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RESEARCH ARTICLE

Efficacies of Acupuncture and Anti-inflammatory Treatment for Carpal Tunnel Syndrome



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Abstract

This study compared the efficacies of acupuncture and anti-inflammatory treatment in patients with carpal tunnel syndrome (CTS). Fifty patients with mild to moderate CTS were randomly divided into two groups. Both groups received night wrist splints as the standard conservative treatment for 1 month. The acupuncture group also received eight sessions of acupuncture therapy (twice a week for 4 weeks). The control group received 400 mg of ibuprofen three times a day for 10 days. The visual analog scale (VAS) score, the score on the Boston Carpal Tunnel Questionnaire for Functional Status and Symptom Severity (BCTQ FUNCT and SYMPT), and the electrodiagnostic findings were evaluated at baseline and 1 month after treatment. At the final follow up, significant improvements were found in both groups ($p < 0.05$). Statistically significant improvements were observed in the VAS score, the score on the global BCTQ FUNCT and SYMPT, and the electrodiagnostic findings, but not in the distal motor latency (DML), in the acupuncture group ($p < 0.05$). Our findings indicate that acupuncture affected the score on the global BCTQ FUNCT and SYMPT, the VAS score, and the electrodiagnostic findings, except the DML, more than ibuprofen did and that acupuncture might be an effective treatment for CTS.

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1. Introduction

Carpal tunnel syndrome (CTS) is the most common peripheral nerve entrapment that compresses the median nerve within the carpal tunnel in the wrist. The classic symptoms of CTS are numbness, paresthesia, tingling in the radial three and half fingers, and awakening at night with numbness or pain in the fingers. In rare cases, patients also report cold hands, dry skin, or changes in sweating hands that seem to be related to the involvement of autonomic fibers. In the later stages of CTS, numbness may stabilize and motor impairment becomes more apparent and the patient complains of weakness and may report dropping objects.

Different clinical tests such as Tinel sign, Phalen test, and carpal tunnel compression are helpful in diagnosing this syndrome. To confirm the diagnosis, electrodiagnostic study is used. The electrodiagnostic study is the most sensitive method of diagnosis and grading of the severity of this syndrome and the evaluation of other problems. Imaging studies are rarely used in cases that do not respond to conservative treatment or have normal findings in nerve conduction studies.

Starting treatment in the early stages of CTS before the damage progresses is very important. First-line therapy is a conservative treatment for patients who do not have any evidence of denervation in electromyography, cannot undergo surgery, or have nonconstant symptoms of mild to moderate CTS [1]. According to the Work-Related Carpal Tunnel Syndrome Diagnosis and Treatment Guideline, conservative treatments include wrist splinting, local steroid injection, and forearm/wrist stretching home exercise regimens. Surgery is recommended if conservative management does not lead to sustainable functional improvement within 6–8 weeks [2].

Recently, acupuncture has received special attention for the management of pain. The efficacy of acupuncture for the treatment of CTS has been investigated in some studies [3–5].

A recent randomized controlled trial study compared the efficacy of acupuncture with night splinting for the treatment of CTS and showed that electroacupuncture was as effective as night splinting in the management of symptoms in patients with mild to moderate CTS [6]. Another recent randomized trial study with long-term follow up (13 months) compared the efficiency of acupuncture with oral steroids for the treatment of CTS. Although both groups showed more than 48.5% improvement in global symptom scale at Months 7 and 13, the patients who received acupuncture had significantly better improvement in distal motor latency (DML), distal sensory latency (DSL), and global symptom scale compared with those in the steroid group. The results of this study showed greater efficacy in the acupuncture group in both symptom scores and nerve conduction parameters [7].

By contrast, some studies did not approve the benefit of acupuncture in relieving symptoms when compared with the placebo or control group. For example, in a systematic review of randomized controlled trials in Korea in 2010, the effectiveness of acupuncture was assessed in the management of CTS and found that the existing evidence is not

convincing enough to suggest that acupuncture is an effective treatment for CTS [8]. In another study, Weinstein et al [9] assessed the effect of manual acupuncture versus sham acupuncture and found no statistical difference between the two groups.

Although the National Institutes of Health confirmed that acupuncture may be useful as an adjunct treatment or an acceptable alternative or be included in a comprehensive management program for patients with CTS [10], there is still controversy surrounding the benefits of acupuncture [11,12]. The aim of this study was to investigate the efficacy of short-term acupuncture and compression with anti-inflammatory treatment approaches in mild to moderate CTS.

2. Materials and methods

This study was a randomized trial study undertaken in physical medicine and rehabilitation outpatient clinics in various hospitals in Shiraz, Iran. The Ethics Committee of Shiraz University of Medical Sciences approved the study prior to commencement. Diagnosis of patients was made based on the history and physical examination results in accordance with standard electrophysiological criteria. According to similar studies and considering the $\alpha = 0.05$ and $\beta = 0.2$ with power = 80%, the sample size was calculated using the software *Power SCC* and included 25 patients (hands) in each group. This study was performed on 50 patients (25 patients in 2 groups; age range, 18–75 years) with electrophysiologically confirmed mild to moderate CTS.

In this study, mild CTS was attributed to patients with prolonged DSL (≥ 3.6 milliseconds). Moderate CTS was attributed to patients with prolonged DML (≥ 4.2 months). Exclusion criteria were as follows:

- *Severe CTS*: Thenar muscle atrophy or the presence of denervation potentials on needle electromyography in the abductor pollicis brevis or absence of sensory nerve action potential.
- Clinical and electrophysiological findings of associated conditions that could mimic CTS such as proximal median neuropathy, cervical root involvement, or significant polyneuropathy.
- Evidence of underlying disorders such as diabetes mellitus, rheumatoid arthritis, hypothyroidism, pregnancy and trauma, suspected malignancy, and autoimmune or inflammatory disease.
- Patients who have contraindications for taking ibuprofen.
- Any patient who had contraindication for needling, such as bleeding tendency, local infection, severe needling phobia, or a history of needling shock.

After selecting patients based on the inclusion and exclusion criteria of the study, providing the necessary information to the patients about the benefits and side effects of the study, and obtaining consent from patients for the study, we randomly divided the study patients into two groups. For randomization, we used a block randomization

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