**Madenci E, Altindag O, Koca I, and et al. Reliability and efficacy of the new massage technique on the treatment in the patients with carpal tunnel syndrome.** **Rheumatol Int 2012; 32:3171–3179.**

**PMID:** **21953301**

**Reviewer:** Linda Metzger 12-29-15

**Design:** Randomized controlled trial

**Objective:** To evaluate the effects of 6 weeks of self-administered hand massage therapy and wearing a night hand splint for 6 months compared to wearing a night hand splint for 6 months only on pain and grip strength in patients with carpal tunnel syndrome (CTS).

**Summary of Results:**

* The results of this study demonstrated that pain significantly decreased and grip strength significantly increased in both treatment groups, and these beneficial effects were significantly improved in the hand massage group compared to the splint only group.

**Reasons not to cite as evidence:**

* The designation of a primary outcome was not clear. Several outcome measures were reported including the Patient Global Assessment (PGA), the Physician Global Assessment (MDPGA), hand grip strength, Electroneurophysiological examinations for the left and right hands; mMDL, mMNCV, and mSNCV, and the Boston symptom severity scale and the functional capacity scale.
* All 6 of the electroneurophysiological outcomes measured were not significant and showed no difference between the groups. The other 5 outcomes showed small, but statistically significant between group differences in favor of the massage group. Basing the conclusions of the study on just the positive outcomes is selective outcome reporting.
* After the treatment, statistically significant improvement was observed in 3 of the 6 electrophysiological parameters only in the massage group, but all between group differences were not significant. The authors reported only the positive outcomes in the conclusions, indicating selective outcome reporting again.
* Simple randomization was performed by a different physician according to the hospital admission order of the patients. This method of randomization in which allocation is not truly concealed can introduce a high risk of bias. This methodological concern signifies a failure of allocation concealment. Since the conclusions could be subject to this bias, our confidence in the conclusions is weakened.
* The author failed to report if the assessors who performed the outcome measurements (MDPGA, hand grip strength, electroneurophysiological examinations) were blinded to the treatment groups and the study’s hypothesis. This would leave the outcome measurements at a high risk of bias.
* Even though 4 patients were excluded from the study because of poor compliance, reporting on methods of compliance and evaluation of compliance results was missing. Non-compliance would tend to underestimate the size of the effect and could have contributed to the non-significant results and small significant results.
* The patients in the massage group were taught the hand massage therapy on the first day of their therapy from an experienced physical therapy and rehabilitation physician. The patients in only the massage group attended 6 weekly follow-up visits and were asked to do the massage themselves under physician supervision. The additional practice and attention during these visits could have contributed to the significant outcomes on some of the outcome measures resulting in performance bias.
* The author reported that 6 weeks of either splint only or massage therapy plus splint was effective in improving hand grip strength in both groups. This result was based solely on statistical significance. A MCID for grip strength has not been formally established, but would be useful for evaluating the effectiveness of new treatments. Kim (2014) suggested a MCID for grip strength of 6.5 kg or a 19.5% difference one year after surgery for a distal radial fracture. Lang (2008) suggested a MCID of 5.0 and 6.2kg for the affected dominant and non-dominant sides in stroke patients. In the massage group, grip strength improved by 4.9 (right) and 5.7 kg (left), and in the splint only group, grip strength improved by 2.5 (right) and 3.6 kg (left). In this study, the improvements in grip strength in both groups in both hands were smaller than any suggested MCIDs, and thus may not be clinically significant. The difference observed between the 2 groups in grip strength was also statistically significant post-treatment in favor of the massage group, but may not have been clinically significant. The between group differences of 2.1(right) and 2.8 kg (left) could easily have been due to chance alone or measurement error.
* A major limitation of the study was that it violated the assumption of independent observations for the Student T test which was used for data analysis. The observations in this study lack independence from one another, since most (142) of the 151 symptomatic hands analyzed in this study came from patients with bilateral CTS. For observations to be independent, they must come from different individuals. Non-independent observations can make the results of the Student T Test incorrect or misleading, or simply give too many false positives. Because the conclusions from this study are suspect for violating the assumptions of the statistical test, the conclusions are rejected.
* There were too many issues to make any evidence recommendations and the author’s conclusions were also too weak for evidence. This may in fact be a good non-invasive, cheap, and easily applicable treatment option with high patient compliance, but one can’t determine that from this study.
* Based on only this one study, there is lack of supporting evidence from any other studies to make a definitive statement that 6 weeks of self-administered hand massage therapy and wearing a night hand splint for 6 months is more effective in improving grip strength and decreasing pain in patients with carpal tunnel syndrome than only wearing a night hand splint for 6 months.

**Assessment:**

* Inadequate for evidence of the effect of 6 weeks of self-administered hand massage therapy and wearing a night hand splint for 6 months in patients with carpal tunnel syndrome on pain and grip strength.

**References:**

* Kim JK, Park MG, and Shin SJ. What is the clinically important difference in grip strength? *Clin Orthop Relat Res (2014) 472:2536–2541.*
* Lang, C. E., Edwards, D. F., et al. (2008). Estimating minimal clinically important differences of upper-extremity measures early after stroke. *Arch Phys Med Rehabil 89(9): 1693-1700.*