Research Article

Therapeutic Value of Traditional Chinese Massage plus Moxibustion for Degenerative Knee Osteoarthritis

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Objective. To evaluate the therapeutic value of traditional Chinese massage plus moxibustion for degenerative knee osteoarthritis (DKOA).

Methods. From January 2019 to October 2021, 152 patients with DKOA were enrolled. All patients were randomly divided into the treatment group and the control group. The control group was treated with oral glucosamine hydrochloride capsules. The treatment group was treated with traditional Chinese massage and moxibustion on the basis of the control group. The duration of treatment in the two groups was 8 weeks. The effectiveness, visual analog scale (VAS) score, the hospital for special surgery (HSS) score, World Health Organization Quality of Life Scale (WHOQOL-BREF) score, serum high-sensitivity C-reactive protein (CRP), and interleukin-6 (IL-6) levels were compared between the two groups before and after treatment.

Results. There were no significant differences in age, sex, and the duration of disease between the two groups ($P > 0.05$). The overall response rate in the treatment group was significantly higher than that of the control group after treatment (92.1% vs 78.9%; $P = 0.038$); the VAS score of both two groups was significantly decreased, and the VAS score in the treatment group was significantly lower than that of the control group ($3.5 \pm 1.4$ vs $4.8 \pm 1.1$; $P < 0.001$); the HSS score and WHOQOL-BREF score significantly improved in both groups, and the HSS score and WHOQOL-BREF score improved more in the treatment group than those of the control group ($P < 0.05$). The high-sensitivity CRP level significantly decreased in both groups, and the high-sensitivity CRP level in treatment group is lower than that of the control group ($2.79 \pm 1.65$ vs $4.37 \pm 1.54$; $P < 0.001$); the IL-6 level was significantly decreased in the treatment group than in the control group ($7.22 \pm 3.41$ vs $4.59 \pm 2.98$; $P < 0.001$). Conclusion. Traditional Chinese massage plus moxibustion is worthy of clinical application, which has a significant clinical effect on DKOA, reducing pain and improving knee joint function and quality of life.

1. Introduction

Degenerative osteoarthritis (DOA) is a common osteoarthritic disease. Degenerative knee arthritis (DKOA) is the most common in DOA, mainly manifested as joint stiffness with limited mobility, persistent pain, or motor pain with numbness [1]. Patients with DKOA have mild initial symptoms, mainly joint stiffness with alleviation after activity, varying degrees of joint swelling and deformation, and limited mobility with significant pain in the later stage of the disease [2]. In general, any damaging factor affecting joint biomechanics causes or aggravates DKOA in addition to age and subsequently leads to clinical symptoms [3]. The knee joint is an important weighing joint of body. The occurrence of DKOA can seriously affect the walking ability and quality of life [4] and may be associated with a subsequent increase in the risk of falls and fractures [5]. There are many clinical treatments for DKOA, including conservative treatment such as oral glucosamine, local injection of sodium hyaluronate, and physical therapy. Nonsteroidal anti-inflammatory drugs and local blocking can be used to relieve local pain and improve joint activity when the pain is obvious [6]. However, the disadvantage of conservative treatment is slow and fair effect, long course, and high cost. It is urgent to find an effective treatment for DKOA. Traditional Chinese massage is a standardized manual therapy which is performed by well-trained TCM medical staff with high safety and is widely accepted by patients [7]. Traditional Chinese medicine (TCM) is the system with the longest history and is gaining popularity in other countries too [8]. Previous studies show...
that traditional Chinese medicine have been used in different 
ethnicities and races [9, 10]. Moxibustion therapy, an important 
way of TCM treatment, is mainly through the heat of 
moxibustion to give warm stimulation and activate meridian 
acupoints, so as to improve the clinical symptoms of patients 
[11]. There are still few studies on traditional Chinese 
medicine combined with moxibustion in the treatment of 
DKOA. In this study, we observed the effectiveness, visual 
analog scale (VAS) score, the hospital for special surgery 
(HSS) score, World Health Organization Quality of Life Scale 
(WHOQOL-BREF) score, serum high-sensitivity C-reactive 
protein (CRP), and interleukin-6 (IL-6) level after treatment 
to evaluate the value of traditional Chinese massage plus 
moxibustion in the treatment of DKOA.

2. Patients and Methods

2.1. Patients. From January 2019 to October 2021, 152 pa-
tients with DKOA were enrolled. Inclusion criteria were as 
follows: (1) ≥18 years old; (2) combined with the clinical 
symptoms, signs, and X-ray and other typical imaging 
findings, in line with the diagnostic criteria of degenerative 
gonarthritis; (3) without surgical treatment, understanding 
the treatment plan, and agreeing to conservative treatment. 
Exclusion criteria were as follows: (1) infectious arthritis, 
rheumatoid arthritis, or traumatic arthritis; (2) serious organ 
dysfunction; (3) blood system diseases or malignant tumors; 
(4) mental disorders or cannot cooperate to complete the 
treatment; (5) other situation which could affect the levels of 
high-sensitivity CRP and IL-6. This study was approved by the 
Ethics Committee of First Affiliated Hospital of Xian Jiaotong 
University. All patients signed informed consent forms.

2.2. Grouping and Treatment. The patients were randomly 
divided into the treatment group and control group. The 
control group was treated with oral glucosamine hydro-
chloride capsules, 0.75 g twice daily (Hong Kong Aussie 
Pharmaceutical Factory) for 8 weeks. On the basis of the 
control group, the treatment group was treated with tradi-
tional Chinese massage plus moxibustion three times a 
week for 8 weeks. 

The treatment plan of traditional Chinese massage plus 
moxibustion was as follows: assist the patient to lie in the 
supine position, place the bolster under the knee, and use a 
rolling massage and a finger-Zen pushing method to treat 
the knee joint and its surroundings; the massage site starts 
from the distal knee joint, and the massage time lasts for 5 
minutes. Then, acupoints such as Zusanli, Yanglingquan, 
Liangqiu, and Xuehai were taken for point pressing, each 
lasting 2 minutes. At the end of the massage, a moxibustion 
box was placed on the affected knee, and moxa sticks were 
placed according to acupoints such as Eryalinglingquan, 
Yinlinglingquan, Xuehai, Liangqiu and internal and external 
kleen eyes, Zusanli and Chengshan, to ignite moxa stick 
fumigation moxibustion for about 30 minutes.

2.3. Outcome Measures. Efficacy was assessed using the 
following outcome measures. (1) Outcomes: markedly 
effective is defined as the basic disappearance of symp-
toms, basically normal joint function, and the ability to 
complete daily life and work; effective is defined as sig-
nificant relief of symptoms, significant improvement of 
joint function, and improvement in the ability to par-
ticipate in activities or work; and ineffective is defined as 
no improvement in symptoms and signs. Overall response 
rate = (markedly effective + effective)/total number of 
cases × 100%. (2) VAS score: the degree of pain was 
assessed using the visual analog scale (VAS) score, ranging 
from 0 to 10 [12]. (3) HSS score: the Hospital for Special 
Surgery (HSS) score was used to evaluate the knee joint 
function [13]. The scale included seven items: pain degree, 
joint function, joint range of motion, etc. (4) WHOQOL-
BREF score: World Health Organization Quality of Life 
Scale (WHOQOL-BREF) was used [14] to evaluate pa-
tient’s quality of life. (5) High-sensitivity CRP and IL-6: 
10 mL fasting venous blood was drawn before and after 
treatment and was placed for 10min and centrifuged to 
obtain the upper serum, and high-sensitivity CRP and IL-6 
levels were measured by ELISA.

2.4. Statistical Analysis. Statistical analysis was performed by 
IBM SPSS 21.0. Categorical variables were expressed as n 
(%), and differences were compared using the chi-square 
test. Continuous variables were expressed as mean ± SD, and 
t-test was used to compare differences. The t-test was used to 
compare the differences in VSS score, HSS score, WHO-
QOL-BREF score, high-sensitivity CRP level, and IL-6 level 
before and after treatment. P < 0.05 was considered to be 
statistically significant.

3. Results

3.1. Clinical Characteristics. As shown in Table 1, a total of 
152 patients with DKOA were included. There are 76 pa-
tients in the treatment group (age: 64.6 ± 9.7 years, male: 46, 
60.5%), and the duration of disease was 2.49 ± 0.82 years. 
There are 76 patients in the treatment group (age: 63.1 ± 8.7 
years, male: 48, 63.2%), and the duration of disease was 
2.31 ± 0.77 years. There were no significant differences in age, 
sex, and duration of disease between the two groups (P > 0.05).

3.2. Treatment Outcomes. As shown in Table 2 and Figure 1, 
the number of markedly effective, effective, and ineffective 
patients in the treatment group was 44, 26, and 6, respec-
tively. The number of markedly effective, effective, and 
ineffective patients in the control group was 32, 28, and 16, 
respectively. The overall response rate in the treatment 
group was significantly higher than that in the control group 
(92.1 vs 78.9%, P = 0.038).

3.3. VAS Score. As shown in Table 3, the VAS score of the 
treatment group showed no significant difference com-
pared to the control group (7.6 ± 1.3 vs 7.8 ± 1.0; P = 0.238) 
before treatment. The VAS score was significantly decreased
in both groups after treatment, and the VAS score in the treatment group was significantly lower than that in the control group (3.5 ± 1.4 vs 4.8 ± 1.1, *P < 0.001).

3.4. HSS Score and WHOQOL-BREF Score. As shown in Table 4, there was no significant difference in the HSS score (41.6 ± 6.7 vs 42.4 ± 7.1, *P = 0.496) and WHOQOL-BREF score (53.8 ± 7.8 vs 55.3 ± 8.4, *P = 0.246) between the two groups before treatment. The HSS score was significantly increased after treatment in both groups, and the HSS score in the treatment group was significantly higher than that in the control group (80.2 ± 6.8 vs 72.1 ± 7.3, *P < 0.001). The WHOQOL-BREF score was significantly increased, and the WHOQOL-BREF score in the treatment group was increased more than that in the control group (65.6 ± 8.9 vs 74.0 ± 8.7, *P < 0.001).

3.5. High-Sensitivity C-Reactive Protein (hs-CRP) and Interleukin-6 (IL-6) Levels. As shown in Table 5, there was no significant difference in the high-sensitivity CRP level (7.8 ± 7.30 vs 10.3 ± 3.36, *P = 0.446) in the treatment group compared to the control group. The high-sensitivity CRP level of both groups decreased significantly after treatment, and the high-sensitivity CRP level in the treatment group was significantly lower than that in the control group (2.79 ± 1.65 vs 4.37 ± 1.54; *P < 0.001). The IL-6 levels significantly decreased in both groups after treatment, and the IL-6 levels in the treatment group was significantly lower than that in the control group (4.59 ± 2.98, *P < 0.001).

4. Discussion

In this study, the patients with traditional Chinese massage plus moxibustion regimen could reduce pain symptoms, improve knee function and quality of life, and reduce the
levels of inflammatory factors such as high-sensitivity CRP and IL-6, and it could effectively treat DKOA. Previous studies suggest that the prevalence of DKOA is between 4.2% and 15.5%, which is associated with age and region [15]. It is estimated that the prevalence of symptomatic gonarthrosis is 8.1% in the Chinese population, which is higher in women than men and in rural areas than towns. The prevalence of gonarthrosis diagnosed by imaging may be 8.1% [4]. Therefore, DKOA is a heavy burden for both society and families. At present, the main mechanism of DKOA may be due to biomechanical factors caused by chondrocyte, extracellular matrix, and subchondral bone anabolic and catabolic imbalance. Age, obesity, occupation, ethnicity, endocrine hormones, and genetic factors are all thought to be associated with the pathogenesis of DKOA [16]. DKOA belongs to the category of “Bi Zheng” according to TCM, which is a disease caused due to evil qi such as wind, cold, dampness, and heat blocking meridians, affecting the movement of qi and blood, resulting in pain, numbness, or the presence of symptoms such as joint movement disorders in joints and muscles [17]. In this study, we improved the metabolism of tissues around the knee joint, reduced intra-articular pressure, and promoted the repair of intra-articular tissues through traditional Chinese massage [18]. Moxibustion can promote blood circulation, release bone and joint adhesions, and regulate joint tension and balance [19]. The combination of the two can effectively treat DKOA.

Notably, this study also found that traditional Chinese massage combined with moxibustion treatment could reduce the levels of inflammatory factors, including high-sensitivity CRP and IL-6. High-sensitivity CRP is a common inflammatory factor that is mainly produced by hepatocytes during the inflammatory response, and the production of high-sensitivity CRP is significantly correlated with the activity of the inflammatory response [20]. It has been suggested that patients with osteoarthritis have mildly elevated high-sensitivity CRP concentrations and the concentration of high-sensitivity CRP is significantly associated with pain and limb movement disorders [21]. IL-6 is also an important inflammatory factor, mainly produced by lymphocytes, and IL-6 and high-sensitivity CRP are involved in the activation of the inflammatory response and play an important role in the development of DKOA [2]. In this study, after treatment with traditional Chinese massage plus moxibustion, the high-sensitivity CRP and IL-6 levels of both groups decreased significantly and the levels in the treatment group were significantly lower than in the control group. We hypothesize that traditional Chinese massage combined with moxibustion may treat DKOA by reducing inflammatory activity and improving the mechanism of inflammatory response [19].

This study has the following limitations: small sample size, short study time, and collection of fewer variables. In summary, the traditional Chinese massage plus moxibustion regimen can significantly improve the pain symptoms and quality of life of patients with DKOA, restore knee function, and reduce high-sensitivity CRP and IL-6 levels, which is worthy of clinical promotion. Future interventional trials with large samples are needed to further validate the effect of traditional Chinese massage plus moxibustion regimen in patients with DKOA.

Data Availability
The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest
The authors declare that they have no conflicts of interest.

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