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## The treatment of electro-acupuncture for patients with erectile dysfunction secondary to spinal cord injury

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### Abstract

**Objective:** To evaluate the effect and safety of electro-acupuncture therapy for patients with erectile dysfunction (ED) secondary to spinal cord injury (SCI).

**Methods:** SCI patients with NDU received electro-acupuncture therapy between February 2019 and December 2021. Patients were evaluated at baseline and week 4. The outcomes including International Index of Erectile Function (IIEF), the mean value for rigidity and duration during nocturnal penile tumescence recordings (NPTR). Adverse events were recorded.

**Results:** 12 SCI patients were recruited in this trial. Significant differences between baseline and week 4 after treatment with respect to mean IIEF (9.37 vs. 12.51,  $P = 0.046$ ), the mean value for rigidity (47.68% vs. 62.03%,  $P = 0.038$ ) and mean duration (7.02 min vs. 11.46 min,  $P = 0.042$ ) during NPTR. No patients reported adverse events.

**Conclusions:** electro-acupuncture is effective and safe for SCI patients with ED.

**Keywords:** electro-acupuncture, erectile dysfunction, spinal cord injury

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### Introduction

Spinal cord injury (SCI) is one of the leading causes of disability worldwide. Prevalence of traumatic SCI in developed countries ranges from 280 to 906/million<sup>[1]</sup>. Almost all male SCI patients report deficits in erectile dysfunction (ED) which dramatically impact Patients quality of life<sup>[2]</sup>. In the past ten years, as one of the most important branches of traditional Chinese medicine, acupuncture combining active electrical stimulation have improved erectile function for patients suffering from ED<sup>[3]</sup>. However, few of these studies adopt nocturnal penile tumescence (NPT) as the gold standard to objectively assess the penile tumescence and rigidity. Therefore, the objective of this study was to evaluate acupuncture therapy on patients with ED secondary to SCI.

### Materials and Methods

This prospective trial was undertaken between February 2019 and December 2021. Electro-acupuncture was performed on the acupoint of Sanyinjiao (Three cuns above the tip of the medial malleolus just posterior to tibial border), Taixi (Midway between the tip of medial malleolus and tendo calcaneus), Shenmen (On the ulnar side of the wrist, on the posterior border of the pisiform bone, in the depression at the radial side of the tendon of musculus flexor carpi ulnaris) and Guan Yuan (Three cuns below the umbilicus, in the midline) which have demonstrated the potential benefits for ED for a period of 4 weeks<sup>[4]</sup>. The outcomes including International Index of Erectile Function (IIEF), the mean value for rigidity and duration during nocturnal penile tumescence recordings (NPTR). Adverse events were also recorded. The study was approved by each hospital's Ethics Committee. Student's t-test was used for comparison of related variables and results are presented as means  $\pm$  standard deviation. The chi-square test was used for categorical data. A P value of 0.05 or less was considered statistically significant. Statistical analyses were performed with SPSS 13.0 software (SPSS, Inc., Chicago, IL).

### Results

The mean age of the 12 patients enrolled in the study was 29.3 years (range, 22-43 years) and the mean duration of ED was 2.3 years (range, 0.8-9 years). There were 11 patients with thoracic level SCI, and 1 patient with a lumbar level injury. Most patients had previously attempted therapy for ED including oral sildenafil, intracavernosal injection (ICI), intraurethral alprostadil therapy, and a vacuum pump. As listed in Table 1, significant differences between baseline and week 4 after treatment with respect to IIEF (9.37 vs. 12.51,  $P = 0.046$ ), the mean value for rigidity (47.68% vs. 62.03%,  $P = 0.038$ ) and mean duration during NPTR (7.02 min vs. 11.46 min,  $P = 0.042$ ), respectively. No patients reported adverse events.

### Discussion

Acupuncture is a traditional Chinese medicine characterized by no or few side effects. It has been recommended widely for the treatment of male sexual dysfunction<sup>3</sup>. However, effects of electroacupuncture on ED remain

uncertain because of the high risks of bias in previous clinical trials. In our study, although the follow-up period was relatively short, electro-acupuncture has been demonstrated to relieve ED caused by SCI. Specifically, we found (1) according to our trial, patients showed significant improvement (30.09%) of the mean value for rigidity at week 4; and (2) most importantly, the patients mean duration during nocturnal penile tumescence recordings increased from 7.02 min to 11.46 min. Huang AC<sup>[4]</sup> found that electroacupuncture stimulation of both low- and high frequencies at Guanyuan (CV4) and Zhongji (CV3) acupoints on male copulatory behavior in sexually experienced male rats. In 1999, HG Kho and his colleague<sup>[5]</sup> reported electro-acupuncture improve the quality of erection and restored the sexual activity with an overall effect of 39%. Improvements in NPTR outcomes also translated into better quality of life<sup>[6]</sup>.

No patients developed systemic or significant adverse events of treatment in this trial. A limitation of this study is that the sample size was relatively small. Therefore, further studies are warranted.

A limitation of this study is that the number of patients was relatively fewer. Therefore, further studies are warranted.

**Table 1:** Clinical outcomes at baseline and 4 weeks

Outcome	Baseline	Week 12	P Value
Number of patients	12	12	
IIEF	9.37 ± 3.61	12.51 ± 2.03	0.046
Mean value for rigidity, %	47.68 ± 10.86	62.03 ± 16.29	0.038
Mean duration during NPTR, min	7.02 ± 2.94	11.46 ± 2.06	0.042

IIEF = International Index of Erectile Function

NPTR = Nocturnal penile tumescence recordings

Values are given as mean ± standard deviation; P values from Student's t-test

### Conclusions

Our results have demonstrated that electro-acupuncture is effective and safe for SCI patients with ED.

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### Conflict of Interest Statement

The authors declare no conflict of interest.

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