow, shoulder, knee and ankle were evaluated by the Modified Ashworth Scale, and the effects on disability were assessed by the Disability Assessment Scale. The walking capability was evaluated by the Holden functional ambulation classification score. The overall performance was assessed by the Global Assessment Scale score and the improved Barthel Index. The safety of the treatments administered was also monitored.

Results: The wrist spasticity was significantly reduced from baseline at weeks 2, 3 and 4 of treatment and at the 1 and 2 month follow-up visits in the 100 Hz group ($P<0.01$). Compared with 2 Hz or sham TEAS, 100 Hz TEAS decreased wrist spasticity at weeks 2, 3 and 4 of treatment and 1 month after treatment ($P<0.001$). The other endpoints were not affected by the treatments. No treatment emergent adverse events were reported during treatments and follow-up visits.

Conclusions: TEAS appears to be a safe and effective therapy to relieve muscle spasticity after brain injury, although large-scale studies are required to further verify the findings.

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