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Effects of Traditional Cupping Therapy in Patients With Carpal Tunnel Syndrome: A Randomized Controlled Trial

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Abstract: We investigated the effectiveness of cupping, a traditional method of treating musculoskeletal pain, in patients with carpal tunnel syndrome (CTS) in an open randomized trial. n = 52 outpatients (58.5 ± 8.0 years) with neurologically confirmed CTS were randomly assigned to either a verum (n = 26) or a control group (n = 26). Verum patients were treated with a single application of wet cupping, and control patients with a single local application of heat within the region overlying the trapezius muscle. Patients were followed up on day 7 after treatment. The primary outcome, severity of CTS symptoms (VAS), was reduced from 61.5 ± 20.5 to 24.6 ± 22.7mm at day 7 in the cupping group and from 67.1 ± 20.2 to 51.7 ± 23.9mm in the control group [group difference –24.5mm (95%CI –36.1; –2.9, *P* < .001)]. Significant treatment effects were also found for the Levine CTS-score (–.6 pts: 95%CI –.9; -.2, *P* = .002), neck pain (-12.6mm; 95%CI −18.8; −6.4, *P* < .001), functional disability (DASH-Score) (–11.1 pts; 95%CI –17.1; –5.1, *P* < .001), and physical quality of life (.3; 95%CI .0; .3, *P* = .048). The treatment was safe and well tolerated. We conclude that cupping therapy may be effective in relieving the pain and other symptoms related to CTS. The efficacy of cupping in the long-term management of CTS and related mechanisms remains to be clarified.

***Perspective:** The results of a randomized trial on the clinical effects of traditional cupping therapy in patients with carpal tunnel syndrome are presented. Cupping of segmentally related shoulder zones appears to alleviate the symptoms of carpal tunnel syndrome.*

***Key words:** Carpal tunnel syndrome, complementary medicine, cupping, double crush syndrome, randomized trial, treatment.*

Carpal tunnel syndrome (CTS) is a common disorder with an estimated prevalence of 2.7% (clinically and electrophysiologically confirmed) in the general population.[1] Women are more frequently affected than men.[14] CTS causes significant morbidity[2] and has, in addition to its potentially debilitating physical aspects, a negative financial impact resulting from time lost from work and increased medical expenses.[4] Classic symptoms of CTS include numbness, tingling, burning, and pain in at least 2 of the 3 digits supplied by the median nerve (ie, thumb, index finger, and middle finger). These symptoms are highly prevalent (14.4%) in the general population.[1]

CTS results from entrapment of the median nerve in the carpal tunnel of the wrist,[3] pathologically the consequence of noninflammatory fibrosis of the subsynovial connective tissue surrounding the flexor tendons. Biochemical studies of surgical specimens suggest that a variety of regulatory molecules may induce the fibrous and vascular proliferation, possibly as a response to mechanical stress.[5] But CTS is also related to systemic factors such as metabolic and endocrine disorders, obesity, and amyloid degeneration.[6,14] Most cases of CTS have no readily

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identifiable cause (idiopathic CTS). Whether more proximal disorders, ie, cervical radiculopathies or musculoskeletal pain syndromes affecting referred, or segmentally related, zones, can predispose to injury at sites distal to their lesions and thus be involved in the pathogenesis of CTS as proposed by the double crush hypothesis[13,30,35] remains controversial.

Standard treatment of CTS in the past has included wrist splints, oral anti-inflammatory agents, avoidance of occupational duties, locally injected corticosteroids, and surgery. However, symptomatic relief with conservative treatments has been less than satisfactory, [23,26,28] and surgical decompression, often considered the definitive solution, yields good results in only 75% of cases.[7] Since the standard treatments for CTS are not fully satisfactory, other conservative methods, including those from traditional and complementary medicine, need to be further evaluated.

Cupping of the skin and subcutaneous tissue is a traditional and widely used healing method in various countries and regions, eg, in China, India, Arabia, Central Europe, and parts of Africa.[8] The cupping of defined zones of the shoulder triangle segmentally related to the median nerve to treat CPS has been practiced in European folk medicine and is supported by recent research. In a cross-sectional study, typical alterations of the connective tissue such as painful hardening of the subcutis, adhesion or swelling of subcutaneous tissue and fascia, and reduced microcirculation in the shoulder triangle, were found to be associated with the severity of CTS symptoms.[29] Since a preliminary clinical trial has shown that wet cupping of this region is superior to no treatment in relieving the symptoms of CTS at day 7 after treatment,[21] we devised a randomized trial to assess the short-term effectiveness of wet cupping of referred zones of the shoulder by comparing it with that of a control treatment in patients with symptomatic CTS.

Methods

This study was designed as a randomized, controlled open trial. All study participants gave their informed consent. The study protocol was reviewed and approved by the Ethics Committee of the Medical Faculty, University of Duisburg-Essen, Germany. Patients were screened and recruited between July and November 2005. Treatments and follow-ups of the patients were completed by January 2006. All study procedures and the collection of data were carried out at the outpatient department of the Kliniken Essen-Mitte, an academic teaching hospital of the University of Duisburg-Essen, Germany.

Study Procedures

We recruited participants by means of a press release. Potential participants were screened for eligibility by telephone interview, and eligible candidates were scheduled for enrollment visits. A study physician performed the candidates' physical examinations, and each candidate filled out a questionnaire. Thereafter, each participant was randomly assigned to either the wet cupping or the local thermal therapy group, and the respective treatment started. All measurements were repeated on day 7 after the allocated treatment.

Study Participants

Patients of both sexes were eligible if they were between 18 and 70 years old and suffered from manifest CTS as confirmed by neurological examination and electroneurography. Only patients who had connective tissue alterations in a predefined zone at the shoulder triangle overlying the trapezius muscle were included. Connective tissue was defined as altered if the consistency of the subcutis was hardened and folds of skin could not be lifted from the fascia without tissue resistance and some discomfort.

Patients were excluded if they were receiving anticoagulants or had hemophilia, anemia, polyneuropathy, or a coexisting serious illness. We also excluded patients if they were participating in another study, had undergone previous surgery for CTS, or had had intra-articular injections within the previous 3 months. Patients regularly taking NSAIDs or analgesics as rescue medication were not excluded if the mean weekly dosage and type of administration had not been altered during the preceding 3 months.

Randomization

Patients were randomly allocated to the 2 treatments by a nonstratified block-randomization with various block lengths and by preparing sealed, sequentially numbered opaque envelopes containing the treatment assignments. Randomization and the envelopes were prepared by the study biostatistician. When a patient fulfilled all enrollment criteria, the study physician opened the lowest-numbered envelope to reveal that patient's assignment.

Interventions

Cupping

There are 2 main types of cupping: dry and wet cupping. While dry cupping simply involves stimulation of the skin by suction, wet cupping includes some scarification of the skin before applying the cupping glasses. A partial vacuum can be produced by electromechanical or manual suction or by heat production within the cupping glass after it is applied to the skin. Mechanical suction was preferred in this study to avoid burning the skin. The protocol for performing cupping was as follows: The skin overlying the trapezius muscle was disinfected; scarification (puncturing) of the skin was carried out by repeatedly puncturing it superficially with sterile 20-gauge microlancets (number of incisions: 5 to 10); the vacuum cups (size 75 and 100 ccm) were applied and the air within the cup was rarefied by manual mechanical suction; the cupping glasses were removed after 5 to 10 minutes (or when they became partially