ACUPUNCTURE MAY HAVE HIGHER TREATMENT RESPONSE RATE THAN STEROID INJECTION FOR CARPAL TUNNEL SYNDROME

Level 2 (mid-level) evidence


Carpal tunnel syndrome (CTS) is caused by compression of the median nerve at the level of the wrist. The typical list of symptoms may include numbness, tingling, hand pain, and muscular dysfunction. Acupuncture has been recommended as a symptomatic treatment modality, but its effectiveness is not well evidenced.

In the first published systematic review of acupuncture and acupuncture-like treatments for CTS, six randomized trials were evaluated involving 442 patients (mean sample size 74). Five trials examined needle acupuncture for 416 CTS patients and one trial evaluated laser acupuncture in 26 CTS patients. Duration of CTS ranged from 1 to 84 months. Duration of the treatment was 2.8 to 6 weeks. Outcome measures included nerve conduction studies, symptom severity scale, global symptom score, and responder rate. Five of the trials conducted baseline comparisons.

Researchers found that acupuncture was associated with a higher response rate than steroid injection in a meta-analysis of two trials with 144 patients (risk ratio 1.28; 95% confidence interval [CI] 1.08-1.52). Assuming a 72% response rate with steroid injection, one more patient would respond for every five patients treated with acupuncture instead of steroid injection (number needed to treat [NNT] 5, 95% CI 3-18). A specialized form of acupuncture (pricking collateral blood therapy) together with tuina (Chinese massage) was associated with improved median nerve conduction velocity compared with tuina alone in one trial with 60 patients.

On the other hand, there were no significant differences in symptoms comparing:

- real laser acupuncture to sham laser acupuncture in one trial with 26 patients
- manual acupuncture to sham acupuncture in one trial with 140 patients
- manual acupuncture to oral steroids in one trial with 77 patients

The last trial comparing acupuncture with oral steroids bears further discussion. A four-week regimen of oral prednisolone (20 mg daily for two weeks then 10 mg daily for two weeks) was compared to a four-week manual acupuncture regimen (eight sessions) in a randomized trial without blinding. Both groups showed improved symptoms at four weeks, but no significant differences between groups in pain, numbness, paresthesia, and weakness were shown. However, at four weeks, acupuncture was associated with a significantly greater reduction in nocturnal awakening ($P = .03$) and distal motor latency ($P = .012$). At both 7 and 13 months, the acupuncture group experienced significantly fewer treatment failures and significantly higher rates of “good improvement” compared to the prednisolone group.

Overall, the evidence for acupuncture for CTS appears mixed. Acupuncture appears as or more effective than steroids (orally or by local injection), but acupuncture may be no more effective than sham acupuncture. One explanation for this discrepancy is a lack of standardization across acupuncture treatment protocols. However, despite this shortcoming common to many acupuncture trials, these studies hint at a possible role for a trial of acupuncture in interested patients or in those whose symptoms do not respond well to standard medical management.

COMBINED CHIROPRACTIC INTERVENTIONS (INCLUDING SPINAL MANIPULATION) ASSOCIATED WITH SMALL SHORT-TERM REDUCTIONS IN PAIN IN ACUTE BUT NOT CHRONIC LOW BACK PAIN

Level 2 (midlevel) evidence

Reference: Cochrane Database Syst Rev 2010;4:CD005427

The lifetime prevalence of low back pain (LBP) in the United States is reported to range from 11% to 84%. For the vast majority of those presenting with acute low-back pain, the cause of pain is nonspecific, with a more serious underlying condition being rare. Although nonspecific acute LBP is generally a self-limited condition, patients who go on to develop chronic LBP can experience years of suffering and disability, which often re-
sponds poorly to standard medical or surgical management. Many patients seeing chiropractors for LBP receive multiple services in addition to the mainstay of chiropractic care: spinal manipulative therapy (SMT). In a Cochrane review, researchers used the term combined chiropractic interventions to describe this common multimodal approach. In the studies included in their review, SMT was combined with one or more of the following therapies: massage, thermotherapies, electrotherapies, use of mechanical devices, exercise programs, nutritional advice, orthotics, lifestyle modification, and/or patient education.

The systematic review found 12 randomized trials, involving 2887 patients with acute, subacute, or chronic low back pain, which compared the use of combined chiropractic interventions to a variety of other therapies. These comparator interventions included physiotherapy, ultrasound, massage, heat or cold application, education, medications, injections, electrotherapies, and others. In patients with acute or subacute LBP, combined chiropractic interventions was associated with:

- reduced pain at less than one month ($P < .05$) in an analysis of three trials with 423 patients
- reduced pain at 12 weeks ($P = .014$) in one trial with 230 patients
- reduced disability at less than one month ($P < .05$) in an analysis of four trials with 545 patients
- reduced disability at 12 weeks ($P = .044$) in one trial with 298 patients.

For acute or subacute LBP, effect sizes were small and all of the studies had substantial methodologic problems introducing bias. In patients with chronic low back pain, there were no significant differences in pain, disability, or general health status at any point in time in analyses of three trials with 388 patients.

Other systematic reviews of chiropractic interventions have focused primarily on SMT and did not include the full range of interventions delivered by chiropractors. Although the results of the current review cannot provide us with useful information regarding the relative value of individual chiropractic techniques (e.g., SMT vs. exercise), these sorts of pragmatic studies are more consistent with the actual experience of patients receiving chiropractic care. Although there did appear to be an advantage of combined chiropractic care for short- and medium-term LBP, the high risk of bias and small effect sizes suggest that these differences are unlikely to be clinically relevant. Given the difficulty of designing adequate placebos for chiropractic and other manual therapies, more and better designed pragmatic trials are needed to further define the role of chiropractic care in the management of low back pain of any duration.

**EXERCISE THERAPY OR COGNITIVE BEHAVIORAL THERAPY IMPROVES FATIGUE AND PHYSICAL FUNCTIONING IN PATIENTS WITH CHRONIC FATIGUE SYNDROME**

*Level 1 (likely reliable) evidence*

Reference: Lancet 2011;377:823

Chronic fatigue syndrome is a potentially incapacitating illness that is often difficult to treat. Nonpharmacologic strategies include graded exercise, cognitive-behavioral therapy, and adaptive pacing. The PACE (Pacing, Activity and Cognitive Behavioral Therapy: A Randomized Evaluation) trial randomized 641 adults receiving specialized medical care for chronic fatigue syndrome to 24 weeks of one of four treatment groups: graded exercise therapy versus cognitive behavioral therapy (CBT) versus adaptive pacing therapy versus no additional therapy (specialized medical care alone). Patients were followed for one year. Doctors provided specialized medical care in at least three sessions, which included information, advice, and medication for symptoms. Graded exercise therapy included incremental increases in duration, followed by gradual increases in intensity and aerobic nature of the exercise. Adaptive pacing therapy employed strategies for optimizing adaptation to illness via planning, pacing, prioritizing activity and promoting natural recovery. Patients in the three additional therapy groups attended 12 to 15 sessions.

Primary outcomes were self-reported assessments of fatigue (Chalder fatigue questionnaire) and physical function (short-form 36 physical function subscale). Clinically meaningful improvement in both fatigue and function scores were achieved by 61% of participants in the graded exercise group and 59% in the CBT group, compared to 42% of subjects in the adaptive pacing group and 45% in the specialized care only group. Compared to specialized care only, the NNT was 7 for graded exercise ($P = .004$) and 8 for CBT ($P = .015$). Addition of adaptive pacing therapy to specialist medical care did not result in significant differences in fatigue and physical function.

Advocates for sufferers of chronic fatigue syndrome have long stressed the value of adapting to the condition by learning to pace one’s activities. This trial demonstrates the advantages of the alternative philosophy underlying graded exercise and cognitive behavioral therapies, which encourages patients to (sensibly) push past their perceived limitations. Contrasting cognitive orientations is one theoretical explanation for this finding. In adaptive pacing therapy, patients are advised to focus on how fatigued they are feeling at any given moment and to adjust their activity accordingly. Conversely, graded exercise and cognitive behavioral approaches begin with the premise that recovery is possible and asks patients to focus on what lies beyond their fatigue rather than accepting its inevitability.

L-ARGININE PLUS ANTIOXIDANT SUPPLEMENTATION DURING PREGNANCY REDUCES RISK OF PREECLAMPSIA IN HIGH-RISK WOMEN

*Level 1 (likely reliable) evidence*

Reference: BMJ 2011;342:d2901

Untreated pregnancy-induced hypertension can lead to considerable maternal and neonatal morbidity and mortality. In addition to close monitoring throughout their pregnancies, current recommendations for reducing the risk of preeclampsia in high-risk women include low-dose aspirin, calcium supplementation, and increased rest during the third trimester. The amino acid L-arginine is a substrate for nitric oxide synthase in endothelial cells. Given the observation that nitric oxide deficiency during pregnancy contributes to the vasoconstrictive pathophysiology of hypertension, researchers decided to investigate the preventive effects of supplemental L-arginine for eclampsia and preeclampsia.

In a randomized trial, 672 pregnant women at high risk of preeclampsia were divided into three groups starting at 14 to
32 weeks gestation: supplementation with a medical food bar containing L-arginine (6.6 g) plus antioxidant vitamins (500 g vitamin C and 400 IU vitamin E) versus antioxidant vitamins alone versus placebo. Participants were followed until delivery. Preeclampsia or eclampsia occurred in 30% with placebo, 23% with antioxidants alone (P = .052 vs placebo), and 13% with L-arginine plus antioxidants (P < .001 vs placebo, NNT 6; P = .004 vs antioxidants alone, NNT 10). Preterm delivery occurred in 20% with placebo, 23% with antioxidants alone, and 11% with L-arginine plus antioxidants (P = .003 vs placebo, NNT 11; P < .001 vs antioxidants alone, NNT 9). There were no significant differences among groups in rates of spontaneous preterm delivery or Cesarean delivery.

Antioxidant supplementation (concomitant vitamin C and vitamin E supplementation) for prevention of preeclampsia has been tried in nine randomized trials and shown to be not only ineffective but to increase the risk for premature rupture of membranes. Nevertheless, researchers in this study elected to include antioxidant supplementation based on the theory that endothelial damage caused by reactive oxygen species contributes to preeclampsia. The results of this trial suggest that, although antioxidants alone are insufficient to overcome the endothelial dysfunction contributing to preeclampsia, the dual mechanism provided by the addition of L-arginine (and its presumptive promotion of nitrous oxide production) may be enough to tip the balance in the direction of normal endothelial function. This would be particularly true in pregnant women who may be deficient in this amino acid.

“BLAST FROM THE PAST”
PREVENTION OF COMPLEX REGIONAL PAIN SYNDROME AFTER WRIST FRACTURE
Level 1 (likely reliable) evidence

One of the most dreaded long-term complications of any significant trauma is the chronic pain and severe debilitation caused by complex regional pain syndrome (CRPS). Because CRPS is notoriously difficult to treat, prevention should be considered the ideal goal. Preventive management is largely limited to early and effective analgesia following injury. To the extent that CRPS is associated with an exaggerated inflammatory reaction, it is plausible that the antioxidative effect of supplemental vitamin C administered soon after a predisposing injury could prevent its development. Based on two randomized trials by the same authors, vitamin C is shown to reduce the risk of complex regional pain syndrome after wrist fracture.

Vitamin C at doses of 500 mg daily for 50 days decreased rates of CRPS compared to placebo (1.8% vs 10.1%, NNT 12) in one trial with 416 mostly elderly female patients who had sustained 427 wrist fractures.7 In a previous trial involving 123 adults with 127 conservatively treated wrist fractures, vitamin C 500 mg once daily for 50 days was associated with a reduced rate of CRPS at one-year follow-up (7% vs 22%, NNT 7).8 Although a 500-mg dose of vitamin C for 50 days seems harmless, high vitamin C intake (>1000 mg daily) has been associated with increased risk for kidney stones in patients predisposed to calcium stone formation among other complications.

Given the controversial “cure-all” reputation vitamin C has endured over these many years, it is certainly understandable to greet any claim of benefit in nutritionally replete patients with considerable skepticism. Although such misgivings are reasonable, these two trials remind us that it is always sensible to question what you think you already know.

This evidence also encourages us to reflect on the importance of information support during practice. Is this the first time you have read about vitamin C preventing CRPS? If you, your friend, your family, or your patient suffers a wrist fracture would you now recommend low-dose vitamin C to prevent a serious complication? If you did not read this how would you know at the time of treating a wrist fracture?

REFERENCES

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