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CLINICAL STUDY

Traditional Chinese Medicine comprehensive therapy for the improvement of motor function in spinal cord injury patients

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Abstract

OBJECTIVE: To study the effect of early comprehensive therapy of Traditional Chinese Medicine (TCM) on motor function of in patients with spinal cord injury.

METHODS: Fifty-one standard spinal cord injury patients with paraplegia were randomly assigned to an experimental or control group. The experimental group received TCM comprehensive therapy, and the control group received modern Western Medicine (WM) treatment for 4 weeks. The motor score (MS), Barthel Index (BI) and American Spinal Injury Association (ASIA) grading were measured in both groups before and after treatment.

RESULTS: After treatment, the MS and BI scores of the TCM comprehensive therapy group improved significantly ($P < 0.01$), and there was no significant difference in ASIA grading ($P > 0.05$). The differences between the experimental and control groups after treatment were not significant ($P > 0.05$).

CONCLUSION: Early TCM comprehensive therapy is an effective method for improving motor function in patients with spinal cord injury.

Key words: Spinal cord injuries; Medicine, Chinese traditional; Treatment outcome

INTRODUCTION

Spinal cord injury (SCI) has a low cure rate, a high disability rate and its incidence is on the rise[1]. Such injuries can lead to severe impairments of motor, sensory, and autonomic function. Motor disorder is particularly difficult for individuals as well as their families and can result in a heavy social burden. Consequently, new therapies are needed to maximize the recovery from impaired motor function to improve the patients' quality of life and restore their ability to work.

Modern Western Medicine (WM) occupies the dominant position in prevention and treatment of SCI, and much progress has been made recently in this field[2]. However, in China, many patients with SCI are treated with one or more types of Traditional Chinese Medicine (TCM) in addition to WM an attempt to enhance the therapeutic effects of SCI treatment. Presently, more evidence is needed to show the effects of TCM on SCI recovery and assess its degree of effectiveness. In this study, we aimed to establish the clinical efficacy of comprehensive TCM on motor function in patients with early phase SCI.

MATERIALS AND METHODS

Patients

Fifty-four patients with early stage SCI were selected at the Department of Rehabilitation at the Affiliated Hospital of Jining Medical University, from December 2011 to April 2014. Patients were randomly divided into a TCM treatment group (n = 27; given TCM treatment) and a WM treatment group (n = 27; given WM treatment). Computer-generated randomized numbers were used to divide subjects, and the allocation codes were kept in opaque envelopes.

Diagnostic criteria

International standards for neurological classification of spinal cord injury (revised 2011), published by the American Spinal Injury Association (ASIA), were referenced in diagnosing paraplegia. Paraplegia refers to impairment or loss of motor and/or sensory function in the thoracic, lumbar or sacral (but not cervical) segments of the spinal cord, secondary to damage of neural elements within the spinal canal. With paraplegia, arm functioning is spared, but, depending on the level of injury, the trunk, legs and pelvic organs may be involved.[3]

Inclusion criteria

To be eligible, participants were required to meet the following conditions: diagnosis in line with TCM theory for flaccidity, convulsion, paralysis syndrome; past medical history, imaging or surgical exploration confirming thoracic, lumbar or sacral spinal cord injury; stage of SCI was within 1 month of onset, and vital signs were stable; age of 18-60 years; and conscious and active cooperation with treatment. The patient or legal guardian voluntarily signed the informed consent to participate in the study. The degree of impairment was determined according to the ASIA impairment scale and ranged from A to D. On this scale, A = complete, meaning no sensory or motor function is preserved in the sacral segments S4-S5; B = sensory incomplete, indicating that sensory but not motor function is preserved below the neurological level and includes the sacral segments S4-S5, and no motor function is preserved more than three levels below the motor level on either side of the body; C = motor incomplete, wherein motor function is preserved below the neurological level, and more than half of key muscle functions below the single neurological level of injury have a muscle grade less than 3 (Grades 0-2); D = motor incomplete, indicating that motor function is preserved below the neurological level, and at least half (half or more) of key muscle functions below the neurological level of injury have a muscle grade > 3; and E = Normal.

Exclusion criteria

Participants with the following conditions were excluded: serious heart, liver, kidney, hematopoietic system, or endocrine system-related diseases, or blood coagulation dysfunction, severe mental disorders or dementia; pregnant or breast-feeding; general allergies, or allergies to Chinese herbal medicine ingredients; and/or participation in other clinical trials within the past 3 months.

Criteria for withdrawal from the study

Withdrawal from the study occurred when participants: requested to withdraw; suffered serious adverse events or deterioration, or needed to take emergency, compensatory medical measures during the trial; failed to comply with treatment programs; or had incomplete assessment data or records. The ethics committees of the Affiliated Hospital of Jining Medial University approved the study. The purpose, nature and potential risks of the experiments were explained to the patients and their families and all participants gave written, informed consent before participating in the study.

Interventions

Patients in both the TCM treatment group (experimental) and the WM treatment group (control) received all necessary Western medical treatment, including: life support, surgery, medication, standard care and health education. Two interventions were conducted for 4 weeks of treatment using the following methods. The WM intervention group received modern Western rehabilitation care, including physiotherapy and occupational therapy to conduct functional training involving standing bed training, muscle strength training, range of motion training, stretching, balance exercises for sitting and standing, ambulation training for those who had potential for walking, walking tools training and activity of daily living skills training. The modes, intensities, durations, and frequencies of the training program were tailored to the individual based on the degree of dysfunction. The TCM group received several types of TCM treatment methods including acupuncture, moxibustion, massage, Chinese herbs and TCM health education in addition to the necessary Western medicines. All TCM methods were used unless individual contraindications or lack of need was evident. The specific methods are detailed below.

Body acupuncture (the affected side): Acupuncture points were at the neurological level of injury and upper and lower two vertebral spaces on the governing vessel or Huatuo Jiaji points (EX-B 2) which are located 0.5 cun lateral of the paravertebral space on the back. In the lower limb we selected acupuncture points on the muscles antagonistic to muscles of spasm to avoid acupuncture aggravated spasms. To treat extensor spasms in the lower limb we selected Yinmen (BL 37), Weiyang (BL 39), Weizhong (BL 40), Heyang (BL 55), Chengjin (BL 56). Flexor spasms in the lower limb were treated with Futu (ST 32), Yinshi (ST 33), Liangqiu (ST 34), Zusanli (ST 36), Fenglong (ST 40). Foot drop was treated with Jiexi (ST 41), Chongyang (ST 42), Xiangu (ST 43), Qiuxu (GB 40). If muscle spasms were not present we selected acupoints on the