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Review article

Traditional Chinese medicine in patients with osteoarthritis of the knee

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ABSTRACT

To evaluate whether the use of traditional Chinese medicine (TCM; 中醫 zhōng yī) influences symptoms or functional outcomes in patients with osteoarthritis (OA) of the knee (膝關節炎 xī guān jié yán).

A systematic review of randomized control trials was conducted. Searches for studies in PubMed that were performed between 1965 and August 2013, and retrieved studies were subjected to reference screening. The types of studies included in our review were 1) placebo-based or comparative studies; 2) open label, single-blinded or double-blinded studies; 3) studies evaluating the efficacy of TCM for treating OA of the knee; and 4) studies evaluating only TCM or combination preparations. Trials were conducted with participants over 18 years of age with knee pain and at least three of the following characteristics: 1) an age greater than 50 years; 2) morning stiffness lasting for fewer than 30 min; 3) a crackling or grating sensation; 4) bony tenderness of the knee; 5) bony enlargement of the knee; or 6) no detectable warmth of the joint to the touch. Studies were rated for risk of bias and graded for quality.

After screening, 104 studies that satisfied the eligibility requirements were identified, and only 18 randomized control trials were included in the quantitative and qualitative synthesis. Upon review, we found “moderate-quality” evidence of effects from acupuncture (針灸 zhēn jiǔ) on pain, which was measured using a visual analogue scale, and physical function, which was measured using qigong (氣功 qì gōng) with motion. “Low-quality” evidence was found regarding the effects of acupuncture on physical function, and no evidence was found regarding the effects of herbal medicine on pain or physical function. Herbal patches (藥布 yào bù) appeared to affect pain and physical and function, but these effects were not found to be significant.

The initial findings included in this review suggest that acupuncture is a promising intervention according to the primary outcome measure, pain, and qigong with motion is an effective method for treating physical function. However, according to the Grades of Recommendation, Assessment, Development, and Evaluation criteria, only moderate-quality evidence was found in these studies. Further rigorous studies are warranted to investigate the application of TCM in treating OA of knee.

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1. Introduction

Osteoarthritis (OA), originating from the Greek words “bone”, “joint”, and “inflammation”, is one of the most common causes of

pain and disability in middle-aged and older people.¹ OA is currently considered an inflammatory disorder of movable joints that is involved in several pathological features such as deterioration and abrasion of articular cartilage and formation of new bone at the articular surface and subchondral bone, resulting in limitation of joint movement.^{2–4} The incidence of symptomatic OA is likely to increase because of the aging population and obesity epidemic.⁵ In the United States, the prevalence of OA of the knee (膝關節炎 xī guān jié yán) is 10% in men and 13% in women in millions among adults 60 years of age or older in 2010.⁵ Radiographic

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evidence of OA generally appears in those over 65 years of age, approximately 80% of whom are over 75 years of age.⁶ OA is essentially an inflammatory disease, causing signs and symptoms of inflammation such as stiffness and joint effusion.⁴ OA causes articular cartilage loss, capsular stretching, muscle weakness, bony remodeling, synovitis, and ligament laxity, ultimately leading to malalignment of the knee joint. The abnormal structure resulting from OA causes abnormal focal stress in the knee joint and induces a vicious cycle of joint damage. The major complaint of patients with OA of the knee is pain derived from tearing of the patella-femoral joint, inflammation of soft tissue, and collection of synovial fluid.^{3,7} Treatment of OA includes intraarticular corticosteroid injection, oral acetaminophen, capsaicin cane, and nonsteroidal antiinflammatory drugs (NSAIDs).⁸

According to the basic theory of traditional Chinese medicine (TCM; 中醫 zhōng yī), OA is an “impediment disease (痹病 bì bìng)”, which refers to a group of diseases resulting from “invasion of wind, cold, and dampness (風寒濕侵襲 fēng hán shī qīn xí)”.⁹ Mavrommtis et al (2012) reported that acupuncture (針灸 zhēn jiǔ) with etoricoxib reduced pain more than did sham acupuncture with etoricoxib or etoricoxib alone in patients with knee OA.¹⁰ Duhuo Jisheng Tang treatment for 4 weeks can reduce pain and stiffness and improve physical function in knee OA patients.¹¹ Moxibustion (艾灸 ài jiǔ) is a traditional therapy to treat diseases through thermal stimulation by burning herb when the knee pain was due to “the invasion of the cold (風邪侵襲 fēng xié qīn xí)”.¹² Herbal patch (藥布 yào bù) is made through the powder of the herbs, vegetable oil and excipient, like *Componere Hydrargyrum* (Shenyao), then cooling and coating with cloth or paper. Herbal patch is placed on the injured area or acupoint (穴位 xué wèi) for reducing “swelling and pain (腫痛 zhǒng tòng)”.¹³ Qigong (氣功 qì gōng) is an energy exercise and therapy that assume the existence of a “Qi (氣 qì)” circulating throughout the body and in the surrounding environment.¹⁴ Massage therapy (推拿 tuī ná) is that the doctor uses their hands to manipulate the patient’s body to relax and “dredge the meridians (疏通經絡 shū tōng jīng luò)” and promote “Qi flowing and blood circulating (氣血循環 qì xuè xún huán)”.¹⁵ Therefore, the aim of the present study was to determine whether the use of TCM influences symptoms or functional outcomes in patients with OA of the knee through a systematic review of randomized control trials (RCTs) from the PubMed and MEDLINE databases.

2. Materials and methods

2.1. Data source and review process

The PubMed database was used to search for relevant studies conducted between 1965 and August 2013. The PubMed database comprises more than 23 million citations of biomedical literature from MEDLINE, life science journals, and online books. The articles used in our analysis were published in English, and the full text of these studies is available through PubMed Central and publisher web sites. The keywords in our study were osteoarthritis, traditional Chinese medicine (TCM; 中醫 zhōng yī), acupuncture (針灸 zhēn jiǔ), herb, e herbal patches (藥布 yào bù), moxibustion (艾灸 ài jiǔ), Massage therapy (推拿 tuī ná) and qigong (氣功 qì gōng). TCM indicates the use of acupuncture, herbs, herbal patches, moxibustion, massage therapy, or integration for treatment. The major keyword “osteoarthritis” was combined with the other keywords separately. For example, “((osteoarthritis) AND acupuncture) AND English [Language]” or (osteoarthritis) AND Traditional Chinese Medicine AND English [Language], to search relevant RCTs for all TCM treatments for OA. Articles satisfying the search criteria were entered into a review process, and the full texts collected according to the criteria were further reviewed.

2.2. Types of studies

Only RCTs with participants appropriately allocated into treatment and control groups were included in our study. RCTs that 1) were placebo-based or comparative; 2) were open label, single-blinded or double-blinded; 3) evaluated the efficacy of TCM in OA of the knee; or 4) evaluated TCM only or a combination of preparations were included.

2.3. Types of participants

The inclusion criteria referred Zhang and Jordan (2010)⁵ for participants were (1) an age >50 years and (2) symptoms and signs of OA of the knee. Patients with at least three of the following characteristics were considered to have typical symptoms and signs of OA: (A) morning stiffness lasting fewer than 30 min; (B) a crackling or grating sensation; (C) bony tenderness of the knee; (D) bony enlargement of the knee; and (E) no detectable warmth of the joint to the touch. The exclusion criteria were (1) OA secondary to other etiologies such as trauma, infection, and rheumatoid arthritis; (2) OA located at multiple sites, and inability of the treatment to target specific joints and (3) if those multiple sites included OA of knee.

2.4. Types of interventions

The types of interventions analyzed in our review were acupuncture or electroacupuncture (EA; 電針 diàn zhēn), herbs or formulas, herbal patches, moxibustion, qigong and massage therapy, according to the theory of TCM. Studies designed to treat OA by integrating TCM and modern medicine was also included. Studies involving laser acupuncture or acupuncture with local drug injections and nonclinical studies, such as animal and cell line studies, were excluded.

2.5. Types of outcome measurement

The studies analyzed in this review were required to include an assessment before and after intervention and a follow-up period. All studies applied tools for assessing the effectiveness of treatment, namely (1) tools for measuring pain intensity such as the Visual Analogue Scale (VAS) and Numeric Rating Scale (NRS) and (2) tools for measuring functional status or disability including the Western Ontario and McMaster Universities Arthritis Index (WOMAC), Short Form 36 (SF-36) health survey, and other reliable and valid methods. The timing of assessment was recorded, and the evaluations were blinded.

2.6. Risk-of-bias assessment and quality

The checklists of the Cochrane back review group were used as a methodological template to assess the risk of bias of individual RCTs. The methodological quality of trials was classified as “low”, “moderate”, and “high” by using a trial method adapted from previous guidelines (Table 1),^{16,17} and studies rated equal or more than 6 of 12 were considered to have a low risk of bias.

2.7. Quality of evidence

The overall quality of evidence was evaluated according to the Grades of Recommendation, Assessment, Development, and Evaluation (GRADE) criteria, as in previous research¹⁸ (Table 2). In brief, studies that were observational, limited, inconsistent, indirect, or imprecise or exhibited publication bias were considered to yield “low-quality” evidence. By contrast, studies that involved randomized trials and large effect sizes and showed evidence of a

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