Warm Acupuncture in the Treatment of Osteoarthritis of the Knee Joint

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Abstract. Osteoarthritis of the knee (KOA) is a long-term deterioration disease in middle and old age, and its final level of disability reached 53%. In contrast to western medicine, which has many side effects such as bleeding and gastric perforation and ulceration, warm acupuncture in Chinese medicine has the advantages of easy operation and precise efficacy, in addition to circumventing the abuse of western medicine. This study presents four related combination treatments for KOA from warm acupuncture. The results show that warm acupuncture could improve knee mobility and pain. Meanwhile, warm acupuncture combined with pricking and bleeding can significantly improve knee joint motor function and pain in gouty knee osteoarthritis patients. Warm acupuncture combined with traditional Chinese medicine could further improve the knee joint function and pain problems in KOA patients. Warm acupuncture combined with western medicine achieves a certain effect, which effectively reduces the oxidative stress response of the body and improve pain and body's motor function problems. Warm acupuncture can also be combined with multiple therapies to treat diseases synergistically and has different therapeutic effects.

Keywords: Warm acupuncture, Osteoarthritis of the knee joint, Combination therapy.

1. Introduction

KOA is a long-cycle degenerative disease that affects mainly middle-aged and elderly people aged 40 years and above, and its Chinese pathology is "paralysis" and "impotence", with a final disability rate of 53%, which brings a serious burden to society. The main symptom is knee pain, which increases after exercise, especially when going down stairs, and decreases after rest. The joint is either painful, swollen, burning, or tingling; or there is mild pain and tenderness. KOA is currently treated with Western medicine, including treatments such as injectable drugs, medications (such as NSAIDs, opioids) and other treatments, but Western medicine has many side effects when treating KOA, such as bleeding and gastric perforation ulcers [1,2].

There are some problems with Western medical treatment, more and more patients are inclined to use Chinese medicine methods for treatment. Currently, Traditional Chinese Medicine (TCM) methods include Tuina, acupuncture, and herbal medicine. In addition to circumventing the abuse of Western medicine, these methods have the advantages of easy operation and exact efficacy. Among these methods, acupuncture treatment is not only recognized by the Rheumatology Society in the USA and the Scottish Intercollegiate Guidelines Network, but is also a highly recommended KOA treatment (Level A) [1,3]. In addition to traditional acupuncture, warm acupuncture also is one of the most commonly used and popular therapies, which is more effective. Therefore, this study presents the principles and practical cases of four related combination treatments from the perspective of warm acupuncture treatment for KOA.

2. Warm acupuncture

Warm acupuncture is one of the most commonly used and popular therapies, and its overall efficacy is superior when compared with other TCM treatments for KOA, but its further validation is still needed [1]. Warm acupuncture is an acupuncture method combined with moxa, which is placed on the needles after acupuncture and then ignited. The heat generated from fired moxa could be transferred to the body through the needles to prevent and treat disease. Acupuncture can significantly

reduce the inflammatory response of KOA and alleviate the local inflammatory response. It has a significant inhibitory effect on the apoptosis of chondrocytes, and balances the role of cartilage extracellular matrix. In addition, acupuncture can increase the knee joint strength, adjust the the joint pressure, regulates local microcirculation, and reduce intraosseous pressure. Secondly, acupuncture also has the ability to modulate analgesic mediators and exert pain-relieving effects [4]. Moxibustion generates energy appropriate for the body's cellular metabolism and immune function, while activating weakened cells that lack energy. When it acts on acupuncture points, near-infrared radiation possesses strong penetrating power and efficiently transmits energy along the meridians to the lesion site and acts [5]. Warm acupuncture combines both characteristics to produce better efficacy on diseases.

Previous studies show that warm acupuncture can improve knee mobility, pain in patients with knee osteoarthritis. In an experiment, Du Jia compared warm acupuncture with conventional Western medicine (taking diclofenac sodium extended-release tablets) for the elderly knee osteoarthritis. After treatment, the efficiency of warm acupuncture treatment was 94.00% higher than the efficiency of conventional Western medicine treatment 76.00%, and the efficacy of warm acupuncture was better, and the patients showed significant improvement in knee function and pain [6].

3. Dual Combination treatments based on warm acupuncture

In clinical treatment, the combination of warm acupuncture and moxibustion with other therapeutic methods can achieve better therapeutic effects, and there are various ways of combination. The study mainly discusses the combined treatment of warm acupuncture with pricking and bloodletting, traditional Chinese medicine, western medicine and the integrated application of warm acupuncture.

3.1. Warm acupuncture combined with pricking and bleeding

Bloodletting is one of the common methods, that is, using a three-pronged needle, puncturing an acupuncture point, or puncturing a local area to let the blood out, and then achieve the treatment of removing blood stasis, opening the meridians and activating the channels, relieving pain. Furthermore, meridian bloodletting can promote the relaxation and contraction of blood vessels and local blood circulation, releasing stagnant blood, thus achieving therapeutic effects. Warm acupuncture is a therapy that combines acupuncture with moxibustion. Acupuncture on specific acupuncture points can have the effect of opening the meridians and benefiting the kidneys, moving qi and unblocking the channels. At the same time, moxibustion is effective in treating qi stagnation and blood stasis by transferring heat to the acupuncture points to activate and invigorate the blood. Therefore, the combination of the two therapies can significantly improve the function of the knee joint, reduce pain, relieve clinical symptoms, and improve the therapeutic effect. [7].

The combination method of warm acupuncture and bloodletting has a good effect on knee joint motor function and pain in gouty knee osteoarthritis patients. The overall efficacy is good, but more sample trials need to confirm the efficacy of this combination therapy. By way of example, Li Zheng divided the patients with gouty knee osteoarthritis into two groups with each of 43 patients, the first group received warm acupuncture and the other group received the combination of acupuncture and bloodletting method on the basis of the former. The results showed that the second group had better knee pain, mobility, muscle strength, function, flexion deformity, joint stability and total knee score than the first group [8].

Hu Yi et al. randomly divided the patients into two different groups, one group was treated with acupuncture and bloodletting, and the other group was treated with warm acupuncture in combination with the former. The overall effectiveness rates after treatment were 60.00% and 86.67% in the two groups, respectively, and the effectiveness of the combined treatment was more significant. [7]. It indicates that warm acupuncture combined with acupuncture and bloodletting has better efficiency.

3.2. Combined use of warm acupuncture and Chinese medicine

According to Chinese medical theory, the medicines collected, concocted, formulated, and explained the mechanism of action to guide clinical use are collectively called " Chinese medicine". Chinese herbal medicines can be used internally or externally, and the combination with warm acupuncture can further improve the knee function and pain problems of KOA patients.

Because of the different effects of herbal medicines, different aspects can be treated by combining different herbal medicines. Zhao Liming compared the conventional group used the warm acupuncture treatment protocol, with the study group used the combination of Wenyang Tongbi decoction with warm acupuncture treatment protocol. After treatment, the combination of Wenyang Tongbi decoction could effectively reduce the level of MMP-3, MMP-9 and inflammatory factors in elderly osteoarthritis of the knee, thus alleviating the destruction of bone and cartilage structures in patients [9]. In another research, patients were arbitrarily grouped into a celecoxib group (CL group) and a Chinese herbal medicine group (CM group), both with 44 patients. The CL group received celecoxib capsules, and the CM group received the combination of warm acupuncture and moxibustion therapy with addition of Modified Danggui Sini Decoction, and the efficacy of the treatment was compared. It is found that this combination therapy with addition of Modified Danggui Sini Decoction could achieve good results in the treatment of KOA, significantly reducing the symptoms of knee pain and swelling, and improving the function of the knee joint [10]. Sheng Guangyun used a randomized number table to divide the 80 patients into a conventional group, which received Xitong Waixi lotion treatment, and a combined group, which was treated with warm acupuncture on top of the former and found that the clinical efficacy of the combined group was significantly improved after treatment ($p=0.006$) [11].

3.3. Warm acupuncture with western medicine

Non-steroidal anti-inflammatory drugs (NSAIDs) and opioids are commonly used in the treatment of KOA with Western medicine, and both have similarities in terms of pain and physical function improvement. However, both types of drug efficacy showed more disadvantages than benefits, with significant drawbacks. Opioids not only cause immediate reactions such as nausea, drowsiness and vomiting after use, but long-term use can also lead to adverse events such as fractures and drug dependence. In the UK, US, Canada and Australia, opioids remain one of the prescribed medications for osteoarthritis pain, despite the availability of safer, more analgesic treatments. Opioids also cause more adverse events than non-steroidal drugs. NSAIDs such as meloxicam are the mainstay of treatment for osteoarthritis and are effective in relieving the patient's initial symptoms. However, meloxicam has a high incidence of side effects, including bleeding, gastric perforation ulcers, the increased risks of cardiovascular disease, and a high rate of relapse after treatment with the actual drug [12, 13].

In contrast, warm acupuncture combined with western medicine can achieve certain effects. For example, for KOA, warm acupuncture in combination with meloxicam can significantly reduce the oxidative stress, which is a key factor in the pathogenesis and development of KOA. In general, the free radicals generated by oxygen metabolism can be discharged in a timely manner. However, the scavenging of KOA patients is inhibited, which could eventually lead to the aging and death of chondrocytes, thereby accelerating their degradation and thus resulting in damage to cartilage. Due to the different effects of western medicine, combining different western medicine could have different efficacy. For example, warm acupuncture in combination with meloxicam can significantly reduce knee joint pain and distension in KOA patients, caused by reduction of inflammatory mediators. Warm acupuncture with western medicine has more significant effect on analgesia. Sun Zhengwen et al. randomly grouped 81 patients who received meloxicam treatment, warm acupuncture treatment, and the combination of both. The authors found that the combined treatment efficiency was 96.30%, compared with 77.78% for western medicine treatment and 81.48% for warm acupuncture alone. The combined treatment was significantly superior to treatment with warm acupuncture and western medicine alone and improve pain and body's motor function problems [14].

4. Multiple Combination treatments based on warm acupuncture

In addition to the combination of warm acupuncture and other single treatment protocols, multiple therapies can be combined to synergistically treat KOA and produce different therapeutic effects.

For example, Tang Yue et al. split 80 patients with hyperplastic knee osteoarthritis into a control and observation groups: the control group received ibuprofen slow-release tablets + Shentong Zhuyu decoction; the observation group received warm acupuncture on top of the control group. The post-treatment results showed that the overall effective rate was higher in the observation group, and the results from two compared groups are vast significantly different ($P<0.05$), and the levels of inflammatory response factors was lower, the results show that warm acupuncture can effectively promote the absorption of inflammation and repair of damaged tissues [15].

In addition, the combination treatment of warm acupuncture can also be based on conventional physical therapy and drug therapy treatments such as oral anti-inflammatory and pain-relieving, chondrocyte-nourishing drug therapy. Appropriate muscle exercises around the knee joint and weight control are done.

Wang Yuande used the random number table method to divide them into observation and control groups, both groups had 50 patients. The control group received conventional methods of treatment, while the observation group received the combination of warm acupuncture and Modified Danggui Sini Decoction on top of the conventional treatment. Following treatment, the observation group's effect and WOMAC score were much higher than those of the other group, and two groups have different results ($P<0.05$). This indicates that the combination of warm acupuncture therapy with addition of Modified Danggui Sini Decoction has certain clinical application and research value [16].

It should be noted that the current studies on warm acupuncture for the treatment of diseases still have some shortcomings: (1) The current literature on the treatment of KOA with warm acupuncture is small and lacks a more specific evaluation of its efficacy. (2) The recurrence rate of KOA is high, but only a small amount of follow-up information is available. (3) There is a certain blindness in treatment, with a bias toward treatment and a disregard for dialectic, and less awareness of the various stages of the disease. (4) Some studies do not follow the single variable principle. (5) Whether the treatment of drugs achieves the principle of safety and convenience, and no detailed investigation of patients' adverse reactions and adaptations was conducted. (6) The evaluation of the efficacy after treatment lacks a good Western medical pathology and imaging basis. Therefore, the above issues need more attention in the follow-up studies.

5. Conclusion

This paper introduces 4 related combination treatments for KOA from warm acupuncture. Warm acupuncture has shown significant improvement in knee motion and pain. Warm acupuncture and moxibustion combined with acupuncture and bloodletting can significantly improve knee joint mobility function and pain in patients with gouty knee osteoarthritis, and the overall efficacy is better. Warm acupuncture combined with traditional Chinese medicine can further improve knee joint function and pain problems in KOA patients. Warm acupuncture combined with western medicine can significantly reduce the oxidative stress of the body and improve pain and body's motor function problems. Warm acupuncture can also be combined with multiple therapies to treat the disease synergistically and might have different therapeutic effects.

The clinical efficacy of different warm acupuncture methods on KOA has been studied., for different the treatment of different types of knee osteoarthritis shows its unique therapeutic effect, and choosing the appropriate warm acupuncture treatment for KOA can achieve twice the result with half the effort in clinical practice, while the coordination method needs to be updated with the advancement of technology and the development of ethnic medicine.

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