Clinical Efficacy of Needle Warming through Moxibustion Combined with Tuina on Retrogressive Knee Osteoarthritis

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Abstract [**Objectives**] To study the clinical efficacy of needle warming through moxibustion combined with Tuina on retrogressive knee osteoarthritis, and to explore the effective treatment with traditional Chinese medicine characteristics. [**Methods**] 60 patients with retrogressive knee osteoarthritis were randomly divided into control group ($n = 30$) and observation group ($n = 30$). The control group was treated with Tuina, while the observation group was treated with needle warming through moxibustion combined with Tuina. The clinical cure rate, pain score and knee symptom score were compared and analyzed. [**Results**] The clinical cure rate was 96.70% in the observation group and 73.30% in the control group, and the difference was statistically significant ($P < 0.05$). After one course of treatment, the VAS score and knee Lequesne score of the two groups were decreased ($P < 0.05$), and the decrease degree of the observation group was better than that of the control group ($P < 0.05$). The joint rest pain score, joint motion pain score, tenderness score, swelling score, morning stiffness score and walking ability score were higher than those in the treatment group ($P < 0.05$). [**Conclusions**] Needle warming through moxibustion combined with Tuina manipulation can significantly alleviate knee degenerative disease, eliminate inflammation, reduce edema, ease pain and improve the quality of life of patients.

Key words Retrogressive knee osteoarthritis, Acupuncture and moxibustion, Tuina

1 Introduction

Traditional Chinese medicine (TCM) believes that retrogressive knee osteoarthritis is a disease caused by aging, deficiency of liver and kidney, deficiency of qi and blood, and wind, cold and dampness, which is called "arthralgia syndrome". It is a disease caused by hyperplasia and degeneration of surrounding tissues caused by chronic bone soft tissue inflammation, so it is more common in middle-aged and elderly patients. In young people, it often occurs in trauma. The pathological changes of this disease are characterized by osteoporosis, joint meniscus degeneration, aging of cartilage and ligaments, and formation of bone spurs around joints, which are often characterized by local swelling, pain, abnormal activity function, and even knee joint stiffness and varus and valgus deformation. There are more middle-aged and elderly patients, which seriously affect their lives[1]. Western medicine treatment is mainly through surgical treatment and drug anti-inflammatory and analgesic treatment. Surgical treatment has large trauma, slow recovery and high cost, which is difficult for many patients to accept. Drug anti-inflammatory and analgesic treatment damages the gastrointestinal tract and has a greater impact on organ function. Traditional Chinese medicine has unique efficacy and new methods in the treatment of chronic diseases[2]. In recent years, the theory of traditional Chinese medicine has developed vigorously, and there is a deeper understanding of knee retrogressive diseases, and more and more treatment methods[3]. Acupuncture and moxibustion therapy and Tuina therapy are both characteristic diagnosis and treatment methods of traditional Chinese medicine, which have special curative effect in the treatment of knee arthritis, but only Tuina therapy can relieve knee pain and improve knee functions. We used needle warming through moxibustion combined with Tuina to treat 60 patients of knee osteoarthritis, and achieved definite results.

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2 Data and methods

2.1 General data Sixty patients with retrogressive knee osteoarthritis admitted to the Department of Rehabilitation Medicine of the Second People's Hospital of Huaiyuan County in Anhui Province from March 2020 to June 2023 were randomly divided into two groups, the observation group and the control group, with 30 patients in each group. There were 14 males and 16 females in the observation group. The mean age was (44.71 ± 4.54) years and the mean course of disease was (3.62 ± 1.54) years. There were 12 males and 18 females in the control group. The mean age was (43.93 ± 5.28) years and the mean course of disease was (3.75 ± 1.61) years. Statistical analysis of the two groups of patients ($P > 0.05$), with clinical comparability, this study improved medical records, patients signed the medical consent form.

2.2 Diagnostic criteria The diagnosis was based on the clinical signs and symptoms in the *Guidelines for the Diagnosis and Treatment of Knee Osteoarthritis with Integrated Traditional Chinese and Western Medicine (2023 edition)*[4].

2.3 Inclusion criteria (i) Those not having a good effect after 3 months of regular treatment. (ii) Over 40 years old and under 75 years old. (iii) Patients with disease in one knee. (iv) Patients who have been treated with oral ibuprofen analgesics or have not been treated with Western medicine.

2.4 Exclusion criteria (i) Patients with knee joint trauma. (ii) Patients with severe underlying disease. (iii) Patients who did not cooperate with group treatment. (iv) Knee pain caused by other

diseases such as bone tumors. (v) Severe deformity of knee joint.

2.5 Treatment methods The patients in the control group were treated with Tuina: (i) the patient is in the prostrate position, the doctor uses the turning method, kneading method and pressing method to act on the Governor Vessel, Bladder Meridian, bilateral Shenshu acupoints, Yaoyan acupoint, Huantiao acupoint, Weizhong acupoint and Chengshan acupoint, with hot as the moderate; finally, the patient bends the affected limb as far as possible so that the heel touches the buttocks, about 10 times. (ii) The patient is in the supine position, the doctor uses the plucking method and the tendon-regulating method act on the ligaments around the knee joint, pluck the quadriceps femoris, press the medial and lateral collateral ligaments, press the bilateral knee eye acupoints, pull and stretch the knee joint, and massage the patella with hot as the moderate. (iii) Press the medial and lateral knee, Xuehai, Yinlingquan and Yanglingquan acupoints, and let the patient contract the quadriceps femoris with equal length, with soreness as the degree, once a day, 20 min each time, 10 times a course of treatment, to release adhesions and lubricate joints. On the basis of the treatment method for control group, the observation group was treated with needle warming through moxibustion, and the patients were placed in the supine position, with a pillow in the popliteal fossa to make the knee flexion. A 3 cm acupuncture needle was inserted vertically into the knee joint cavity to the degree of soreness, and then the needle handle was wrapped with moxa and lit to the degree of warmth. At the end of the burning, added the moxa continuously for 30 min, and at the same time, the needle handle of Yanglingquan was wrapped with moxa to the degree of soreness, ignited to the degree of warmth, and then added the moxa continuously for 30 min after the burning, once a day, 10 times as a course of treatment.

2.6 Observation indicators (i) We observed the clinical total effective rate of the patients. (ii) The VAS score was evaluated according to the impact of pain on patients, and the higher the score, the more severe the pain. (iii) The severity or recovery of knee joint function was evaluated according to the knee Lequesne score scale[5]. The score of joint rest pain was 0 – 3 points, the higher the score, the more serious it was. The score of joint movement pain was 0 – 3 points, the score of tenderness was 0 – 3 points, the higher the score, the more serious it was. The score of swelling was 0 – 3 points, the higher the score, the more serious it was. The score of morning stiffness was 0 – 3 points, the higher the score, the more serious it was. The score of walking ability was 0 – 6 points, the higher the score, the more serious it was. (iv) Pain VAS scale score: The higher the score, the more serious it was, and the most serious score was 10 points.

2.7 Efficacy criteria Cured: no pain and normal function of knee joint. Improved: slight pain of knee joint and normal motor function; effective: improvement of knee joint pain and slight limitation of motor function; Ineffective: Knee pain and dyskinesia were not relieved.

2.8 Statistical methods SPSS 24.0 software was used to analyze the relevant data, and t test was used to calculate the clinical signs and symptoms, Lequesne score, pain VAS score and mean ± standard deviation ($\bar{x} \pm s$) before and after treatment. After treatment, the clinical efficacy of the two groups was expressed by percentage (%), using χ^2 test, $P<0.05$ as the difference was statistically significant.

3 Results and analysis

3.1 Comparison of clinical efficacy The total effective rate was 96.70%, which was higher than that of the control group (73.30%) ($P<0.05$), as shown in Table 1.

Table 1 Comparison of clinical efficacy between the two groups ($n=30$)

Group	Cured	Improved	Effective	Ineffective	Total effective rate//%
Observation	20	5	4	1	96.7*
Control	10	4	8	8	73.3

NOTE Compared with the control group, *$P<0.05$.

3.2 Comparison of knee joint Lequesne scores before and after treatment in the two groups (Table 2)

Table 2 Comparison of knee joint Lequesne scores before and after treatment in the two groups ($\bar{x} \pm s$, points, $n=30$)

Group	Time	Pressing pain	Swelling	Morning stiffness	Walking ability
Observation	Before treatment	2.54 ± 0.45	2.69 ± 0.72	3.13 ± 0.54	5.71 ± 0.82
	After treatment	1.36 ± 0.42*#	1.49 ± 0.51*#	1.26 ± 0.36*#	2.27 ± 0.57*#
Control	Before treatment	2.68 ± 0.36	2.72 ± 0.24	3.16 ± 0.36	5.82 ± 0.68
	After treatment	2.18 ± 0.52*	2.07 ± 0.42*	2.26 ± 0.72*	4.25 ± 0.82*

NOTE *$P<0.05$ compared with the group before treatment; #$P<0.05$ compared with the control group after treatment. The same below.

2.3 Comparison of VAS scores between the two groups before and after treatment (Table 3)

Table 3 Comparison of VAS scores between the two groups before and after treatment ($\bar{x} \pm s$, points, $n=30$)

Group	Before treatment	After treatment
Observation	6.61 ± 1.66	2.05 ± 0.83*#
Control	6.72 ± 1.28	5.12 ± 0.67*

4 Discussion

Retrogressive knee osteoarthritis is called "arthralgia syndrome" in traditional Chinese medicine. Deficiency of liver and kidney, deficiency of healthy qi, invasion of wind, cold and dampness into the human body, leading to the decline of body function, joint degenerative disease, and then develop into chronic degeneration, chronic wear and tear, chronic hyperplasia of cartilage in the joint, progressive development of chronic inflammation, stimulation of

surrounding nerves, blood vessels and ligaments. It forms clinical signs and symptoms such as local rest pain, movement pain, swelling, limited movement, dysfunction and joint deformity[6]. The early symptoms are occasional weakness, soreness and pain, and joint stiffness during activities, which are easy to ignore. Early knee degeneration can be found by ordinary X-ray examination. The internal and external spaces of the knee joint will be asymmetric and narrow, and the tibial plateau will form small osteophytes[7]. The pathological changes of retrogressive knee osteoarthritis are slow and irreversible, and can only be treated by surgery in the end. Knee replacement is a large and expensive operation. Oral anti-inflammatory and analgesic drugs cause slow damage to organ function, and patients are generally difficult to accept long-term treatment[8]. Traditional Chinese medicine treatment is non-invasive or minimally invasive, which can intervene early and prevent the development of diseases, so it is the urgent desire of the majority of patients to find a specific method of traditional Chinese medicine[9]. Traditional Chinese medicine (TCM) of osteoarthritis (OA) believes that with the increase of age, pathological changes occur in the viscera, such as deficiency of liver and kidney, deficiency of qi and blood, disorder of qi movement, which result in the failure to nourish the tendons and bones, weaken the ability of joints to resist pathogens, and wind, cold and dampness invade the skin and joints, resulting in pathological changes[10], so the treatment should be warming and dredging the meridians, dispelling cold and relieving pain.

Both needle warming through moxibustion treatment and Tuina treatment are traditional external treatment of traditional Chinese medicine, which have outstanding curative effect and are easily accepted by patients[11]. Tuina treatment is a characteristic therapy of traditional Chinese medicine, which is effective. It acts on knee ligaments and tissues of patients through manipulation. Pressing and kneading acupoints can dredge meridians, reduce swelling and relieve pain, warm yang and dispel cold, nourish muscles, release adhesions and relieve pain. Tuina manipulation acts on the skin, muscles and bones, the degree of manipulation is appropriate, the adhesion plucking and acupoint kneading should be strong penetration, the soft tissue around the knee joint is thin, Tuina manipulation is single and easy to operate. However, pure Tuina maneuver is not effective for retrogressive knee osteoarthritis[12]. The needle warming through moxibustion is that on the basis of acupuncture points, the needle handle is wound with moxa and ignited. In this study, acupuncture operates at bilateral knee eye acupoints, the needle tip directly reaches the joint cavity, the heat of moxa reaches the blood vessels and nerves of the surrounding tissues in the joint cavity through the acupuncture needle, which can warm yang and dispel cold, promote blood circulation and remove blood stasis, diminish inflammation and relieve pain, regulate yin and yang, improve the immunity of patients, cure aseptic inflammatory reaction, eliminate edema. Besides, acupuncture has the functions of dredging channels and collaterals and relieving pain, and moxibustion has the functions of warming Yang and dispelling cold, restoring yang and rescuing adverse qi, and relieving swelling and pain[13]. In this study, acupoints of bilateral knee eye, Yanglingquan and Xuehai acupoints were selected, and acupuncture of bilateral knee eye directly reached the affected area, which was mainly used to treat knee joint swelling and pain. Yanglingquan and Xuehai could tonify qi and blood, nourish meridians, strengthen blood circulation, remove blood stasis, dispel wind and remove dampness, dredge qi and blood, and restore joint function. The *Yellow Emperor's Medical Classic* (*Huang Di Nei Jing*) records: "The disease is in the tendons, spasmodic myalgia, called tendon paralysis, pricking the tendons, the disease will be cured". The combination of Yanglingquan and Xiyan acupoints can relieve spasm and pain, release local adhesion, and reduce swelling and pain[14]. Besides, the combination of the two groups of acupoints can make the curative effect of the needle warming through moxibustion more prominent, warm yang, dispel cold, dredge collaterals and relieve pain; Tuina treatment on this group of acupoints can play a better role in smoothing joints, releasing adhesions, removing swelling and relieving pain[15].

Needle warming through moxibustion is a unique external treatment of traditional Chinese medicine. It has the functions of stimulating acupoints, dredging meridians, promoting qi circulation and relieving pain, warming yang and dispelling cold, promoting blood circulation and removing blood stasis, promoting the generation of joint lubricant and nourishing joints[16]. This method for treating the degenerative arthritis of the knee joint has the characteristics of quickly eliminating local edema and relieving pain, has remarkable effect, and is worthy of clinical application.

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