

# EFFECT OF CHINESE MEDICINE ON MUSCLE FATIGUE OF ATHLETES



ORIGINAL ARTICLE  
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O EFEITO DA MEDICINA CHINESA NA FADIGA MUSCULAR DE ATLETAS

EL EFECTO DE LA MEDICINA CHINA EN LA FATIGA MUSCULAR DE ATLETAS

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## ABSTRACT

**Introduction:** Traditional Chinese medicine has a very good effect on the treatment of exercise fatigue. However, if it is not handled actively and effectively, it can cause serious adverse effects on the body and lead to many diseases. **Objective:** To study the effect of TCM diagnosis and treatment on athletes' exercise-induced muscle fatigue. **Methods:** The results of the study were analyzed by comparing the experimental data in the experimental group and the control group. **Results:** A paired t test was conducted on the experimental results of the experimental intervention group and the data of the control group. It was found that regardless of individuals being male or female, the paired t test results of the experimental group and the data of the control group were all  $P < 0.05$ , showing significant differences in the paired data. **Conclusions:** In the experiment, all the treatment methods of traditional Chinese medicine had an obvious effect in the treatment of exercise fatigue, and reduced the recovery time of exercise fatigue at different degrees. Contrastive analysis shows that traditional Chinese medicine is effective in the treatment of exercise fatigue. **Level of evidence II; Therapeutic studies - investigation of treatment results.**

**Keywords:** Acupuncture therapy; Therapeutics; Athletic injuries.

## RESUMO

**Introdução:** A medicina tradicional chinesa é muito eficaz no tratamento de fadiga por exercícios. No entanto, se não for manejada de forma ativa e eficaz, pode causar sérios efeitos adversos no corpo e levar a muitas doenças. **Objetivo:** Estudar o efeito do diagnóstico e tratamento da MTC na fadiga muscular causada pelo exercício em atletas. **Métodos:** Os resultados do estudo foram analisados comparando os dados experimentais de um grupo experimental e um de controle. **Resultados:** O teste t pareado foi realizado nos resultados experimentais do grupo de intervenção experimental e os dados do grupo de controle. Foi verificado que, independentemente do sexo dos indivíduos, os resultados do teste t pareado do grupo experimental e os dados do grupo de controle eram todos  $P < 0,05$ , o que demonstra diferenças significativas entre os dados pareados. **Conclusões:** No experimento, todos os métodos da medicina tradicional chinesa tiveram efeitos evidentes no tratamento da fadiga por exercícios e podem reduzir o tempo de recuperação da fadiga causada por exercícios em graus variados. A análise contrastiva mostra que a medicina tradicional chinesa é eficaz no tratamento de fadiga por exercícios. **Nível de evidência II; Estudos terapêuticos – investigação de resultados de tratamento.**

**Descritores:** Terapia de acupuntura; Terapêutica; Lesões de atletas.

## RESUMEN

**Introducción:** La medicina tradicional china es muy eficaz en el tratamiento de fatiga por ejercicios. Sin embargo, si no se la maneja de forma activa y eficaz, puede ocasionar serios efectos adversos en el cuerpo y conllevar varias enfermedades. **Objetivo:** Estudiar el efecto del diagnóstico y tratamiento de la MTC en la fatiga muscular causada por ejercicio en atletas. **Métodos:** Los resultados del estudio se analizaron comparando los datos experimentales de un grupo experimental y uno de control. **Resultados:** La prueba t pareada se realizó en los resultados experimentales del grupo de intervención experimental y los datos del grupo de control. Se verificó que, independientemente del sexo de los individuos, los resultados de la prueba t pareada en el grupo experimental y los datos del grupo de control eran todos  $P < 0,05$ , lo que demuestra diferencias significativas entre los datos pareados. **Conclusiones:** En el experimento, todos los métodos de la medicina tradicional china obtuvieron efectos evidentes en el tratamiento de la fatiga por ejercicios y pueden reducir el tiempo de recuperación de la fatiga causada por ejercicios en variados grados. El análisis contrastivo muestra que la medicina tradicional china es eficaz en el tratamiento de fatiga por ejercicios. **Nivel de evidencia II; Estudios terapéuticos – investigación de resultados de tratamiento.**

**Descritores:** Terapia de acupuntura; Terapêutica; Lesiones de atletas.



## INTRODUCTION

Traditional Chinese medicine has long recognized that fatigue is the so-called "overwork", including overwork and overexertion, and the formation of exercise fatigue is mainly due to hard work, the loss of essence, qi and spirit, the imbalance of human meridians, viscera, qi and blood, and Yin and Yang, finally leads to the comprehensive result of multiple factors of weakness.<sup>1,2</sup> On the basis of the current research, this paper proposes to analyze the research results by comparing the experimental data of the experimental group and the control group through the related experiment of exercising human beings. Paired t test was conducted on the experimental results of each experimental intervention group and the data of the control group, and it was found that no matter for men or women, the paired t test results of each experimental group and the data of the control group were all  $P < 0.05$ , showing significant differences in the paired data. To prove that the treatment of traditional Chinese medicine on athletes sports muscle fatigue effect is lower than modern means of traditional Chinese medicine.<sup>3</sup>

## METHOD

### Experimental subjects

30 students were selected (after load intervention) with similar exercise habits and ages (boys were selected from badminton special class and girls were selected from aerobics special class), there were 15 males and 15 females, aged between 18 and 25. The massage intervention group, Chinese medicine intervention group, moxibustion intervention group and intervention group were set up with 5 boys and 5 girls in each group. (See the preparation section for experiment for the grouping principle.) The basic information is shown in Table 1.<sup>4</sup>

### Experimental method

A group of experimental sample groups were selected, and the body reached the target fatigue state through exerting exercise load. Then the samples were grouped, and the massage intervention group, Chinese medicine intervention group, acupuncture intervention group and control group were set up, and the efficacy was recorded. The posterior thigh muscle group, which is more prone to fatigue in middle and long distance running, was selected for study.<sup>5</sup>

1. Massage intervention group used massage to intervene on the test samples in this group, pressing Chengshan, Weizhong, Xuehai and Liangqiu acupoints for 1min each, the purpose is to activate the meridians, as a preparation for the manipulation of massage intervention therapy, then mainly with the finger, palm, elbow and other parts of the fatigue part, the strength from light to heavy, the force from shallow to deep gradually press the back side of the thigh muscle group or acupoints, when it reaches the level of action, it will stay for about 10 ~ 30s, and then slowly relax from heavy to light, which can be repeated many times.
2. Chinese medicine intervention group This group used saffron and notoginseng Chinese medicine prepared medicine wine for external

application and massage to conduct experimental intervention on the test samples, it mainly used rubbing, rubbing and pressing to promote the absorption of the drug effect. After 5 minutes of basic massage, the electrode of J48A computer medium frequency (diathermic) therapeutic instrument was placed on the back of the thigh .

### 3. Moxibustion intervention group

The moxibustion box was fixed on the back of the thigh. The temperature of the moxibustion box was measured according to the tolerance of the test sample students. The duration was 30 minutes, once a day, and the subjective feelings of the patients were recorded.

### 4. Control group

The control group did daily living activities, diet; work and rest requirements as much as possible consistent with other experimental groups. Subjective feelings of patients were recorded every day.<sup>6</sup>

## RESULTS

Exercise fatigue is the inevitable reaction of exercise training or physical exercise, the human organism movement to a certain load of labor is an important sign to check the training effect, and there is no fatigue no training concept. Generally speaking, after fatigue occurs, if it is mild fatigue, the body will recover quickly; Moderate fatigue requires reasonable adjustment of load and adaptation to rest, and severe fatigue in order to make the body's physiological indicators as soon as possible to restore to the original level or to achieve excessive recovery, it is necessary to adopt appropriate methods to eliminate exercise fatigue. According to the current research, the methods to eliminate exercise fatigue generally include the means of traditional Chinese medicine, scientific arrangement of training cycles, effective physical therapy, appropriate psychological regulation, adequate sleep, nutrition regulation, etc. . Among them, traditional Chinese medicine is the most widely used method, and the basic concept of traditional Chinese medicine in the treatment of exercise fatigue can be summarized as four aspects: tonifying spleen and replenishing qi, tonifying kidney and nourishing Yin, activating blood and benefiting water, and regulating liver and regulating qi.<sup>7</sup>

Massage is a traditional therapy guided by the theory of traditional Chinese medicine and based on the theory of meridian and tendons and the theory of meridian and meridian points. Massage is based on the theory of traditional Chinese medicine, combined with health science, modern medicine, sports biomechanics and other disciplines, with the doctor through specific, skilled techniques and skills on the human body acupoints or parts, it has the characteristics of good effect and high safety, and has a wide range of adaptability to diseases, especially in the treatment of sports fatigue and sports injury.

As shown in Table 2, the paired sample t test was conducted between the massage intervention group, the Chinese medicine intervention group, the moxibustion intervention group and the control group for the factor of sample height, the results of each paired analysis were all

**Table 1.** Basic information of motion fatigue test samples.

Project Group	Gender	n	The average weight	Average height	The average age	Movement age	Sports
Massage intervention group	Man	5	72	174	22	3	Badminton
Chinese medicine intervention group	Man	5	72.3	173	22.5	3.2	Badminton
Moxibustion intervention group	Man	5	74	174.5	23	3.5	Badminton
The control group	Man	5	70	173	22	3.2	Badminton
Massage intervention group	Woman	5	58.6	165	22	3.5	Aerobics
Chinese medicine intervention group	Woman	5	58.5	166	21	3.6	Aerobics
Moxibustion intervention group	Woman	5	56.3	164	22.5	3.2	Aerobics
The control group	Woman	5	55.6	164.5	22	3.3	Aerobics

**Table 2.** Paired sample t test of motion fatigue test sample height.

	The mean	The standard deviation	The lower limit	Ceiling
Massage intervention group man-The control group	800	1.924	-1.587	3.189
Chinese medicine intervention group man-The control group	200	1.634	-1.850	2.240
Moxibustion intervention group man-The control group	1000	1.451	-756	2.756
Massage intervention group woman-The control group	600	1.673	-1.478	2.687
Chinese medicine intervention group woman-The control group	200	8.27	-839	1.239
Moxibustion intervention group woman-The control group	200	8.37	-1.234	839

$P > 0.05$ , indicating that there was no significant difference between and within the selected samples in terms of height factors of the massage intervention group, the Chinese medicine intervention group, the moxibustion intervention group, and the basic conditions.<sup>8</sup>

## DISCUSSION

As shown in Table 3, the paired sample t test was conducted between the massage intervention group, the Chinese medicine intervention group, the moxibustion intervention group, the acupuncture intervention group and the electroacupuncture intervention group and the control group respectively for weight factors, the results of each paired analysis were all  $P > 0.05$ , indicating that there was no significant difference between or within the selected samples in terms of weight factors of the massage intervention group, Chinese medicine intervention group, moxibustion intervention group and control group in the basic information of samples.<sup>9</sup>

As shown in Table 4, the paired sample t test was conducted between the massage intervention group, the Chinese medicine intervention group, the moxibustion intervention group and the control group, respectively, as a factor of sample age, and the results of the paired analysis were all  $P > 0.05$ , it indicates that there is no significant difference in the basic conditions of samples of the massage intervention group, the Chinese medicine intervention group, the moxibustion intervention group, the acupuncture intervention group and the electroacupuncture intervention group in terms of age.<sup>10</sup>

## CONCLUSION

It is proposed to study the influence of TCM diagnosis and treatment technology on athletes' exercise-induced muscle fatigue. The massage intervention group was used to intervene the samples by massage. The Chinese medicine intervention group used saffron and notoginseng Chinese medicine to make medicine wine for external application and massage to test samples for experimental intervention; The moxibustion intervention group is to use moxibustion on the body surface or acupoints, with warm stimulation, through the role of meridians, to intervene on the sample; To adjust the physiological imbalance of the body, to

**Table 3.** Paired sample t test of exercise fatigue test sample weight.

	The mean	The standard deviation	The lower limit	Ceiling
Massage intervention group man-The control group	1.200	2.049	-1.345	3.745
Chinese medicine intervention group man-The control group	1.600	2.191	-1.120	4.320
Moxibustion intervention group man-The control group	2.400	1.4512.302	-459	5.259
Massage intervention group woman-The control group	3.600	4.561	-2.063	9.263
Chinese medicine intervention group woman-The control group	3.800	2.950	-138	7.462
Moxibustion intervention group woman-The control group	1.400	1.140	-016	2.816

**Table 4.** Paired sample t test of sports fatigue test sample age.

	The mean	The standard deviation	The lower limit	Ceiling
Massage intervention group man-The control group	400	548	-1.080	280
Chinese medicine intervention group man-The control group	200	447	-755	355
Moxibustion intervention group man-The control group	600	548	-080	1.280
Massage intervention group woman-The control group	200	837	-1.239	839
Chinese medicine intervention group woman-The control group	200	837	-1.239	839
Moxibustion intervention group woman-The control group	200	447	-755	355

warm the meridians, health care, strong body, treatment and health care. Modern Chinese medicine in the treatment of sports fatigue and sports injury of the comprehensive therapy can achieve the best effect, such as acupuncture, massage, cupping, micro current, electromagnetic wave lamp, ultra-short wave therapy equipment, such as orderly combination of treatment of sports fatigue and sports injury can achieve a very significant therapeutic effect. For example, electroacupuncture is the most effective treatment of modern Chinese medicine in the experiment. It takes only 1 to 2 days to treat moderate exercise fatigue and only 3 to 4 days to treat sports injuries. Therefore, in the trial of Chinese medicine treatment methods in the treatment of exercise fatigue have obvious effect, can shorten the required recovery time of exercise fatigue in different degrees. Contrastive analysis shows that traditional Chinese medicine is effective in the treatment of exercise fatigue.

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