

Traditional Korean Medicine Therapy for Treating Carpal Tunnel Syndrome in Patients with Wrist Pain: A Systematic Review[※]

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[Abstract]

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Objectives : This study aims to evaluate current clinical evidence of traditional Korean medicine treatment on wrist pain with carpal tunnel syndrome.

Methods : Ten Korean databases were searched for prospective clinical trials of traditional Korean medicine therapy on wrist pain with carpal tunnel syndrome from the time of their inception to February, 2015. Studies conducted in Korean, Chinese and English were searched. Risk of bias in included non-randomized controlled trials was assessed by the Cochrane handbook procedure.

Results : Four non-randomized controlled trials were included. A high risk of bias was observed in all trials. All of the included studies reported favorable effects being experienced by an intervention group compared to a baseline or control group. Included studies never described any occurrence of adverse events.

Conclusions : There is no evidence that traditional Korean medicine treatments are effective for treating wrist pain associated with carpal tunnel syndrome. All of the included studies lacked appropriate methodological qualities and internal validity. Future well-designed clinical trials that evaluate the effects and safety of traditional Korean medicine treatment for patients with carpal tunnel syndrome are needed.

Key words :

Carpal tunnel syndrome;
 Wrist pain;
 Traditional Korean medicine treatment;
 Pharmacopuncture;
 A systematic review

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I. Introduction

Carpal tunnel syndrome is a cluster of pain, numbness and muscular atrophy due to the compression of median nerve at wrist joint¹⁾. It was first introduced by James Paget of secondary median nerve compression after traumatic onset in 1854²⁾.

Carpal tunnel syndrome is relatively common disease with 1 % prevalence of general population and occurs commonly in older ages³⁾. Women have double frequency over men in carpal tunnel syndrome and repetitive wrist movement is a possible cause of aggravation of this syndrome⁴⁾.

Carpal tunnel syndrome is mainly cause by fracture of proximal radius, trauma, neoplasm, gout, and infection⁵⁾. Phalen presented the most common cause of this syndrome as thickening or fibrosis of flexor tendons⁶⁾.

The symptoms of carpal tunnel syndrome are the pain of dermatome by median nerve, tingling sense, burning sense, and neurological numbness. The onset of symptoms is especially expressed during pertaining of flexion while flexor tendons are compressed and is occasionally aggravated during night-time⁷⁾.

Carpal tunnel syndrome is diagnosed by subjective symptoms, the positiveness of Phalen / Tinel sign, numbness of palmar area, weakness of abductor pollicis brevis and electrodiagnostic examination^{8,9)}.

The first-considered treatment of carpal tunnel syndrome is the conservative way. Splint support, oral medication, local injection of steroids, physical treatment, resting therapy, laser therapy and massage treatments could be applied. However, if there are repetitive recurrence or severe neurological symptoms, operational treatment should be considered¹⁰⁾.

Nevertheless over 70 % success rate of operational treatment in carpal tunnel syndrome is relatively high¹¹⁾, open decompressive surgery could bring about complications like weakness of hand muscles and tenderness of incisive area. Moreover, there was a report of endoscopic decompressive surgery that could cause injury of median or ulnar nerve, artery or flexor tendons¹²⁾.

Traditional Korean medicine consider the cause of clinical trial study(CTS) with numbness as blockage of qi in wrist or hand. The estimated cause of carpal tunnel syndrome is blockage of qi in wrist¹³⁾.

The strong point of Traditional Korean Medicine therapy including acupuncture and herbal medicine is non-invasive. According to former studies, there were reports that *Jakyakgamcho* decoction and *Gye-jibokryung* pill¹⁴⁾ showed significant effect on carpal tunnel syndrome. However, the efficacy has not yet been confirmed. Hence, the aim of this study is to summarize and critically evaluate the evidence for or against the effectiveness of Traditional Korean Medicine therapy as a symptomatic treatment for wrist pain in patients with carpal tunnel syndrome.

II. Methods

A. Data sources

The following databases were searched from their inception to February 2015 : MEDLINE, AMED, EMBASE, CINHALL, Seven Korean Medical Database (Korean Traditional Knowledge Portal, RISS, Korean Studies Information, DBPIA, Korea Institute of Science and Technology Information, KoreaMed, and Research Information Centre for Health Database), Chinese Medical Database(CNKI). The search terms used were “acupuncture OR pharmacopuncture OR herbal treatment” AND “carpal tunnel syndrome or wrist pain” AND “traditional Korean medicine therapy” in Korean, Chinese, and English. Reference lists of all obtained papers were searched. Additionally, reference lists of all obtained papers were searched, and our own files were manually searched as well. Hardcopies of all potentially relevant articles were obtained and read in full.

B. Study selection

All prospective clinical studies of any type of

Traditional Korean medicine therapy for carpal tunnel syndrome in patients with wrist pain were included. We excluded case studies, case series, and qualitative studies. Articles were excluded if they were concerned with simple pain (no diagnostic evidence with carpal tunnel syndrome). Trials in which one type of therapy was compared to another type and studies that failed to provide detailed results were also excluded. No language restrictions were

imposed. Hard copies of all articles were obtained and read in full.

C. Data extraction, quality and validity assessment

All articles were read by two independent reviewers, who extracted data from the articles

Table 1. Summary of Clinical Studies of Traditional Korean Medicine Therapy for Carpal Tunnel Syndrome in Patients with Wrist Pain

First author (year)	Design sample size age range or mean age(years) gender (M/F) diagnosis	Intervention grup (regimens)	Control group (regimens)	Main outcomes	Results	Adverse events
Bae(2007)	CCT 21 patients plus 19 patients 55.7 +_ 6.3 and 58.5 +_9.8 3/18 plus 4/15 clinical symptoms and EMG results	3-week treatments including over once a week- acupuncture and three times a day- herbal medicine treatments(<i>Gyejibok ryung pill</i>)(N=21)	Three times a day-acetaminophen 650 mg medication for three weeks (occasionally with local steroid injection) (N=19)	1) VAS 2) Thorough emission of pain	1) $p < 0.05$ 2) NRS	NRS
Ku(2010)	CCT 22 hands with 16 patients 57.10+ -4.15 and 56.25+ -7.52 1/9 + 1/11 Clinical symptoms and NCV results	Twice a week-Sweet BV pharmacopuncture for 4 weeks(N=10)	Twice a week - pharmacopuncture with <i>Scolopendra morsitans L.</i> for 4 weeks(N=12)	1) VAS 2) PRS	1) $p > 0.05$ 2) $p < 0.05$	NRS
Choi(2005)	CCT 10 patients 43 and 49 2/3 + 1/4 clinical symptoms	CF pharmacopuncture with acupuncture, once when patient came. Treatment is stopped when the symptom is lessened or Phalen sign is negative.	Only acupuncture, once when patient came. Treatment is stopped when the symptom is lessened or Phalen sign is negative.	1) Clinical symptoms 2) Grading with Phalen's test	1) $p < 0.05$ 2) $p < 0.05$	NRS
Lim(2005)	CCT 40 patients 32 to 76(average 49) and 33 to 67(average 49.95) 3/17 + 4/16 clinical symptoms	Both pharmacopuncture with <i>Scolopendra morsitans L.</i> and acupuncture	Only acupuncture	1) VAS 2) Thorough emission of pain	1) $p < 0.05$ 2) $p < 0.05$	NRS

CCT : case control trial, VAS : visual analog scale, NRS : numeric rating scale, PRS : pain rating scale.

according to predefined criteria (Table 1). Risk of bias was assessed using the Cochrane classification in four criteria : randomization, blinding, withdrawals and allocation concealment¹⁵⁾.

Considering that it is impossible to blind therapists to use of therapy, we assessed patient and assessor blinding separately. Disagreements were resolved by discussion between the two reviewers. There was no disagreement between the two reviewers regarding the risk of bias.

III. Results

A. Study description

Our search identified 14 potentially relevant studies of which four met our inclusion criteria. Key data of the included studies are summarized in Table 1.

B. Risk of bias

All the included trials had a high risk of bias. Furthermore, all the included trials failed to report incomplete outcome measures and allocation concealment. None of the studies described any attempt to blind the assessors, and none mentioned any adverse events.

C. Description of individual studies

Bae conducted a case control trial (CCT) assessing the effectiveness of Traditional Korean Medicine therapy on symptoms of carpal tunnel syndrome. 40 patients were divided non-randomly into two parallel groups: A group with 3-week treatments including over once a week-acupuncture and three times a day-herbal medicine treatments (*Gyejibokryung* pill) and a group with three times a day-Acetaminophen 650 mg medication for three weeks (occasionally with local steroid injection). At the end of the treatment

period, both the experimental group and the control group showed improvement in VAS score¹⁶⁾.

Ku conducted a CCT to compare the therapeutic effect of Sweet BV pharmacopuncture and pharmacopuncture with Scolopendramorsitans L. in patients with carpal tunnel syndrome. 16 patients were divided into two parallel groups and consequently 22 hands were participated in this study (one dropped out because of pruritis). Both group showed statistically significant changes in VAS and PRS¹⁷⁾.

Choi evaluated the effect of CF pharmacopuncture with acupuncture therapy on the carpal tunnel syndrome of patients with wrist pain. They allocated 10 patients into two parallel groups : CF pharmacopuncture treatments with acupuncture therapy (N=5) and acupuncture therapy without any pharmacopuncture treatment. If participants can pertain 60 seconds with Phalen's posture and go through without pain, they were stopped with treatments. The symptom grade were improved in the experimental group compared with the control¹⁸⁾.

Lim conducted a CCT to show the therapeutic effect of pharmacopuncture with Scolopendramorsitans L. in patients with carpal tunnel syndrome. Forty patients were divided into two parallel group : the experimental group was treated by both acupuncture and pharmacopuncture with Scolopendramorsitans L. and the control group was treated by only acupuncture. No pharmacopuncture treatment was given to patients with control group. Subjective symptom grade was significantly improved in patients with experimental group more than those of control groups¹⁹⁾.

IV. Discussion

A few clinical trials have tested the effects of Traditional Korean Medicine therapy for carpal tunnel syndrome in patients with wrist pain and none of them were methodologically rigorous. All the included trials showed favorable effects of Traditional Korean Medicine therapy for carpal tunnel syndrome

in patients with wrist pain. However, the number of trials, their quality, and the total sample size are too low to allow firm conclusions.

All included trials had a high risk of bias. None of them were randomized or controlled and are therefore open to selection bias and false positive results. Low-quality trials (high risk of biased trials) are more likely to overestimate the effect size^{20,21}.

None of the randomized controlled trial (RCT)s described attempts to blind patients or examiners, dropouts and withdrawals, or allocation concealment. In addition, all trials failed to report details regarding ethical agreement. Thus, the reliability of the evidence showed here is clearly limited. Unfortunately, given data are highly susceptible to bias; hence, they provide little useful information on the specific effects of Traditional Korean Medicine therapy as a therapeutic arbitration for carpal tunnel syndrome in patients with wrist pain.

It has been repeatedly noted that trials originating from China and Korea are rarely, if ever negative²².

The absence of negative results is a mostly unexplained phenomenon. Whatever the causes, it does not increase our confidence in these studies.

Due to their design (A+B versus B) all included CCTs were unable to demonstrate specific therapeutic effects²³.

It is conceivable that with such a design (A+B versus B), the experimental treatment seems effective, even if it is, in fact, a pure placebo: the non-directive effects of A are likely to generate a positive result even in the absence of specific effects of A.

A possible mechanism of using herbal medicine to relieve wrist pain with carpal tunnel syndrome, is that anti-inflammatory reaction of herbal medicine effectively blocks serial procedures done by inflammatory factors. Also stimulation with acupuncture on several points increases the circulation of qi and relieves qi-blockage. However, this theory can be established before actual effectiveness of traditional Korean medicine therapy is demonstrated. None of these theories have been confirmed as yet.

Limitations of this systematic review pertain to the potential incompleteness of the evidence reviewed.

We aimed to identify all studies on the subject. The distorting effects of publication bias and location bias on systematic reviews and meta-analysis are well documented^{24,25}.

Further limitations include the paucity and the often suboptimal quality of primary data. Additionally, all included clinical trials that reported positive results came from Korea, one of the countries that produce virtually no negative results—a fact that casts some doubt on the validity of such data²².

Comprehensively, these facts limit the conclusiveness of this systematic review.

Although the current effectiveness was thought highly of, further studies should adopt adequate methods to permit RCTs and the use of proper pilot trials to help prepare appropriate RCTs. Cohort studies are also needed to determine the longevity of treatment effects.

V. Conclusion

The evidence that traditional Korean medicine treatment is an effective way for wrist pain with carpal tunnel syndrome is inconclusive. Even though the trial data are unanimously positive, too many important caveats exist to draw firm conclusions.

VI. References

1. Omer GE. Median nerve compression at the wrist. *Hand Clin.* 1992 ; 8(2) : 317–24.
2. Shurr DG, Blair WF, Bassett G. Electromyographic changes after carpal tunnel release. *J Hand Surg [Am].* 1986 ; 11(6) : 876–80.
3. S Brent Brotzman, Robert C Manske. *Clinical orthopaedic rehabilitation: an evidence-based approach*, 3rd ed, Elsevier, 2005.
4. Evermann JW. Entrapment and compression neuropathies. In: Green DP ed. *Operative hand surgery*, 2nd ed. New York : Churchill Living-

- stone, 1988.
5. Steven JC. The electrodiagnosis of carpal tunnel syndrome. *American Association of Electrodiagnostic Medicine, Muscle nerve*. 1997 ; 20 : 1477–86.
 6. Phalen GS. Reflections on 21 years experience with carpal tunnel syndrome. *The Journal of The American Medical Association*. 1970 : 212(8) : 1365–7.
 7. Kim JH. Prediction of electromyographic findings based on clinical findings in the patients with carpal tunnel syndrome. *Medical School of Dankook University*. 2003.
 8. Chang MH, Wei SJ, Chiang HL, Wang HM, Hsieh PF, Huang SY. Comparison of motor conduction techniques in the diagnosis of carpal tunnel syndrome. *Neurology*. 2002 ; 58(11) : 1603–7.
 9. Jablecki CK, Andary MT, Floeter MK et al. Practice parameter: Electrodiagnostic studies in carpal tunnel syndrome. Report of the American Association of Electrodiagnostic Medicine, American Academy of Neurology, and the American Academy of Physical Medicine and Rehabilitation. *Neurology*. 2002 ; 58(11) : 1589–92.
 10. Gerritsen AA, de Vet HC, Scholten RJ, Bertelsmann FW, de Krom MC, Bouter LM. Splinting vs surgery in the treatment of carpal tunnel syndrome: a randomized controlled trial. *JAMA*. 2002 ; 288(10) : 1245–51.
 11. Palmer DH, Hanrahan LP. Social and economic costs of carpal tunnel surgery. *Instr Course Lect*. 1995 ; 44 : 167–72.
 12. Hahn SB, Kang ES, Hang HJ, Park YS. Endoscopic carpal tunnel release in carpal tunnel syndrome using the agee technique. *Journal of the Korean Society for Surgery of the Hand*. 2000 ; 5(1) : 54–6.
 13. Son KM. Study of acupuncture. *People's Medical Publishing House*. 2004 : 983–5.
 14. Park SU, Jung WS, Kim YK et al. Clinical assessment of usefulness, effectiveness and safety of Kyejibokryung-hwan on various neuropathies. *Korean Journal of Oriental Medicine*. 2006 ; 27(4) : 135–41.
 15. Higgins JPT, Altman DG. Assessing risk of bias in included studies. In: Julian PTH, Green S(eds). *Cochrane handbook for systematic reviews of interventions*. West Sussex, England : Wiley-Blackwell, 2008 : 187–241.
 16. Bae HS, Jung WS, Hong JW et al. Comparison of therapeutic effect on carpal tunnel syndrome between oriental and western medicine. *Journal of Korean Oriental Medicine*. 2007 ; 28(1) : 87–93.
 17. Ku JY, Lee KH, Cho SW et al. Comparison of the effects between sweet bee venom pharmacopuncture and scolopendrid pharmacopuncture on carpal tunnel syndrome(randomized, controlled clinical trial). *Journal of Pharmacopuncture*. 2010 ; 13(4) : 75–89.
 18. Choi SW, Shin MS, Park MH et al. Clinical study on treatment of the carpal tunnel syndrome with CF herbal acupuncture. *Journal of Pharmacopuncture*. 2005 ; 8(2) : 39–45.
 19. Lim JA, Kim SC, Kim SA, Lee SY, Moon HC. Clinical study on treatment of carpal tunnel syndrome using Scolopendrid herbal acupuncture. *Journal of Pharmacopuncture*. 2005 ; 8(1) : 13–20.
 20. Day SJ, Altman DG. Statistics notes: Blinding in clinical trials and other studies. *BMJ*. 2000 ; 321(7259) : 504.
 21. Schulz KF, Chalmes I, Hayes Rj, Altman DG. Empirical evidence of bias. Dimensions of methodological quality associated with estimates of treatment effects in controlled trials. *JAMA*. 1995 ; 273(5) : 408–12.
 22. Vickers A, Goyal N, Harland R, Rees R. Do certain countries produce only positive results? A systematic review of controlled trials. *Control Clin Trials*. 1998 ; 19 : 159–66.
 23. Ernst E, Lee MS. A trial design that generates only “positive” results. *J Postgrad Med*. 2008 ; 54(3) : 214–6.
 24. Ernst E, Pitler MH. Alternative therapy bias. *Nature*. 1997 ; 385(6616) : 480.
 25. Sarah Rhodes. Publication Bias in Meta-analysis by HR Rothstein, AJ Sutton and M Borenstein (eds). *Journal of the Royal Statistical Society: Series A(Statistics in Society)*. 1998 ; 169(4) : 1012.