

# Therapeutic Effect of Acupuncture Combined with Duhuo Jisheng Decoction on Knee Osteoarthritis and Its Degree of Pain and Inflammatory Factors

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## Abstract

**OBJECTIVE:** To treat patients with knee osteoarthritis (KOA) with acupuncture combined with Duhuo Jisheng Decoction, and to analyze the effect of the combined method on KOA patients and the effect on pain level and inflammatory factors. **METHODS:** Ninety-five patients with KOA admitted to our hospital from August 2016 to September 2018 were selected as the main subjects and were clinically diagnosed. Patients were divided into a combination group (n=47, using Duhuo parasitic soup + acupuncture) and a control group (n=48, conventional western medicine) according to the random number table method; joint pain degree, swelling index and inflammatory response factor before and after treatment. The level of change was recorded, and the total effective rate and adverse reactions of the two groups were recorded. **RESULTS:** The total effective rate was 93.62% in the combined group and 75.00% in the control group. The difference was statistically significant ( $P < 0.05$ ). After treatment, the pain level, swelling index and inflammatory factor level were significantly lower in the two groups. Before treatment, the difference was statistically significant ( $P < 0.01$ ); and the joint group had a pain degree of  $(2.31 \pm 0.26)$  points and a swelling index of  $(0.29 \pm 0.07)$ , which were significantly lower than the control group [ $(5.24 \pm 0.38)$  points,  $(0.67 \pm 0.13)$ ], the difference was statistically significant ( $P < 0.01$ ); the combined group TNF- $\alpha$  was  $(4.28 \pm 1.07)$  pg/mL, IL-1 was  $(167.65 \pm 42.84)$  pg/mL,  $(2.06 \pm 0.62)$  ng/L and IL-1 $\beta$  were  $(1.46 \pm 0.39)$  mg/L, which were significantly lower than the control group [ $(8.05 \pm 1.86)$  pg/mL,  $(234.81 \pm 63.41)$  ng/L,  $(3.52 \pm 1.07)$  ng./L,  $(3.18 \pm 1.03)$  mg/L], the difference was statistically significant ( $P < 0.01$ ); the incidence of adverse reactions in the combined group was 4.26%, which was significantly lower than that in the control group (21.28%). The difference was statistically significant ( $P < 0.05$ ). **Conclusion:** Duhuo Jisheng Decoction combined with acupuncture can significantly improve the degree of joint pain in KOA patients, effectively reduce the level of inflammatory factors and improve the therapeutic effect. It has important guiding significance for clinical treatment of KOA.

**Keywords:** acupuncture; arthritis; knee bone; Duhuo parasitic soup; pain degree; inflammatory factor

## 1. INTRODUCTION

Osteoarthritis (KOA) is a chronic disease common in the elderly. The main symptoms are knee pain [1-2]. At present, Western medicine is often used to treat KOA, but the curative effect is

not good [3]. KOA belongs to the category of "bone sputum" in Chinese medicine. The treatment should be based on tonifying qi and kidney. It has been confirmed [4] that: Duhuo parasitic soup can achieve better curative effect in treating KOA. In recent years, studies have also found that the inflammatory factor  $\gamma$  is related to the deep development of KOA. Based on this, this study used traditional Chinese medicine and western medicine for patients with KOA. The effects of the two treatments on KOA and the clinical symptoms and inflammatory factors were analyzed. The results are reported below.

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## 2. Materials and Method

### 2.1 General Information

95 patients with KOA who were treated in our hospital from August to February 2018 were all in compliance with the diagnostic criteria for KOA in the Chinese Medical Association Rheumatology Group Clinical Guidelines. According to the random number table method, the combination group (n=47) and the control group (n=48) were not statistically significant ( $P>0.05$ , Table 1). Inclusion

criteria: ① In accordance with the "Guidelines for Clinical Research of New Drugs in Traditional Chinese Medicine" (hereinafter referred to as "principles") [6], the criteria for syndrome differentiation; ② age 43 to 78 years; ③ patients have signed informed consent. Exclusion criteria: ① previous treatment for KOA; ② for those with a history of drug allergy; ③ with heart, liver, kidney and other organ diseases and other diseases affecting the results of the study.

Table 1. Comparison of General Data between the Two Groups (eg,  $x\pm s$ )

| Group                   | Number of cases | Male/Female | Age(years) | Course of disease (year) |
|-------------------------|-----------------|-------------|------------|--------------------------|
| Joint group             | 47              | 32/15       | 60.4±8.6   | 2.7±0.8                  |
| Control group           | 48              | 34/14       | 59.8±8.3   | 2.8±0.6                  |
| X <sup>2</sup> /t value |                 | 0.085       | 0.346      | 0.69                     |
| P value                 |                 | 0.771       | 0.73       | 0.492                    |

### 2.2 Treatment Method

1) In the control group, 75 mg diclofenac sodium sustained-release tablets were orally administered once a day (Zhijunpingshan Co., Ltd., National Pharmaceutical Group, H10970209). (2) The combined group was treated with acupuncture and moxibustion combined with Duhuo Jisheng Decoction. Acupuncture and moxibustion: Acupoint Ashi, Xuehai, Liangqiu, Yanglingquan, etc. The patient took supine position and routinely disinfected the skin of acupoints with 0.30 mm x 40 mm Huatuo stainless steel filiform needle. The needling direction was perpendicular to the side of the patient. The needle was retained for 30 minutes after getting Qi through the flat reinforcing and relieving method. Duhuo parasitic decoction: Duhuo and Sangshi 10 g, Eucommia ulmoides, Codonopsis pilosula, Achyranthes bidentata 12 g, Angelica sinensis, Poria cocos, Gentiana, Paeoniae Alba Radix Rehmanniae, Cinnamomi 6 g, Asarum and Licorice 3 g, decocted with water, 1 dose a day, extracting 400 mL of juice, two warm clothes in the morning and evening, 8 weeks as a course of treatment.

### 2.3 Observation Index

(1) Before and after treatment, fasting in the morning, taking 4m L of venous blood, placed in a test tube (without anticoagulant), centrifuged, separated serum, frozen at -20 °C to be tested, and detected necrotizing necrosis of inflammatory factors by ELISA method Factor- $\alpha$  (TNF- $\alpha$ ), interleukin-6, 1, 1 $\beta$  (IL-6, IL-1, IL-1 $\beta$ ) changes. (2) Degree of joint pain: Before and after treatment, the pain visual analogue scale (VAS) [7] was used to evaluate the degree of joint pain, a total of 10 points. The higher the score, the more severe the

pain. (3) Joint swelling index: no swelling of the joint is "0", soft tissue swelling is "1", and soft tissue swelling is accompanied by joint effusion count as "2" [8]. (4) Observed adverse reactions in both groups.

### 2.4 Evaluation Criteria

(1) Efficacy evaluation criteria According to the "Principles" [6], joint activity is normal, X-ray shows normal for clinical control; joint activity has not been limited, X-ray shows that the disease is significantly improved, there is a slight limitation of marked joint activity. The X-ray showed that the disease was improved, the joint activity was not improved, and the X-ray showed no change in the disease.

### 2.5 Statistical Analysis

Using SPSS22.0 software, the measurement data was expressed by  $x\pm s$ , the t test was performed, the count data was expressed by n(%), and the X<sup>2</sup> test was performed;  $P<0.05$  showed that the difference was statistically significant.

## 3. Results

### 3.1 Comparison of Treatment Effects between the Two Groups

The total effective rate after treatment in the combined group was significantly higher than that in the control group, and the difference was statistically significant ( $P<0.05$ ). See Table 2 for details.

### 3.2 Comparison of Clinical sSymptoms between the Two Groups before and after Treatment

Compared with before treatment, the pain score and swelling index of the two groups were

significantly lower after treatment ( $P<0.01$ ). The pain degree and swelling index of the combined group were significantly lower than the control

group after treatment. Learning significance ( $P<0.01$ ); see Table 3 for details.

Table 2. Comparison of Treatment Effects between the Two Groups (n, %)

| Group                | Number of cases | Clinical control (%) | Significant effect (%) | Effective(%) | Invalid(%) | Total efficiency |
|----------------------|-----------------|----------------------|------------------------|--------------|------------|------------------|
| Joint group          | 47              | 15(31.91)            | 21(44.68)              | 8(17.02)     | 3(6.38)    | 44(93.62)        |
| Control group        | 48              | 8(16.67)             | 18(37.5)               | 10(20.83)    | 12(25.00)  | 36(75.00)        |
| X <sup>2</sup> value |                 |                      |                        | 6.19         |            |                  |
| P value              |                 |                      |                        | 0.13         |            |                  |

Table 3. Comparison of Clinical Symptoms before and after Treatment in Both Groups (x±s)

| Group         | Number of cases  | Degree of pain | Swelling index          |
|---------------|------------------|----------------|-------------------------|
| Joint group   | Before treatment | 47             | 7.63±0.85               |
|               | After treatment  | 47             | 2.31±0.26 <sup>①②</sup> |
| Control group | Before treatment | 48             | 7.68±0.82               |
|               | After treatment  | 48             | 5.24±0.38 <sup>①</sup>  |

Note: Compared with before treatment, <sup>①</sup> $P<0.01$ ; compared with the control group, <sup>②</sup> $P<0.01$

### 3.3 Changes in Inflammatory Factors before and after Treatment in Both Groups

Compared with before treatment, the levels of inflammatory factors were significantly lower in the two groups after treatment ( $P<0.01$ ). After

treatment, the levels of inflammatory factors in the combined group were significantly higher than those in the control group. Learning significance ( $P<0.01$ ); see Table 4 for details.

Table 4. Changes in Inflammatory Factor Levels before and after Treatment in Both Groups (x±s)

| Group         | Number of cases  | TNF- $\alpha$ (pg/mL) | IL-1(pg/mL)             | IL-6(ng/L)                 | IL-1 $\beta$ (mg/L)     |                         |
|---------------|------------------|-----------------------|-------------------------|----------------------------|-------------------------|-------------------------|
| Joint group   | Before treatment | 47                    | 8.72±2.09               | 246.72±54.29               | 3.68±1.19               | 3.45±1.12               |
|               | After treatment  | 48                    | 4.28±1.07 <sup>①②</sup> | 167.65±42.84 <sup>①②</sup> | 2.06±0.62 <sup>①②</sup> | 1.46±0.39 <sup>①②</sup> |
| Control group | Before treatment | 47                    | 8.81±2.13               | 250.36±52.37               | 3.74±1.23               | 3.47±1.15               |
|               | After treatment  | 48                    | 8.05±1.86 <sup>①</sup>  | 234.81±63.41 <sup>①</sup>  | 3.52±1.07 <sup>①</sup>  | 3.18±1.03 <sup>①</sup>  |

Note: Compared with before treatment, <sup>①</sup> $P<0.01$ ; compared with the control group, <sup>②</sup> $P<0.01$

### 3.4 Comparison of Adverse Reactions between the Two Groups

The incidence of adverse reactions in the combined group was 4.26% (2/47), and 2 patients developed sleepiness. The incidence of adverse reactions in the control group was 21.28% (10/47), which were mild dizziness, lethargy, and nausea. 1 case of abdominal distension. There was a statistically significant difference in the incidence of adverse reactions between the two groups ( $X^2=6.114$ ,  $P=0.013$ ).

## 4. Discussion

KOA belongs to the category of "bone sputum" of traditional Chinese medicine, and Chinese medicine believes that the pathogenesis of the disease is liver and kidney deficiency, the bones and bones lose nutrients, and the wind and cold and dampness are easy to invade. The treatment should be based on Bugan Yishen and Qushitong.<sup>[9-10]</sup> Duhuosheng parasitic soup has the effect of phlegm

and dampness and sedative pain; mulberry parasitic and Eucommia ulmoides have the functions of nourishing liver and kidney and strengthening bones and muscles; Codonopsis has the effect of replenishing spleen and replenishing qi; Chuanniu and Angelica have the effect of regulating blood and passing through meridians. Poria cocos has the effect of dehumidifying and spleen; Qin dynasty has the effect of removing moist dryness and Shutong collateral; white peony has the effect of concentrating yin and yang; rehmannia glutinosa and cinnamon have the effect of enriching blood and promoting blood circulation; The effect; licorice can be adjusted with various medicines, various medicines, a total of playing the role of Bugan Yishen, Huoxue Tongluo<sup>[11]</sup>. With the acupuncture points (blood sea, Liangqiu, Yanglingquan), it plays the role of warming the meridians and regulating yang. The results of this study showed that the total effective rate of the combined group was 93.62% significantly higher

than that of the control group (75.00%) ( $P < 0.05$ ), and the pain degree and swelling index of the combined group were significantly lower than the control group ( $P < 0.01$ ); The domestic research results<sup>[12]</sup> are basically the same. It is suggested that the combination of Duhuo parasitic soup and acupuncture treatment of KOA is significantly better than Western medicine, and the combination of Chinese medicine can relieve joint pain and swelling. Modern pharmacological research indicates that Fangzhong alone can improve intra-arterial stagnation, and *Achyranthes bidentata* can promote the proliferation of chondrocytes and accelerate the repair of KOA soft tissue; *Angelica* can inhibit nerve and its surrounding ligaments, reduce bone and joint pain and swelling<sup>[13-14]</sup>.

Recent studies<sup>[15]</sup> reported that the incidence of KOA may be related to a variety of inflammatory factors. TNF- $\alpha$  can directly inhibit the synthesis of cartilage collagen, damage the cartilage matrix, and cause cartilage damage. IL-6 can prevent the synthesis of articular cartilage glycoprotein in the body, promote matrix degradation, and thus play a role in the damage of cartilage mechanism<sup>[16]</sup>. Inflammatory factor IL-1 is a lymphocyte activating factor. Previous studies<sup>[17-18]</sup> also pointed out that inflammatory factors such as TNF- $\alpha$  and IL-1 are closely related to the occurrence and development of osteoarthritis. Therefore, effective inhibition of local inflammation of the knee bone may be important for the treatment of KOA. The results of this study showed that the levels of inflammatory factors such as TNF- $\alpha$ , IL-6, IL-1 and IL-1 $\beta$  were significantly higher in the two groups than before treatment ( $P < 0.01$ ), but the levels of inflammatory factors in the combined group were significantly lower. In the control group ( $P < 0.01$ ). Domestic research<sup>[7,19]</sup> has reported that: Duhuo parasitic soup can inhibit TNF- $\alpha$ , IL-1 $\beta$ , IL-6 levels. Tip: Although both Chinese medicine and Western medicine can reduce the level of inflammatory factors, combination therapy has a better inhibitory effect on inflammatory factor levels in KOA patients. The reason may be: Duhuo parasitic soup has anti-inflammatory and analgesic effects, increasing vascular permeability and regulating immunity<sup>[11]</sup>. Coupled with local acupuncture and acupoints, not only can regulate blood and nourish blood, relieve phlegm, but also stimulate the acupuncture points to improve blood circulation and eliminate inflammation. The results of this study also showed that the incidence of adverse reactions in the combined group was significantly lower than that in the control group ( $P < 0.01$ ). It is

confirmed that the safety of Chinese medicine combined treatment is stronger than that of western medicine.

## 5. CONCLUSION

In summary, Duhuo parasitic soup + acupuncture can not only effectively improve the degree of joint pain in KOA patients, but also relieve the inflammatory reaction in patients, improve the therapeutic effect, and high safety, which can provide a new direction for clinical treatment of KOA.

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