

Research Progress of Non-Surgical Treatment of Osteoarthritis of the Knee in Chinese Medicine

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Abstract: Osteoarthritis of the knee is a common degenerative osteoarthropathy, which is clinically characterised by stiffness of the knee joint with pain, swelling, and limitation of activity, with a high incidence rate, more in women than in men, and the main group of patients is the middle-aged and the elderly, which has a serious adverse impact on their physiology and psychology, and also brings a certain degree of negative impact on the quality of life and standard of living. Modern medical treatment of osteoarthritis of the knee mainly adopts oral non-steroidal anti-inflammatory drugs and surgical treatment, which is a single therapy with greater side effects and trauma. In contrast, Chinese medicine has a unique advantage in the treatment of osteoarthritis of the knee, with acupuncture and moxibustion, cupping, acupressure, traditional Chinese medicine, external application of traditional Chinese medicine and other therapeutic methods, which is simple and inexpensive. Therefore, by reviewing a large amount of literature at home and abroad, the author reviewed the clinical status of non-surgical treatment of osteoarthritis of the knee with Chinese medicine in recent years.

Keywords: Chinese medicine non-surgical treatment; osteoarthritis of the knee; literature review

1. Introduction

Knee osteoarthritis, also known as degenerative knee joint disease, senile arthritis, degenerative osteoarthritis, etc., is a common chronic disease in clinical practice. Its pathological characteristics are degenerative wear and tear of articular cartilage, reactive hyperplasia of joint margins and subchondral bone, and formation of bone redundancy. Its clinical manifestations are the presence of obvious pain accompanied by activity dysfunction in the knee joint area, morning stiffness, friction sound, bony enlargement, etc. The pain is obvious when going up and down the steps, and can be relieved after resting ^[1]. With the aggravation of the disease, knee joint deformation and partial or total loss of function occur, which seriously affects the quality of life of patients and brings a heavy economic burden to society, as shown in Figure 1. With the accelerating aging process in China, clinical studies have shown that the probability of osteoarthritis of the knee is about 15%, and the main age of the disease is above 60 years old ^[2]. This disease belongs to the category of "bone paralysis" in Chinese medicine, "Huang Di Nei Jing" said: "The disease is in the bone, the bone weight can not be lifted, the bone marrow is sore and painful, the cold to the name of bone paralysis. "It is believed that the disease is caused by wind, cold and dampness, internal deficiency of liver and kidney, loss of nourishment of tendons and bones, and prolonged phlegm and stasis stagnation, which is the evidence of the underlying deficiency. Traditional Chinese medicine treatment of this disease is the principle of internal tonic liver and kidney, in addition to the wind, cold, dampness, with the support of blood and soft tendons, most of the use of traditional Chinese medicine internal and external use. In "Spiritual Pivot - Hai Lun", "the meridians belong to the internal organs and externally to the limbs and joints", which suggests the connection between the meridians and the joints ^[3]. Non-surgical treatment of Chinese medicine through acupuncture, massage can dredge the meridians, warm the meridians to disperse cold, improve local blood circulation, and play a role in the treatment of osteoarthritis of the knee; and moxibustion through the burning of the warm effect can be prompted to increase the temperature of the local skin tissues, further accelerate the flow of blood to increase the rate of metabolism, which is conducive to promoting the effective elimination of local inflammatory substances or absorption, improve the oedema and hyperplasia of the knee joints, and promote the function of the joints and hyperplasia of knee joint tissues, and promote the recovery of joint function. The progress of Chinese medicine non-surgical treatment of knee osteoarthritis in recent years is

summarised as follows.

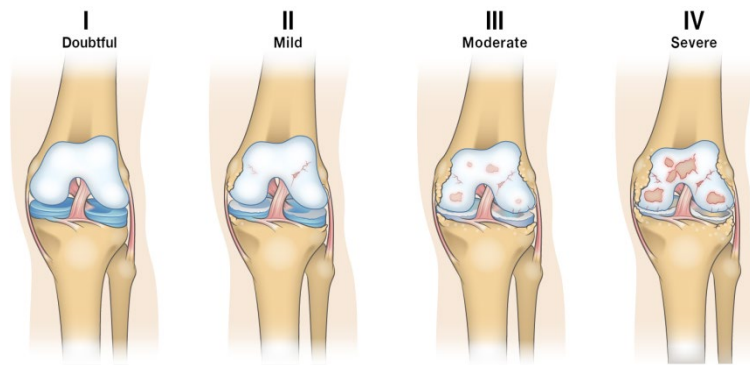


Figure 1: Four stages of knee osteoarthritis

2. Pathogenesis in Chinese medicine

Chinese medicine usually classifies osteoarthritis of the knee in the category of "paralysis" and "bone paralysis", and believes that the main pathogenesis is the deficiency of the liver and kidney as well as the loss of muscle and bone nourishment. The disease was first described in the "Neijing", "Suwen - Paralysis" has a more systematic discussion on the cause, mechanism, classification of symptoms, prognosis, etc., and believes that "wind, cold and dampness are mixed, and become paralysis. The wind wins for paralysis, the cold wins for pain paralysis, and the moisture wins for paralysis. This emphasises that external evil is the causative factor of the disease. Tang - Sun Simiao, "Thousand-Golden-Prescriptions" recorded: "Low back pain is caused by kidney qi deficiency. Wind-evil is easy to invade if living in damp places or not treating too late, which could cause the exopathogen into the feet and knees, resulting in hemiplegia, cold arthralgia, weakened condition and severe joint pain." It suggested that the pathogenesis of osteoarthritis of the knee is qi and blood deficiency of liver and kidney. And the treatment should be to wind-dispelling, pain-relieving and dehumidification [4].

3. Non-surgical treatment with Chinese medicine

3.1. Traditional Chinese Medicine (TCM) for internal use

Internal administration of Chinese medicines is to boil them into soup or make them into pills, etc., and absorb the medicinal effect through oral administration. Pan Jianke [5] used computer in CBN, CNKI, Wipo and other databases to search and screen to get 22 randomised controlled trials of kidney tonifying and blood activating traditional Chinese medicine compared with non-steroidal anti-inflammatory drug treatment, and his conclusion was that traditional Chinese medicines with the effect of tonifying the kidneys and blood activation have certain efficacy in treating osteoarthritis of the knee and have fewer side effects. Wang Maozu [6] selected 146 patients with osteoarthritis of the knee, the treatment group was treated with oral Shengjie Tang and Duoju parasitic soup, and the control group was treated with oral Loxolofen sodium tablets, and external application of Musk Bone-setting Rheumatism Cream to the pain points, and found that the efficacy of oral Shengjie Tang and Duoju parasitic soup was better than that of the control group's oral Loxolofen sodium tablets, and external analgesic ointment in improving the functional activities of the knee joints, and that in terms of the long-term therapeutic efficacy of the treatment group. Shengjie Tang combined with Duoju Sheng Tang was also superior to the control group in terms of long-term efficacy. Subsequently, Liu Changyi et al. [7] found that the use of traditional Chinese medicine in the treatment of degenerative osteoarthritis of the knee could effectively alleviate the symptoms and signs, promote the recovery of joint function, improve the quality of daily life, and down-regulate the levels of COMP and MMP-3, with a good safety profile. Chen, Li et al. [8] treated 60 cases of postmenopausal osteoarthritis of the knee with the formula of tonifying the kidney and activating the blood, and found that traditional Chinese medicine of tonifying the kidney and activating the blood could improve the symptoms of postmenopausal osteoarthritis of the knee, and it might intervene in postmenopausal osteoarthritis of the knee by regulating the level of oestrogen and the inflammatory cytokines.

3.2. Apply externally with Chinese medicine

External application of traditional Chinese medicine is a common method of treating diseases, which is a method of applying fresh herbs chopped and pounded into a paste, or specific herbs ground into a fine surface and blended with a blending agent to make a paste and apply it on the patient's skin to treat diseases. The external application of Chinese herbs has the effects of relaxing tendons and activating collaterals, activating blood circulation and removing blood stasis, subduing swellings and dispersing knots, and reducing inflammation and analgesia. The dried Chinese medicine powder applied on the body surface can stimulate the nerve endings, dilate blood vessels through reflexes, promote blood circulation in the lesion area, improve the nutrition of the lesion tissues, and play the purpose of anti-inflammation, swelling and analgesia. The drugs directly contact the lesion site and tissues, the drugs can directly penetrate the skin directly to the lesion, produce a relative advantageous drug concentration in the affected area, play a stronger pharmacological effect, and play a better therapeutic effect. Early scholars Li Jun ^[9] to activate blood circulation and eliminate blood stasis to relieve pain as a method, the use of blood-activating cream external treatment of patients with osteoarthritis of the knee, and its cure rate and improvement rate are better than the patients of the western medicine treatment group. Subsequently, Li Hua et al. ^[10] used the department's own Chinese medicine external application preparation to treat the disease, and the therapeutic effect was better than that of the oral western medicine group. Li Suqin ^[11] gave 90 patients with osteoarthritis of the knee specific Chinese medicine external treatment. With astragalus, angelica, red peony, antifungal, mulberry branches, frankincense, myrrh, dahuric dahurica and other 17 flavours of traditional Chinese medicine into a fine powder with ginger juice, honey into a paste, external application of the knee joints, the effect of the course of treatment is significantly better than the topical application of FUTALIN group.

3.3. Chinese herbal fumigation

Liu Lin et al. ^[12] divided 80 cases of cold paralysis type knee osteoarthritis patients into two groups, the control group oral glucosamine sulfate, the observation group in the control group on the basis of traditional Chinese medicine fumigation. Chinese medicine fumigation formula: Sichuan peppercorns, cinnamon sticks, translucent herb, dahurica dahurica, etc. 10 g. Decoction of about 2000 ml of water, first smoked the affected knee, and then hot compresses were applied to the affected knee when the water temperature was appropriate, and the treatment cycle of the two groups was 15 days. The results showed that the total effective rate of the observation group reached 97. 5%, which was higher than 90% of the control group, and the effect was obvious. Chen Doudou et al. ^[13] used traditional Chinese medicine decoction to fumigate the affected limbs to treat the disease, and the control group took *Cilopodium* orally, and the results showed that the total effective rate of the treatment group was 91. 4%, which was better than the total effective rate of the treatment of the control group. Thus, it was shown that herbal fumigation can effectively control the progression of the disease, and it is easy to administer and simple to operate.

3.4. Acupuncture therapy

Acupuncture therapy is a unique therapeutic means of the motherland medicine, which uses needles to pierce the acupoints of the human body to treat diseases and health care in accordance with the theory of traditional Chinese medicine. Acupuncture therapy has the advantages of simple operation, clear therapeutic effect, economy and safety, and has been trusted and loved by the people of our country since ancient times. With a variety of techniques and many schools, acupuncture therapy has accumulated a wealth of experience in the prevention and treatment of diseases. The method of treating diseases by applying (sensing) trace current waves of human bioelectricity to the needles is known as "electroacupuncture" after the needles are inserted into the acupoints to obtain qi. Li Weidong ^[14] used millimetre needle - tug-of-war acupuncture to treat patients, with electroacupuncture as the control group. After treatment, the VAS and WOMAC scores of both groups decreased significantly compared with those before treatment. Gu Ziyong et al. ^[15] randomly divided patients with osteoarthritis of the knee into two groups, the treatment group was treated with electroacupuncture, and the control group was treated with oral celecoxib capsules, and concluded that electroacupuncture could effectively relieve the clinical symptoms and signs of patients. Zhang Yafeng ^[16] used warm needle therapy to treat 32 patients with knee osteoarthritis and controlled with ordinary acupuncture treatment therapy, the total effective rate of the warm needle group and ordinary acupuncture group were 93. 7% and 78. 1% respectively, and the efficacy of warm acupuncture and moxibustion was significantly better than that

of ordinary acupuncture treatment. Yu Hua et al. [17] selected Yanglingquan, calf's nose, foot Sanli, Liangqiu, Crane's top acupoints, etc. , blood stasis and blood stagnation add the Sea of Blood, Yang deficiency and cold condensation add Qihai, dampness stagnation add Yinlingquan, the control group simple acupuncture, the observation group using fire needle dense stabbing method of treatment, and its results show that fire needle dense stabbing method has the efficacy of warming the meridians, dispelling cold and removing dampness, regulating the pulse and collaterals, and promoting the meridians to alleviate pain.

3.5. Tuina

Tuina therapy is a therapeutic method of preventing and treating diseases under the guidance of traditional Chinese medicine theories and combined with modern medical theories by applying Tuina techniques to acupuncture points on the surface of the human body. Tuina action on the body surface, joints, acupoints can improve local blood circulation, loosen joint adhesions, relieve muscle tension and spasm, acting on the knee joint can promote the absorption of inflammation and oedema in the joints, loosen the adhesions of the soft tissues, and improve the function of joint movement. Wang Jianguo et al. [18] treatment group using massage therapy, the control group using acupuncture treatment, the results show that the clinical efficacy of massage treatment of osteoarthritis of the knee is accurate, the patient's pain improvement is more obvious. Wu Jiahang [19] and others used He's orthopedic injury massage appropriate technology for the treatment of osteoarthritis of the knee, 12 weeks after the treatment to observe the efficacy of the conclusion can be seen, He's orthopedic injury massage appropriate technology for the treatment of osteoarthritis of the knee has a good therapeutic effect, is suitable for the promotion of the clinic. Xiu Wenming et al. [20] used manipulative massage to treat patients with this disease, patients were maintained at supine position and fully extended the knees. Xiu Wenming applied manipulation to loosen the muscles around the affected knee, patellar edge and thigh muscles, released the adhesion and spasm. And then looked for the pain point, used pushing, kneading, stroking tendons and other manipulation techniques to re-flatten the fibre and relieve pain. Then pressed the acupoints such as Tsusanli, XueHai, Liangqiu, Yanglingquan. Finally applied rubbing method to permeate heat around the affected knee. It can effectively alleviate pain and has no side effects, which can make patients easy to accept. The efficacy of this disease. Chen Tiewu et al. [21] treated 80 cases of patients with osteoarthritis of the knee with wintergreen cream local cream and massage, and found that the method can significantly improve the clinical symptoms, and believed that part of the mechanism may be to reduce the content of synovial fluid of the knee joint TNF- α , IL-1 and MMP-3. Deng Baofeng et al. [22] conducted a randomised control of Chinese massage techniques with meloxicam dispersible tablets for the treatment of osteoarthritis of the knee and confirmed that Chinese massage could effectively improve the muscle strength of the quadriceps muscle of the patients.

3.6. Moxibustion (Chinese medicine)

Moxibustion is also known as Chinese medicine moxibustion. It is a therapeutic method in which moxa leaves are processed into moxa floss, and then the floss is ignited to burn and warm the skin (acupoints) directly or indirectly. Moxibustion has the effect of warming the meridians and dispersing cold, moving qi and channels, eliminating swelling and dispersing knots, supporting the Yang and fixing the hair, raising Yang and lifting the sun, pulling out toxins and draining heat, preventing diseases and health care, and beautifying the skin. It is especially suitable for chronic debilitating diseases and wind-cold-dampness attacks. Due to the different ways of using moxa materials, it can be divided into moxa stick moxibustion, moxa cone moxibustion, warm needle moxibustion and warm moxibustion device moxibustion and other treatment methods. Jiao Yong et al. [23] divided the patients into two groups, one group took conventional moxibustion treatment plan, one group implemented thermal moxibustion treatment plan, thermal moxibustion treatment implementation of gyration and mild measures, conventional moxibustion treatment implementation of mild moxibustion treatment measures, after the completion of the treatment to compare the two groups of joint pain and stiffness, the clinical therapeutic effect of the heat sensitive moxibustion treatment plan is far better than that of taking the conventional moxibustion treatment. A clinical study of knee osteoarthritis by direct moxibustion treatment measures, through the follow-up after treatment, observed that the physical pain and dysfunction scores have shown different degrees of decline, compared with the treatment, the fastest walking time decreased significantly, the clinical therapeutic effect is remarkable [24]. In addition, a clinical study was conducted to evaluate the clinical therapeutic effect and safety of spacer moxibustion for osteoarthritis of the knee through the implementation of Meta-assessment to further determine the effectiveness and safety of spacer moxibustion for the clinical treatment of osteoarthritis

of the knee. This therapeutic measure can improve the body's immune system, and further effectively achieve the effect of treatment and defence against the disease [25,26].

3.7. Comprehensive Treatment

Chen Desheng et al. [27] used acupuncture and moxibustion combined with Chinese medicine ion implantation method to treat osteoarthritis of the knee, and the control group was treated with acupuncture alone, comparing the improvement of patients' knee joint symptom points before and after treatment, the results showed that the effective rate of treatment in the combined group was 93.75, which was significantly higher than that of the control group (71.88%), and the patients' knee joint pain was significantly relieved and optimise patients' joint function and improve joint mobility. Liu Fayuan et al. [28] gave 52 cases of joint group patients with manipulation therapy supplemented by oral treatment with Duhuo parasitic soup, the control group oral glucosamine, through the paralysis tablets, the two groups were treated for 2 weeks, the results show that the joint group of patients in all phases of the total effective rate is higher than the control group, Duhuo parasitic soup combined with kneading knee push patella acupoints can effectively alleviate the pain in the knee, relax the periarticular tissues, rebuild the stability of the knee, improve the function of the knee. Fan Rong et al. [29] randomly divided 120 patients into treatment group and control group, respectively, using warm acupuncture combined with Tuina manipulation and oral western medicine treatment, the results of the treatment group's effective rate (96.7%) was higher than that of the control group (85.0%). Fu Dongmei et al. [30] treated 23 patients with Tuina combined with warm acupuncture and moxibustion, and the results showed that the clinical efficacy of Tuina combined with warm acupuncture and moxibustion was significant after treatment. And Guasha is through the special Guasha apparatus, dipped in the medium, in the body surface for repeated scraping, so that the local Guasha, the clinical application is widely used. Zhang Guilin [31] randomly divided 45 cases of knee osteoarthritis patients into observation group and control group. The observation group was treated with Tuina combined with Guasha, while the control group was treated with Tuina separately. The results showed that the total effective rate of the observation group was 95.65%, and the total effective rate of the control group was 81.82%, and the total effective rate of the observation group in treating KOA was better than that of the control group. Yang Yanfeng et al. [32] gave 125 cases of this disease with massage combined with the treatment of traditional Chinese medicine hot compresses, the results showed that the total effective rate of the patients' treatment for six months was 83.80%, and the total effective rate for one year was 87.32%, suggesting that massage combined with the traditional Chinese medicine hot compresses for the treatment of osteoarthritis of the knee has a remarkable clinical effect. The Chinese medicine can be made into pills and so on, and the medicinal effect can be absorbed through oral intake. Traditional Chinese medicine gongfu refers to eight-duanjin, taijiquan, yijinjing and other ancient methods. The TCM gongfu refers to ancient health exercises such as Ba Duan Jin, Tai Chi Chuan, Yi Jin Jing, etc., which can strengthen the body through reasonable exercise. Li Sibin et al. [33] chose 60 cases of patients for massage combined with horse crotch potential gongfu exercise, the patients' therapeutic effect is remarkable, high compliance, suggesting that massage combined with Chinese medicine gongfu exercise treatment of the disease efficacy is accurate.

4. Summary

In summary, the non-surgical treatment of osteoarthritis of the knee in Chinese medicine is rich and varied, showing the strong characteristics of national medicine, which can be applied individually with one method or a combination of multiple methods [34], and overall, the effect of comprehensive treatment is better than that of the simple method. The clinical effect of non-surgical treatment of the disease by Chinese medicine parties is relatively obvious, proving that traditional medicine has an indispensable and important position in the rapid development situation of modern medicine. The combination of Chinese medicine with statistics, biology and other modern medical research methods will further promote human understanding of osteoarthritis of the knee, enrich the treatment of this disease and improve the efficacy of its clinical treatment. The treatment method is simple, inexpensive, and with few side effects, etc. According to the patient's condition, individualised treatment plan, single therapy or multiple therapies in combination, or sequential treatment integrated therapy can be adopted. This paper summarises the current status of clinical research on non-manual treatment of knee osteoarthritis in Chinese medicine in recent years, with a view to providing new directions and ideas for future treatment.

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