



Research paper

Warm needle acupuncture for osteoarthritis: A systematic review protocol[☆]

Ji Hee Jun^{a,1}, Tae-young Choi^{a,1}, Ian Appleyard^b, Jiae Choi^a, Nicola Robinson^b, Jong-In Kim^c,
Myeong Soo Lee PhD^{a,*}

^a Clinical Research Division, Korea Institute of Oriental Medicine, Daejeon, Republic of Korea

^b Allied Health Sciences, London South Bank University, London, UK

^c Division of Acupuncture & Moxibustion Medicine, Kyung Hee Korean Medicine Hospital, Kyung Hee University, Seoul, Republic of Korea

ARTICLE INFO

Article history:

Received 10 June 2016

Received in revised form 28 July 2016

Accepted 28 July 2016

Available online xxx

Keywords:

Acupuncture

Warm needle acupuncture

Osteoarthritis

Systematic review

Protocol

ABSTRACT

Introduction

Warm needle acupuncture (WA) is widely used the treatment in the East Asian countries. However, there is no critically appraised evidence of the potential benefits and harms. The purpose of this systematic review is to evaluate the efficacy of WA for osteoarthritis (OA).

Methods and analysis

Electronic databases will be searched: MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL) and AMED, 6 Korean medical databases (Korea Med, the Korean Traditional Knowledge Portal, OASIS, DBPIA, the Research Information Service System and the Korean Studies Information Service System), 3 Chinese databases (CNKI, VIP and Wanfang) and a Japanese database (CiNii Articles) will be searched from their inception. We will be searched from their inception. Selection of the studies and data extraction and validation will be performed independently by two reviewers. Randomised controlled trials (RCTs) and quasi-RCTs using WA for any type of OA will be considered. The studies will independently undertake study selection, extraction of data and assessment of study quality by two authors. Risk of bias will be assessed using the Cochrane risk of bias standards. All data synthesis and subgroup analyses will be conducted using Review Manager Software.

Dissemination

Findings will be published in a peer-reviewed journals. This systematic review may inform the treatment of OA patients in clinical practice.

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1. Introduction

1.1. Description of the condition

Osteoarthritis (OA) is a structural and functional failure of whole joint [1] and damage to joint cartilage, deterioration of the bone beneath the joint, swelling of the joint with newly formed bone, and mild inflammation of the synovial membrane [2]. Above all, OA is often associated with significant disability and reduction in quality of life [3]. This affects such as the knees, hips, fingers and lower spine. Researchers have reported that the knee joint is affected especially frequently, and the incidence of knee OA is increasing [4]. Unfortunately, the available treatments for OA are not perfect. Therefore, many studies, both pharmacological and non-pharmacological, focus on reducing pain and limitations to patient's daily functioning [5].

1.2. Description of the intervention

Acupuncture and moxibustion have been used as medical treatments in East Asia, including China, Korea and Japan [6]. Moxibustion have various techniques. There are two types of moxibustion: be divided into direct moxibustion and indirect moxibustion. When performing direct moxibustion, moxa sticks are burnt at acupoints directly on the skin. In contrast, in indirect moxibustion, the moxa cone does not touch the skin and is burnt while being insulated from the skin by some substance [7]. Warm needle acupuncture (WA) is the combination of acupuncture with moxibustion by stimulating acupoints with a burning moxa (also called Ai Ye) stick on the handle of the acupuncture needle [8]. The use of WA was first documented in *Shang Han Za Bing Lun* ("Discussion of Cold-Induced Disorders"), a classical Chinese medical book by Zhongjing Zhang (Eastern Han dynasty, 25–220 C.E.) [9]. WA is often used to treat painful conditions such as arthritis, especially rheumatoid arthritis and OA [10,11] as well as musculoskeletal pain conditions [12,13]. WA treatment is transmitted to the acupoint by radiation, moreover, by direction conduction through the shaft of the needle, thereby stimu-

[☆] Trial registration number: PROSPERO 2015: CRD42015024413

* Corresponding author.

Email address: drmslee@gmail.com, mslee@kiom.re.kr (M.S. Lee)

¹ These authors have contributed equally.

lating deep tissue within the acupoint and warming the acupoint on the surface [14].

1.3. How the intervention might work

WA for OA is widely used for treatment and prevention [15,16]. Studies on the treatment of WA on OA have also shown a greater pain relief compared to manual acupuncture [17]. Furthermore, WA has reduced joint fluid and abnormally high serum levels of interleukin-1 beta (IL-1 β) and tumor necrosis factor-alpha (TNF- α), two inflammatory factors in patients with knee OA [18].

1.4. Why it is important to do this review

Many studies have been reported treatment using WA treatment for OA in clinical practice [19,20]. One recent review assessed the efficacy of WA for OA but the most of included studies suffered from high risk of bias [21]. The previous review focused on the WA treatment for knee OA and searched Chinses databases only. Furthermore, the review is outdated. Therefore, the aim of this systematic review was to update, complete and critically evaluate the evidence from randomized clinical trials (RCTs) of WA for OA.

2. Methods

2.1. Study registration

This protocol review has been registered on PROSPERO 2015 (registration number CRD42015024413) [22].

2.2. Criteria for considering studies for this review

2.2.1. Types of studies

This systematic review will only include RCTs and quasi-RCTs. Observational, cohort, case reports, case series, non-RCT, animal and experimental studies will be excluded. No language restrictions will be imposed.

2.2.2. Types of participants

Patients suffering from OA will be included regardless of joint location (e.g., chronic condition of the neck, near the ends of the fingers, at the base of the thumb, back, hip, and knee). We will also include patients with both sexes and any age. Included patients will have been diagnosed with OA according to the American College of Rheumatology (ACR) criteria [23–25], the equivalent European League Against Rheumatism (EULAR) criteria [26–28], or the Clinical Guideline of New Drugs for Traditional Chinese Medicine [29]. Studies will be excluded if they include patients with rheumatoid arthritis, ankylosing arthritis, joint tuberculosis, purulent arthritis, allergic arthritis, Kashin-Beck disease or Podagra.

2.2.3. Types of interventions and controls

Studies that evaluate WA as the sole intervention will be included. Warm needle will be defined as moxa being attached to the needle once it is inserted. Traditionally, traditional medicine practitioners usually attach burning moxa to the handle of the AT needle to improve the effectiveness of the therapy. Electro-warmed needles and infrared radiation will be excluded. The combined intervention include western medicine or rehabilitation or physiotherapy, but exclude alternative therapy such as herbal medicine, chuna, acupuncture. A combined intervention will include western medicine or rehabilitation or physiotherapy, but will exclude any that combines other

alternative therapies such as herbal medicine, Tuina, or other types of acupuncture.

2.2.4. Type of outcome measures

• Primary outcomes

- 1) Treatment efficacy: the number of patients whose OA symptoms improved and treatment effectiveness.
- 2) Pain: associated scale measured on the visual analogue scale (VAS) [30], Western Ontario and McMaster Universities Arthritis Index (WOMAC) of pain [31], a numerical rating scale (NRS), Verbal Rating Scale (VRS), the Faces Pain Scale-Revised (FPS-R), etc.
- 3) Function of joint: measured by recognized scales including Western Ontario and MacMaster universities arthritis index (WOMAC), Lequesne score, etc.

• Secondary outcomes

- 1) Quality of life (QoL): measured using a validated questionnaire, such as the short-form (36-item) health survey (SF-36) [32] or another validated scale.
2. Adverse events

2.3. Search method for identifying the studies

2.3.1. Electronic searches

Electronic databases searched from their inception and will include MEDLINE, EMBASE, the Cochrane Central Register of Controlled Trials (CENTRAL) and AMED, 6 Korean databases (Korea Med, the Korean Traditional Knowledge Portal, OASIS, DBPIA, the Research Information Service System and the Korean Studies Information Service System), 3 Chinese Databases (CNKI, VIP and Wanfang), and the Japanese database (CiNii Articles). The search strategy will include warm needling acupuncture in English, Chinese and Korean.

2.3.2. Searches of other resources

The authors will scan the reference lists and retrieve additional studies. In addition, authors will search the WHO International Clinical Trials Registry Platform (ICTRP) (<http://apps.who.int/trialsearch/>) and Google Scholar (<http://scholar.google.co.kr/>). Dissertations of degree will be included. The ClinicalTrials.gov registry (<http://clinicaltrials.gov/>) will be searched for any unpublished trials.

2.3.3. Search strategy

The strategy for searching MEDLINE is described in Appendix A. The strategy for searching CNKI is described in Appendix B. Similar search strategies will be applied to other databases.

2.4. Data collection, extraction and assessment

2.4.1. Selection of studies

Two reviewers (JHJ and TYC) will independently screen the titles and abstracts for searched studies, and perform study selection and record their decisions according to predefined criteria. Another reviewers (MSL) will resolve disagreements of section study. Study selection will be documented and summarised in Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) flow diagram [33].

2.4.2. Data extraction

Two reviewers (JHJ and TYC) will read studies and independently extract the data using a standard data extraction form. The form will be comprised of type of OA, participants, intervention

group treatment, control group treatment, outcome and result. Disagreements of section study will be resolved by another reviewers (MSL). We will use Grading of Recommendations Assessment, Development and Evaluation (GRADE) software to judge the quality of evidence for data from Cochrane Systematic Reviews to create a Summary of Findings table [34]. Additionally, the details of the treatment regimens will be summarised in a table. When reported data are insufficient or unclear, an author will contact the first author or corresponding authors by e-mail or telephone to request missing or clarification data.

2.4.3. Assessment of risk of bias

To assess the quality of included studies according to the criteria described in the Cochrane Handbook for Systematic Reviews of Intervention [35]. The following items will be assessed: 1) random sequence generation; 2) allocation concealment; 3) blinding of participants and personnel; 4) blinding of outcome assessment; 5) completeness of outcome data; 6) completeness of reporting; 7) other sources of bias. Each trial will be categorized as having a low (L), unclear (U), or high (H) risk of bias. If necessary, we will contact the authors of assessed trials for clarification. We will resolve any differences in opinion through discussion or consultation with all of the authors.

2.4.4. Data synthesis

All statistical analyses will be performed using the Review Manager (Cochrane Collaboration Software, RevMan) version 5.3. For dichotomous data, we will present the treatment effects and use the risk ratios (RR) with 95% confidence intervals (CIs). For the continuous data, we will use the mean differences (MD) with 95% CIs. If outcome variables are measured on different scales, we will use a standard mean differences (SMD) analysis with 95% CIs.

2.4.5. Unit of analysis issues

The systematic review will include data from parallel-group studies for the meta-analysis. For cross-over trials, the first treatment period of data will be analyzed. In that case if there is more than one control group, each group will constitute a separate unit of analysis. If there are multiple treatment time observations, the data will be analysed as either short term (within 30days) or long term (over 30-days). In addition, analysis will be divided into various types of OA.

2.4.6. Assessment of heterogeneity

We will use fix model if there is no evidence of heterogeneity; if not we will apply random effect model. If a meta-analysis is possible, we will use the I^2 statistic for quantifying inconsistencies across the included studies. A result 50% cut off point would represent substantial heterogeneity. If heterogeneity is observed, we will conduct subgroup analyses [36].

2.4.7. Subgroup analysis and the investigation of heterogeneity

If studies and data are sufficient, subgroup analyses will be conducted according to:

- 1) Type of OA (e.g, knees, hip, back or fingers)
- 2) Type of control intervention (e.g, western medicine, no treatment or usual care)

2.4.8. Sensitivity analysis

We will use sensitivity analyses to investigate suspected funnel plot asymmetry. Sensitivity analysis will be conducted according to the following criteria:

- 1.) Methodological qualities (sequence generation, allocation concealment, or blinding in the assessment of outcomes and symptom severity)
- 2.) Sample size (more or less than 40 participants in each group)

In the analysis, we will exclude high risk of bias studies and compare the results with those using the worst-case scenario to combine studies. Then we will have a discussion to decide whether the high risk of bias studies should be excluded on the bias of sample size, strength of evidence and influence on pooled effect size.

2.4.9. Assessment of reporting biases

If more than 10 studies are available, we will conduct funnel plot for publication bias and small study effects using Egger's method. Funnel plot asymmetry is certainly not same as publication bias. We will attempt to distinguish the possible reasons for the asymmetry, therefore, included poor methodological quality and true heterogeneity of studies [37].

3. Discussion

This protocol for a systematic review will provide a detailed summary of the current state of evidence regarding the effectiveness of the WA in treating the symptoms of patients with OA. The review will be useful to patients and healthcare providers in determining the appropriate role of WA in the treatment of OA.

Contribution of authors

The protocol of a review was drafted by all authors. The search strategy was established by J.H.J., I.A., T.Y.C. and N.R. Copies of studies will be obtained by J.H.J. and T.Y.C. Selection of the studies to include will be performed by J.H.J., J.C. and J.I.K. Lee M.S. will act as an arbiter in the study selection stage. Extraction of data from studies will be conducted by J.H.J., C.J., I.A., and J.I.K. Entering data into RevMan 5.3.0 Version will be conducted by J.H.J. and J.C.I. Interpretation of results will be performed by all authors. The final review will be drafted and revised by all authors. The review will be updated by J.H.J., I.A., N.R., T.Y.C. and M.S.L.

Funding

J.H.J., T.Y.C., J.C. and M.S.L. were supported by the Korea Institute of Oriental Medicine (K162921 and K16111). The authors alone are responsible for the writing and content of paper.

Conflict of interest statement

The authors declare that they have no potential conflict of interest.

Appendix A. MEDLINE search strategy(PubMed)

- #1. exp osteoarthritis/
- #2. osteoarth*.tw
- #3. (degenerative adj2 arthritis).mp.
- #4. arthrosis.mp.
- #5. or/#1-#4
- #6. exp acupuncture therapy/
- #7. warm needle thechnique.mp.
- #8. warm needle acupuncture.mp
- #9. warm needle moxibustion.mp
- #10. warm-needling. mp

#11. wen zhen. mp
 #12. warm\$ acupuncture. mp
 #13. or/#6-#12
 #14. exp Randomized Controlled Trials as Topic/
 #15. exp Clinical Trials as Topic/
 #16. exp controlled clinical trials as topic/
 #17. (randomized controlled trial* or controlled clinical trial* or randomizer* or randomly* or placebo or clinical trial* or controlled trial*).mp.
 #18. or/#14 – #17
 #19. #5 and #13and #18

Appendix B. CNKI search strategy

#1. 温针
 #2. 温针灸
 #3. warm acupuncture
 #4. warm needle acupuncture
 #5. warming needle moxibustion
 #6./or #1-5
 #7.骨关节炎
 #8. osteoarthritis OR osteoarthrosis OR osteoarthritis OR Degenerative Osteoarthritis OR Knee osteoarthritis OR Hip Osteoarthritis OR spine osteoarthritis OR Lumbar Spine Osteoarthritis OR Primary Hypertrophic Osteoarthropathy OR Atlantoxial Osteoarthritis OR senior osteoarthritis OR anteromedial osteoarthritis OR advanced osteoarthritis OR hand osteoarthritis
 #9. OA OR KOA
 #10. or/#7-9
 #11. 随机
 #12. 对照
 #13. Randomized trials
 #14. or/#11-13
 #15. #6 and #10 and #14

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