

Acupuncture Combined with Rehabilitation Training in the Treatment of Limb Spasm after Stroke

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Abstract

The purpose of this study is to explore the effect of acupuncture combined with rehabilitation training in the treatment of limb spasm after stroke. To provide research direction and theoretical basis for the next step to carry out the research on the treatment of limb spasm after stroke. A total of 232 stroke patients were randomly divided into experimental group (AC) 116 cases and control group (CON) 116 cases. Fugl Meyer was used to evaluate motor function, Barthel was used to evaluate activities of daily living, NIHSS was used to evaluate neurological deficit. Multivariate logistic regression analysis was used to explore the treatment effect of stroke patients. The motor function, neurological deficit and activities of daily living of patients in AC group recovered well, and there was no difference in the incidence of adverse reactions between the two groups. Acupuncture combined with rehabilitation training can better cure post-stroke limb spasticity, and provide research direction and theoretical basis for the next step in the research of related treatment methods of post-stroke limb spasticity.

Keywords: stroke; acupuncture; rehabilitation training; limb spasm; patients

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Introduction

Stroke is a kind of cerebrovascular disease, which is called stroke in traditional Chinese medicine. In recent 10 years, with the acceleration of the aging of Chinese population, the number of patients has gradually increased, which has become one of the factors threatening the old people's later life [1]. Stroke has a very high mortality and disability rate, the recovery cycle of prognosis also takes a long

time, and the cost of the whole treatment process is also very expensive. The highest incidence of complications after stroke is body spasm, patients with lower limb, upper limb movement is severely limited, loss of strength, some serious patients cannot walk or stand normally, and even severe deformities [2]. At present, there are two main clinical treatments for stroke patients. One is the use of tizanidine and dipyradasone, which can inhibit the sudden spasm of muscle tension, reduce the resistance in the process of passive movement, and enhance the intensity of random movement. However, the side effects of the treatment are also very obvious, such as drowsiness, hypotension, fatigue and pruritus. Because the disease is mostly elderly patients, there are many basic diseases, and the scope of drug application is narrow [3]. The second is the use of rehabilitation training therapy, mainly according to the patients' motor dysfunction, neurological dysfunction, language disorders and other related diseases, using the Electroacupuncture of rehabilitation center to stimulate the patients' nerves, muscles and related acupoints, to alleviate the symptoms of muscle spasm [4]. Because the rehabilitation training can only be carried out in the rehabilitation center, the limited location limits the promotion of the therapy. Moreover, the effect of rehabilitation training alone is slow, and the treatment process is long, which leads to that rehabilitation training is not widely used.

In recent years, Chinese medicine has carried out a lot of stroke treatment research, and developed the use of acupuncture intervention. Acupuncture and moxibustion can directly act on the lesions of patients, directly reduce vascular resistance through stimulation, increase blood flow, bring oxygen and nutrition through blood, and complete the repair of diseased tissues [5]. Studies have shown that stroke sequelae patients treated with acupuncture, the results show that patients with motor function and related symptoms improved significantly [6]. There are also research results show that acupuncture can not only improve the upper limit after healing, but also shorten the overall treatment process after healing. Due to the lack of research and clinical application of acupuncture treatment at this stage, its specific efficacy needs to be further confirmed.

In order to further explore the better treatment of limb spasm after stroke, we used acupuncture combined with rehabilitation training to intervene the patients. By evaluating the motor function, activities of daily living, neurological deficit and the incidence of adverse reactions of the patients, Objective to investigate the clinical effect and prognosis of acupuncture combined with rehabilitation training on limb spasm after stroke, To provide research direction and theoretical basis for the next step to carry out the research on the treatment of limb spasm after stroke.

Methods

This is a randomized controlled clinical trial in the First Affiliated Hospital of Guangzhou University of Chinese Medicine. This study has been approved by the Ethics Committee of the First Affiliated Hospital of Guangzhou University of Chinese Medicine. All patients signed the written informed consent. The included patients met the following inclusion and exclusion criteria. Inclusion criteria:

- (1) The patient was diagnosed as stroke by CT examination and two experienced doctors
- (2) Patients with first stroke
- (3) They can communicate normally and express their wishes clearly
- (4) The onset time was less than 3 days.

Exclusion criteria:

- (1) Received the related drugs involved in this study within 1 month;
- (2) Expression disorder or mental illness;

(3) Patients with allergic constitution or acupuncture intolerance;

(4) Suffering from severe liver and kidney diseases.

Grouping of patients

We randomly divided 232 patients with cerebral hemorrhage into experimental group (AC) and control group (CON), 116 patients in each group.

Clinical monitoring index

The medical reports of all patients were evaluated to confirm the presence of intracerebral hemorrhage. General baseline data were recorded, including age, body mass index (BMI), gender, drinking, smoking, blood glucose, blood pressure and family history.

Motor function evaluation

The motor function was evaluated by Fugl Meyer assessment (FMA). The specific improvement of motor function before and after treatment and during the follow-up period. The degree of spasm was determined by three doctors randomly selected from the doctor database who did not know the experimental grouping. The average value of the three groups was the final score. The degree of spasm was divided into five grades of 0-4. The more severe the spasm, the higher the grade [7].

Assessment of activities of daily living

Barthel Index (BI) was used to evaluate activities of daily living (ADL), including eating, dressing, decorating and bathing. The highest score was 100. The higher the score, the better the situation [8].

Evaluation of neurological deficit

NIHSS score was used to evaluate the neurological deficit. Compared with the initial score before treatment, when the score decreased by more than 95% after treatment, the patient was considered to have recovered and returned to normal state; when the score was between 70-95%, the curative effect was significant; when the score was between 30-70%, there was partial effect; when the score was less than 30%, there was no effect at all [9]. Effective rate = patients with score more than 30% / total number of patients * 100%;

Adverse reaction evaluation

Comparison of the number of adverse events in the two groups: the number of adverse events such as cardiovascular disease, cerebrovascular disease and severe muscle spasm in the two groups were statistically analyzed.

Statistical analysis

In this paper, SPSS 19.0 software package was used to compare and analyze the data between groups. The measurement data between groups were compared by t-test of two independent samples. $P < 0.05$ was considered statistically significant.

Results

General baseline information

By comparing the age, gender, smoking, drinking, blood pressure, complications and blood biochemical indexes of AC and con groups, we found that there was no significant difference between AC and con groups, and the two groups were comparable (all $P > 0.05$) (**Table 1**).

Comparison of motor function evaluation results

The results of Fugl Meyer assessment (FMA) showed that the ah score of AC was significantly higher than that of con ($P > 0.05$, **Figure 1**).

Comparison of activities of daily living evaluation results

The Bi scale evaluation results showed that the Bi scale score of AC was significantly higher than that of con ($P > 0.05$, **Figure 2**).

Comparison of evaluation results of neurological deficit

NIHSS evaluation results showed that compared with AC and con, NIHSS score decreased more, and the difference between groups was statistically significant ($P > 0.05$, **Figure 3**).

Comparison of adverse reaction evaluation results

The results showed that the incidence of cardiovascular disease in patients with AC was significantly lower than that in patients with con ($P > 0.05$, **Figure 4**).

The results showed that the incidence of cerebrovascular disease in patients with AC was significantly lower than that in patients with con ($P > 0.05$, **Figure 5**).

The incidence of severe muscle spasm in patients with AC was significantly lower than that in con ($P > 0.05$, **Figure 6**).

Discussion

In this study, after analyzing the motor function, activities of daily living, neurological deficit and the incidence of adverse reactions, we found that compared with con group, the FMA score of motor function in AC group was significantly higher, the Bi score of activities of daily living was significantly higher, the NIHSS score decreased more, and the incidence of adverse reactions was lower. Therefore, in the treatment of stroke patients with limb spasm, motor function, activities of daily living, neurological deficits and the incidence of adverse reactions can be used as independent evaluation indicators to test the efficacy of patients [10].

Acupuncture treatment mainly stimulates the relevant acupoints of the human body, promotes the vein of the body to maintain a smooth state, promotes blood circulation, and is beneficial to the recovery of the limb motor function of patients, so as to achieve effective treatment of diseases [11]. Previous studies have found that acupuncture treatment can effectively relieve muscle spasm in patients. Compared with the control group, the incidence of muscle spasm in the acupuncture treatment group will be reduced by 35% [12]. There are also clinical research results show that the earlier patients receive acupuncture treatment, the shorter the time to recover motor function after stroke, and the more obvious the treatment effect [13, 14]. The results of this study show that compared with con group, the motor function score of AC group is higher and the recovery effect is better. The results of this study are consistent with the above results, which confirms that acupuncture and moxibustion can help to restore motor function.

After stroke, the ability of daily living of patients will be affected to varying degrees. In severe cases, they will lose the ability of independent living, and even need feeding, which will cause serious family burden to the patients' families [15, 16]. According to the statistical results of the late recovery of stroke patients, about 60% of the patients can recover their independent living ability after receiving rehabilitation training alone, and the sequelae of the remaining 40% patients are very obvious, mainly manifested as unstable walking, upper arm shaking and other conditions, and the late quality of life is poor [17]. Research results on the specific mechanism of acupuncture therapy show that acupuncture therapy mainly stimulates the relevant acupoints of the human body, promotes the vein of the body to maintain a smooth state, promotes blood circulation, and is beneficial to the recovery of patients' limb motor function, so as to achieve effective treatment of the disease, significantly improve the patients' independent living ability, and relieve the pressure of family care [18]. The results of this study show that acupuncture can effectively improve the ability of daily living of patients, about 92% of patients in AC group can restore the ability of independent living, which is significantly higher than that in the control group. The results of this study are consistent with the above results.

Acupuncture and moxibustion can enhance the cerebral artery elasticity of patients, relieve their emotions, expand blood vessels, improve the blood supply to the brain, promote the normal blood and oxygen supply to the brain, and promote the recovery of stroke sequelae [19-21]. There are reports about the neurological function of stroke patients in the literature, which show that acupuncture therapy can promote the recovery of neurological function, shorten the healing time of patients, and improve the healing effect [22]. Research results of some scholars show that acupuncture therapy can significantly improve the blood hypercoagulability of patients, increase the body's high-density lipoprotein, effectively reduce the body's cholesterol accumulation, significantly improve the brain blood supply of patients, and can largely restore the damaged brain tissue function of patients [23-25]. However, there are also studies on acupuncture and moxibustion, which show that acupuncture treatment has no obvious effect on some patients, and may even cause stress reactions such as nervous tension and over stimulation in some patients [26]. The results of this study show that acupuncture treatment can significantly improve the neurological deficit of patients, which is different from some of the above research results. The main consideration is that some patients are allergic to acupuncture treatment, or they are too nervous in the process of treatment, which affects the treatment effect.

In the process of treatment, the acupuncture group mainly through the skin and soft tissue, acting on the target acupoints, to achieve the therapeutic effect. But in the whole treatment process, it is inevitable to stimulate the skin and soft tissue of patients, and produce pain, tension and other situations, which lead to cardiovascular disease, cerebrovascular disease, severe muscle spasm in a few patients. Some scholars follow-up study of 266 stroke patients receiving acupuncture treatment showed that the incidence of adverse reactions was about 2.15%, slightly higher than that of general rehabilitation training patients (2.02%) [27]. In addition, the clinical treatment results showed that compared with ordinary rehabilitation training, the compliance of acupuncture treatment was lower, and the incidence of muscle spasm was higher [28-30]. The results of this study show that the incidence of adverse reactions of cardiovascular disease, cerebrovascular disease and severe muscle spasm in con group and AC group is roughly the same, there is no statistical difference. The main consideration of different research results is that some patients receive injection treatment for the first time, or the treatment frequency is less, and the body tension leads to muscle spasm and other symptoms. In the process of acupuncture and moxibustion treatment, the stimulation of some acupoints, pain is strong, may induce some patients with cardiovascular disease, cerebrovascular disease and other basic diseases.

In this study, there are still some shortcomings, there is no single acupuncture treatment control group, which may lead to research bias. Secondly, the number of cases included in this study is small, and large-scale multi center clinical study is needed for further verification. Finally, we have not followed up the long-term results of the patients, so the results are limited to short-term rather than long-term results.

In short, in this study, we found that after the intervention of acupuncture combined with rehabilitation training, the motor function, activities of daily living, neurological deficit and other indicators of stroke patients recovered well, which provides the research direction and theoretical basis for the next research on the treatment of limb spasm after stroke.

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Declaration of interest

None.

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Table 1. General baseline information

Parameter	AC(n=116)	CON(n=116)	P
Men/women	64/52	56/60	0.775
Age (years)	73.1±1.27	71.54±1.26	0.659
BMI (kg/m ²)	28.2	27.6	0.119
Smoking (n)	67	62	0.289
Drinking (n)	63	67	0.83
blood pressure(mmHg)	131/91	127/84	0.617
Creatinine(μmol/L)	286.13	228.85	0.386
LDL (mmol/l)	2.6±0.12	3.3±0.11	0.218
hypertension	98	65	0.339
diabetes	95	69	0.114

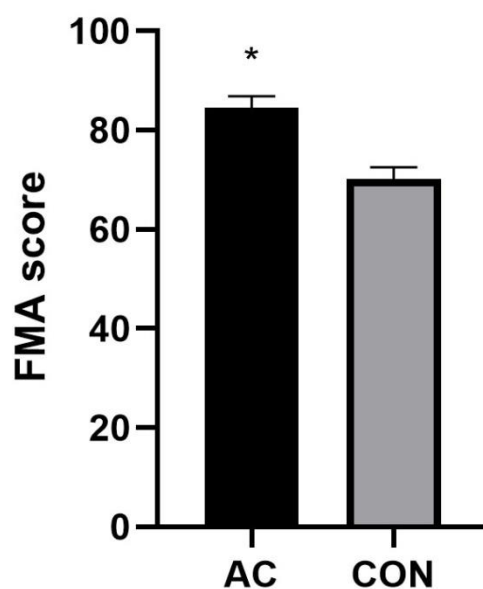


Figure 1. The motor function scores of the two groups were compared

Con: control group; AC: acupuncture combined with rehabilitation training group; FMA: Fugl Meyer evaluation table. *P<0.05.

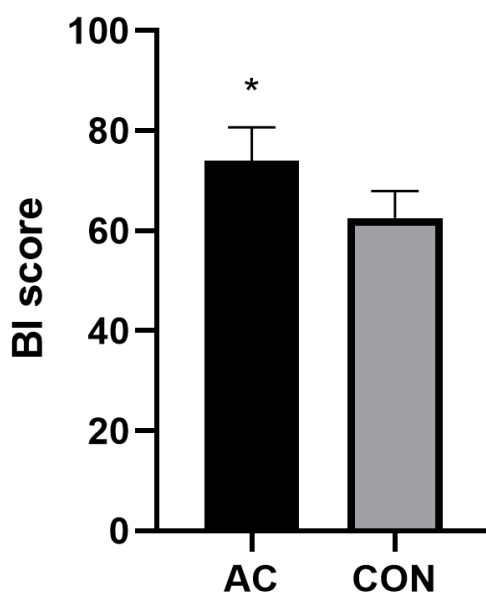


Figure 2. The activities of daily living of the two groups were compared

Con: control group; AC: acupuncture combined with rehabilitation training group; bi: Barthel index scale. * $P < 0.05$.

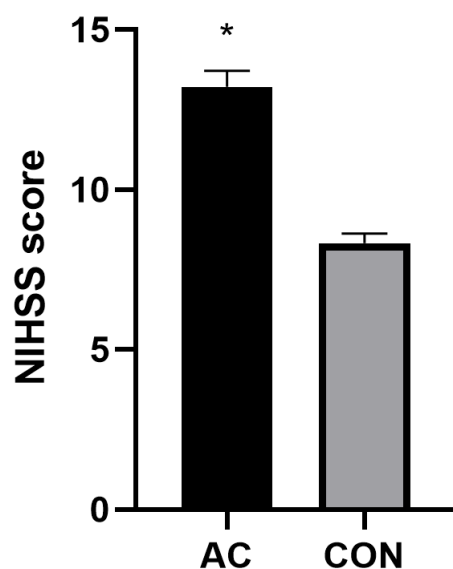


Figure 3. The neurological deficit scores of the two groups were compared

Con: control group; AC: acupuncture combined with rehabilitation training group; NIHSS: NIH Stroke Scale. * $P < 0.05$.

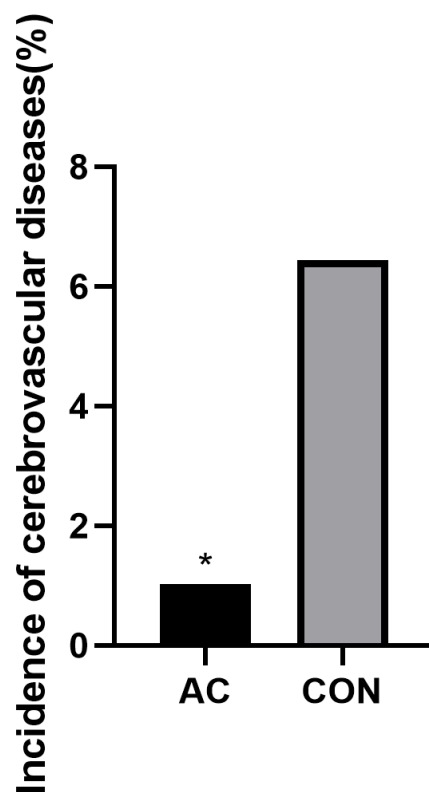


Figure 4. Comparison of cardiovascular disease incidence between the two groups
 Con: control group; AC: acupuncture combined with rehabilitation training group. *P<0.05.

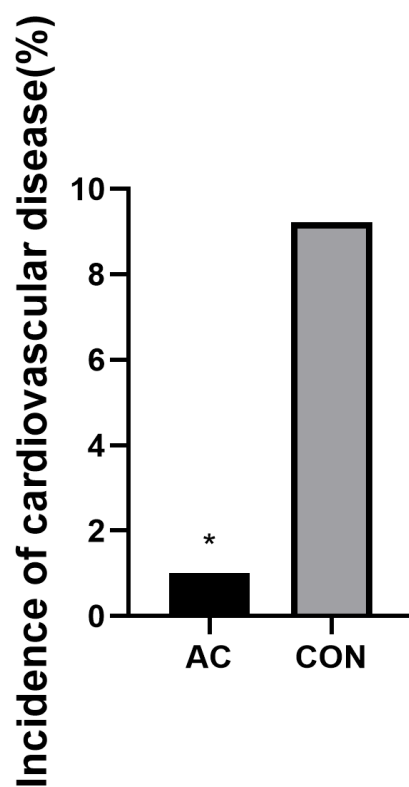


Figure 5. Comparison of the incidence of cerebrovascular disease between the two groups

Con: control group; AC: acupuncture combined with rehabilitation training group. * $P < 0.05$.

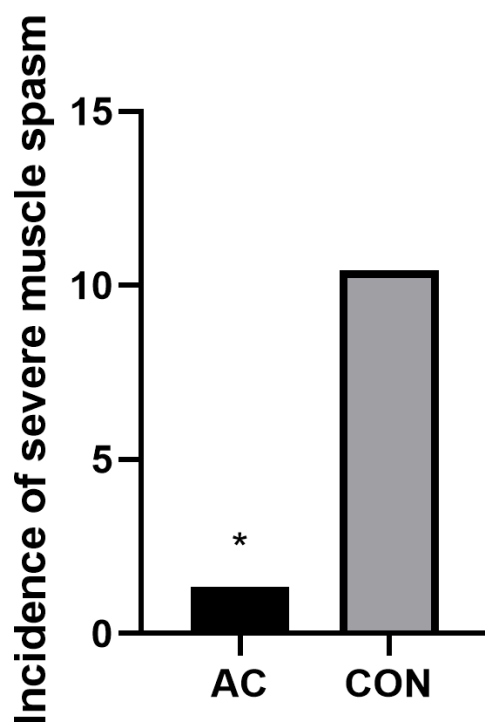


Figure 6. Comparison of the incidence of severe muscle spasm between the two groups
Con: control group; AC: acupuncture combined with rehabilitation training group. * $P < 0.05$.