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Clinical Observation of Fire-needle Therapy plus Tuina for Senile Knee Osteoarthritis

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Abstract

Objective: To observe the therapeutic efficacy of fire-needle therapy plus tuina in treating primary knee osteoarthritis (KOA) in the elderly.

Methods: Twenty-three patients with KOA were intervened by pricking with fire-needle therapy plus tuina, and evaluated by using the Western Ontario and McMaster Universities osteoarthritis index (WOMAC) before and after intervention.

Results: After intervention, the total score, scores of pain, rigidity, and activities of daily living of WOMAC dropped significantly ($P<0.05$).

Conclusion: Pricking with fire needle plus tuina can produce a significant therapeutic efficacy in treating KOA in the elderly, thus worth application in clinic.

Key Words

Osteoarthritis, Knee; Acupuncture Therapy; Fire-needle Therapy; Pricking Needling; Tuina; Massage; Aged

As a common degenerative disease, knee osteoarthritis (KOA) often affects the mid-aged and old populations, majorly involving articular cartilages, synovium and bones, causing degeneration of knee articular cartilage, narrowed articular space, and bone hyperplasia. Usually, KOA is not manifested by general symptoms, but morning rigidity, pain and discomfort in knees which may increase when going up or down stairs, or even unable to walk because of articular swelling, thus influencing the quality of life. Besides prosthetic surgery, Western medicine also offers conservative treatments such as nonsteroid anti-inflammatory drugs, glucocorticoid, and sodium hyaluronate for intra-articular injection; while Chinese medicine mainly provides Chinese medications for oral administration. In spite of Western and Chinese medications, the analgesic effects are rather limited. We adopted tuina plus fire-needle pricking in treating senile KOA from 2010 to 2013. The report is now given as follows.

1 Clinical Materials

1.1 Diagnostic criteria

The diagnostic criteria were made by referring to the relevant references[1-3]: persistent pain in knee during the recent 1 month; bone hyperplasia of knee joint according to X-ray; the test result of synovial fluid conforming to osteoartiritis; people aged over 60 years can neglect the synovial fluid test; knee articular rigidity ＜30 min; joint click during

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movement. KOA can be diagnosed when the first item was met, coupled with item 2, or item 3, 5, 6, or item 4, 5, 6.

1.2 Inclusion criteria

Conforming to the clinical and radiological diagnostic criteria; age 60-75; not taking any other relevant medications or treatments.

1.3 Exclusion criteria

Against the above diagnostic or inclusion criteria; skin infection, bone tumor or any other contraindications of acupuncture-moxibustion; coupled with other types of rheumatoid arthritis; injuries of soft tissues or bone joints; severe primary diseases of cardio-cerebrovascular, liver, kidney, or hematopoietic systems; use of medications such as glucocorticoid that may affect the therapeutic efficacy; severe swelling or effusion (floating patella test: positive).

1.4 Statistical method

Data were processed by using SPSS 18.0 version statistical software. The measurement data were expressed by ($\bar{x} \pm s$) and analyzed by using *t*-test. The ranked data were analyzed by using rank sum test. Rate was compared by using Chi-square test.

1.5 General data

Totally 23 eligible subjects were recruited, including 18 males and 5 females; age 61-75 years old, averaged at 68.5 years old; disease duration ranging from 2 months to 8 years, averaged at 2 years. The rheumatoid factor (RF) test showed normal in all of the subjects, indicating that there was no rheumatoid arthritis; 2 of the subjects had mild anemia. In case of the high age range, all of the subjects were ordered with tests for blood pressure, blood fat, and blood glucose. The results were normal except that six subjects had high blood pressure, which was controlled by oral antihypertensive drugs. CT scan showed that the 23 subjects all suffered from hyperplasia of knee joint of various degrees, indicating the classic degenerative changes.

2 Treatment Methods

2.1 Tuina

First, perform Na-grasping and Rou-kneading at knee joint from the top down for 3 min, for thoroughly relaxing the rigid muscles (Figure 1). Then, perform digital Rou-kneading at Xuehai (SP 10), Neixiyan (EX-LE 4), Dubi (ST 35), Heding (EX-LE 2), and Yinlingquan (SP 9), 1 min for each point (Figure 2). Afterwards, hold the bilateral edges of the interspace between patella and femur, the thumb and the rest four fingers separately on each side, and move up and down for 15 times, within the patient's tolerance (Figure 3). Then perform Ca-rubbing around knee joint (with Vaseline as medium), till skin turns slightly red and hot (Figure 4). Finally, Yao-shaking is performed for 5-6 times.

The above tuina manipulations were given once a day, 10 times as a treatment course, for totally 2 courses.

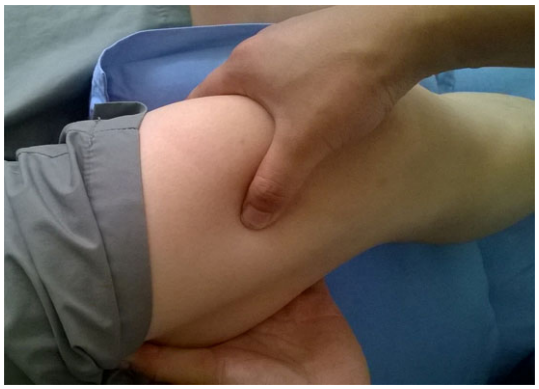

Figure 1. Na-grasping and Rou-kneading manipulations

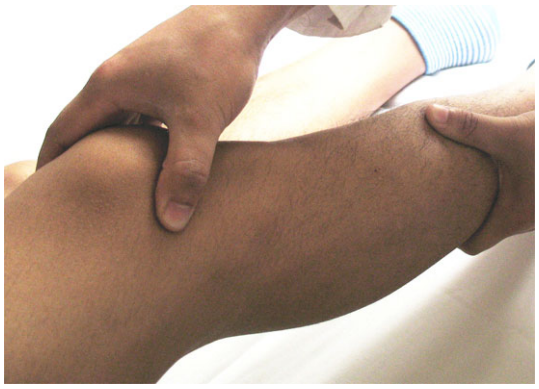

Figure 2. Digital Rou-kneading manipulation

Figure 3. Nie-pinching and Wo-holding manipulations

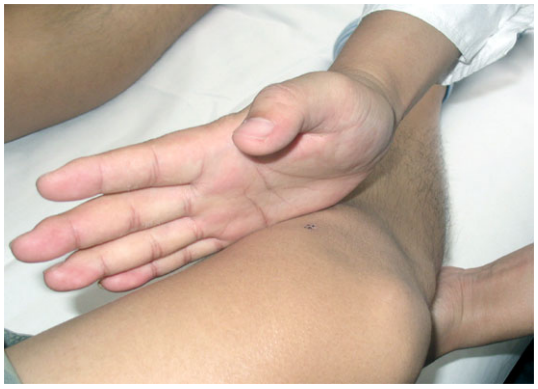

Figure 4. Ca-rubbing manipulation

2.2 Fire-needle therapy

The tuina manipulations were followed by fire-needle therapy.

Acupoints: Xuehai (SP 10), Neixiyan (EX-LE 4), Dubi (ST 35), Heding (EX-LE 2), Yinlingquan (SP 9), and Ashi point.

Operation: Mark a cross at the to-be-treated area with finger nail, then sterilize with 75% alcohol. Ask the patient to close eyes or to distract attention to reduce tension. Put the fire needle on to an alcohol lamp to turn till brightly white, and then use the needle to prick the selected acupoints, by depth of 0.3-0.5 cun. Swiftly remove the needle after inserting. The needle holes were not supposed to press unless it was bleeding. The treatment was given once every other day, 10-day treatments as a treatment course, and the therapeutic efficacies were evaluated after 2 courses.

Caution: Mark a cross at the selected points first with finger nail for pricking precisely. Make sure that the fire needle is burnt brightly white to prevent intensive pain, and the needle has to be burnt each time before pricking. The patient should take a sitting position, and when the patient faints from needling, the doctor has to immediately stop needling and take emergency actions.

3 Observation of Therapeutic Efficacy

3.1 Observation index

The Western Ontario and McMaster Universities osteoarthritis index (WOMAC)[4] was observed before and after intervention to measure the therapeutic efficacy. WOMAC is a scoring system specifically for coxarthritis and knee arthritis. It estimates the severity of arthritis and therapeutic efficacy according to the relevant symptoms and signs. There are totally 24 items, measuring the joint structure and function respectively from pain, rigidity, and joint motility. The higher the WOMAC score, the severer the arthritis.

3.2 Criteria of therapeutic efficacy[1-3]

Cured: There was no pain or swelling in knee, with completely normal motility function and fluid test.

Marked effect: There was no pain or swelling in knee, and the joint function was substantially recovered.

Improvement: The pain and swelling of knee joints were improved, and the joint function was almost restored but motility was still limited.

Failure: Knee joint pain was not obviously improved, joint was swelling, and motility was limited.

3.3 Treatment result

After intervention, the pain, stiffness, and dysfunction scores dropped significantly ($P<0.05$), indicating that fire-needle therapy plus tuina is effective in treating KOA.

At the end of intervention, 19 subjects were cured, the recovery rate was 82.6% and the total effective rate was 95.7%. Three months later, the follow-up study showed that 18 subjects were recovered, the recovery rate was 78.3% and total effective rate was 95.7%. Six months later, 15 patients were recovered, the recovery rate was 65.2% and the total effective rate was 87.0%. The follow-up studies showed that this treatment protocol has a stable long-term therapeutic efficacy and a low relapse rate.

Table 1. Comparison of WOMAC scores before and after intervention ($\bar{x}\pm s$, score)

Time	*n*	Pain	Stiffness	Dysfunction	Total
Pre-treatment	23	15.13±5.66	10.13±1.47	62.57±10.77	89.95±18.37
Post-treatment	23	10.13±1.08[1)]	3.55±1.12[1)]	23.55±7.25[1)]	35.41±7.13[1)]

Note: Compared with pre-treatment, 1) $P<0.05$

Table 2. Observation of short-term and long-term therapeutic efficacies (case)

Time	Cured	Marked effect	Improvement	Failure	Total effective rate (%)
End of intervention	19	2	1	1	95.7
Three months after the end of intervention	18	3	1	1	95.7
Six months after the end of intervention	15	4	1	3	87.0

4 Discussion

Osteoarthritis is a common degenerative disease affecting axial and peripheral joints, pathologically featured by progressive degeneration and disappearance of articular cartilages, as well as the corresponding changes of articular edges and bone mass beneath the cartilages. The early stage is majorly manifested by the damages of cartilages, while the late stage is by the destruction of bone structure and deformity of joint[5]. Osteoarthritis usually affects the old people, and the incidence increases with age. Long-term manual work is often found in the patients. Knee joint is a predilection site of osteoarthritis, including primary and secondary types according to the existence of topical cause, while the primary type is more common. KOA is majorly manifested by severe knee joint pain and motor impairment, both directly affecting the quality of life. Currently, the cause and pathogenesis of KOA remain unclear, while age, obesity, over-exertion, genetic factor, and gender are all the plausible causes[6]. So far, the conservative treatment provided by the Western medicine mainly covers non-steroid anti-inflammatory drugs and glucocorticoid, which may cause severe adverse events while producing limited therapeutic efficacies. And, the other option is surgery, which only brings more mental and financial burdens to the patients but shows no significant advantage compared to physical therapy[7]. Traditional Chinese medicine can produce content efficacy in treating KOA. Xu L, et al[8] divided subjects into an acupuncture group intervened by acupuncture plus moxibustion and a Western medication group intervened by Glucosamine sulfate capsules plus intra-articular injection. Five weeks later, it showed that the therapeutic efficacy and security evaluation of the acupuncture group were significantly superior to those in the Western medication group. The 3-month and 6-month follow-up studies also showed that the therapeutic efficacy of the acupuncture group was significantly higher than that of the Western medication group. After studying the therapeutic efficacy of acupuncture plus Chinese medicinal fumigation in treating KOA, Wang WL, et al[9] found that this treatment protocol can rapidly release pain and improve symptoms.

Osteoarthritis falls under the scope of bone Bi-Impediment or joint-pain disease in traditional Chinese medicine. *Huang Di Nei Jing (Yellow Emperor's Classic of Internal Medicine)* says that Bi-Impediment is caused by wind, cold and dampness. *Jin Gui Yao Lue* (*Synopsis of Prescriptions of the Golden Chamber*) emphasizes that the pathogenesis of joint-pain disease should be the invasion of external pathogens on the basis of insufficient healthy qi. The old people usually are weak in essence and qi, which makes it easy for the external pathogens to combine with blood stasis and phlegm and accumulate in the knee joint, subsequently aggravating the pathological changes of knee. Therefore, KOA should be treated by expelling wind and cold, unblocking blood stasis, warming and activating meridians, eliminating impediment and killing pain[10]. Fire-needle therapy treats disease by swiftly inserting the burnt needle into acupoint. *Ling Shu* (*Spiritual Pivot*) records that Bi-Impediment can be eliminated by inserting burnt needle, which indicates that fire-needle therapy can treat Bi-Impediment. In this study, fire-needle therapy was adopted to treat KOA for its strong efficacy in warming and activating meridians and expelling cold. Topical points such as Xuehai (SP 10), Neixiyan (EX-LE 4), Dubi (ST 35), Heding (EX-LE 2), and Yinlingquan (SP 9) were selected. Xuehai (SP 10) can activate and supplement blood, based on the saying that to treat blood for wind, as wind will be gone when blood is activated. Next, as the elderly usually suffers from insufficiency of essence and blood, needling Xuehai (SP 10) can tonify blood and yin aspect, activate the flow of blood and expel wind. Heding (EX-LE 2), Neixiyan (EX-LE 4), and Dubi (ST 35) are all essential points for knee joint pain. As the He-Sea point of the Spleen Meridian, Yinlingquan (SP 9) can reinforce spleen and regulate qi flow, unblock and activate meridians.

Tuina can stimulate the participation of endorphin system and enhance the pain threshold, meanwhile influencing the secretion of central 5-HT and peripheral acetylcholine and catecholamine, thus effectively kill pain[11]. Similar to fire-needle therapy, tuina can also warm meridian and eliminate pain.

This study suggests that combining fire-needle therapy and tuina can effectively relieve pain, rigidity, and dysfunction, and it has a stable long-term effect. Limited by condition, we only conducted a simple clinical observation here, but we are expecting multi-centered large-sample studies in the future based on the further classification of the disease from the angle of traditional Chinese medicine, for providing the optimal treatment protocol for KOA.

Conflict of Interest

There was no conflict of interest in this article.

Acknowledgments

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Statement of Informed Consent

All individual participants knew this study.

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