

Clinical Effect of Buyang Huanwu Decoction Combined with Acupuncture in Treating Cerebral Infarction Sequelae

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Abstract: *Objective:* To explore the clinical effect of Buyang Huanwu Decoction combined with acupuncture in treating cerebral infarction sequelae. *Methods:* In this study, 80 patients with cerebral infarction sequelae admitted to the hospital from April 2022 to March 2024 were selected and divided into a control group ($n = 40$) and a combined group ($n = 40$) according to different treatment regimens. The control group received acupuncture treatment alone, while the combined group received Buyang Huanwu Decoction treatment based on the control group. The clinical effects, physical indicators, and adverse reactions of the two groups were compared and observed 3 months after treatment. *Results:* After treatment, the clinical efficacy of the combined group (92.50%) was significantly higher than that of the control group (72.50%) ($p < 0.05$). The physical indicators of the combined group were significantly better than those of the control group ($p < 0.05$). Additionally, the combined group had fewer adverse events than the control group ($p < 0.05$). *Conclusion:* The combination of Buyang Huanwu Decoction and acupuncture has significant efficacy in treating cerebral infarction sequelae. It can effectively contain disease progression, reduce adverse events, and significantly improve patients' physical indicators. This treatment approach has clinical promotional value.

Keywords: Buyang Huanwu Decoction; Acupuncture; Cerebral infarction sequelae; Clinical efficacy

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1. Introduction

Cerebral infarction is caused by insufficient blood supply to certain brain regions due to various reasons, leading to ischemia, hypoxia, and cell necrosis. Clinically, it manifests as varying degrees of neurological dysfunction. As the disease progresses, patients may develop sequelae such as limb movement difficulties, crossed paralysis, memory loss, visual field defects, and language difficulties^[1]. Traditional Chinese medicine has shown significant efficacy in treating cerebral infarction sequelae. The combined application of traditional Chinese medicine and various techniques of traditional Chinese medicine is helpful for patients' functional recovery, and its intervention value cannot be ignored^[2]. In the clinical practice of traditional Chinese medicine, acupuncture is a commonly used treatment for such sequelae. It has a long history in China. Buyang Huanwu

Decoction has the effect of promoting blood circulation and nourishing blood, removing blood stasis without damaging the blood condition, and dredging meridians^[3]. Therefore, this study explores the clinical effect of Buyang Huanwu Decoction combined with acupuncture in treating cerebral infarction sequelae. The report is as follows.

2. Materials and methods

2.1. General information

In this study, 80 patients with cerebral infarction sequelae admitted to the hospital were selected as the research subjects. They were divided into a control group and a combined group based on the differences in treatment methods, with 40 patients in each group. The combined group consisted of 22 males and 18 females, aged between 52 and 83 years old, with an average age of (72.19 ± 8.55) years old and a disease duration of (2.11 ± 0.38) months. The control group consisted of 21 males and 19 females, aged between 54 and 81 years old, with an average age of (72.74 ± 8.32) years old and a disease duration of (2.18 ± 0.37) months. All patients (or/and) their families were fully informed and voluntarily chose to participate in this research activity. There was no significant difference between the two groups ($P > 0.05$). This study was approved by the ethics committee of the hospital.

2.2. Inclusion and exclusion criteria

Inclusion criteria: (1) Meet the diagnostic criteria of traditional Chinese medicine^[4], mainly manifesting as symptoms such as unclear speech, facial distortion, and hemiplegia, followed by dizziness, persistent coughing, severe headache, and imbalance of body; (2) Meet the diagnostic criteria of western medicine confirmed by MRI or CT; (3) Age over 40 years.

Exclusion criteria: (1) Presence of contraindications to medication; (2) Clear organic damage to major internal organs such as the heart, liver, and kidneys; (3) Presence of brainstem infarction or hemorrhage; (4) Complete loss of consciousness; (5) Presence of malignant tumors.

2.3. Methods

The control group received a single acupuncture treatment: 0.25 mm Hua Tuo brand acupuncture needles (National Medical Device Registration Number: 201662270970) were used. The primary acupoints included Juegu (GB39), Sishencong (EX-HN1), and Baihui (GV20). The acupoints were selected based on the symptoms: for phlegm and blood stasis obstructing collaterals, Zhongwan (CV12), Hegu (LI4), Fenglong (ST40), Danzhong (CV17), Taichong (LR3), and Yanglingquan (GB34) were added; for Qi deficiency and blood stasis, Zusanli (ST36), Taichong (LR3), Qimen (LR14), Hegu (LI4), and Yanglingquan (GB34) were selected; for oral and ocular distortion, Jiache (ST6), Yingxiang (LI20), Taichong (LR3), Dicang (ST4), Hegu (LI4), and Xiaguan (ST7) were chosen; for flaccid paralysis of lower limbs, Fengshi (GB31), Yanglingquan (GB34), Zusanli (ST36), and Huantiao (GB30) were the acupoints. Acupuncture was performed on bilateral main acupoints and corresponding syndrome-specific acupoints daily, focusing on the affected side. The needles were retained for 30 minutes. The treatment was continuous for 30 days.

The combined group received “Buyang Huanwu Decoction” based on the control group’s treatment. The medicinal herbs included 30 g of Huangqi (Astragalus), 15 g each of Honghua (Safflower), Taoren (Peach Kernel), Chuanxiong (Szechuan Lovage Rhizome), Danggui (Chinese Angelica), and Dilong (Earthworm), and 10 g of Chishao (Red Peony Root). The dosage was adjusted according to the severity of the symptoms. For patients with Qi and blood deficiency, Dangshen (Pilose Asiabell Root) was added appropriately; for patients

with constipation, Xingren (Almond) was used in combination, but excessive amounts should be avoided to prevent uncontrolled bowel movements; for patients with incontinence, Jinyingzi (Cherokee Rose Fruit) was added; for patients with edema of the limbs, the dosage of Fuling (Poria) was increased to promote urination and reduce swelling. The above medicinal herbs were mixed and decocted with cold water to 300 mL. 100 mL was taken each time, three times a day. Nine days constituted one course of treatment, and three consecutive courses were administered.

2.4. Observation indicators

Observation and analysis of the efficacy, physical data, and adverse reactions of the two groups were conducted before and 3 months after treatment.

- (1) Clinical effect: The resolution of symptoms, clinical signs, and functional improvement in each group were observed. A significant effect was defined as the disappearance or significant reduction (greater than or equal to 30%) of the lesion, accompanied by a notable improvement in patient function. Effective was defined as a moderate reduction in lesion size between 30–60%, with slight improvement in clinical symptoms and signs but not complete resolution. Ineffective was defined as no significant reduction in the lesion and inability to perform daily activities independently. The overall clinical effect was calculated as $[(\text{significant effect} + \text{effective}) / \text{total number of cases}] \times 100\%$.
- (2) Physical indicators: Physical indicators of the two groups were compared and observed before and 3 months after treatment using the Activity of Daily Living Scale (ADL), with scores positively correlated to daily living abilities (maximum score of 50); the Barthel Index (BI), with scores positively correlated to activity abilities (maximum score of 100); and the National Institute of Health Stroke Scale (NIHSS), with scores negatively correlated to indicators (maximum score of 10).
- (3) Adverse reactions: Adverse reactions during treatment, including fatigue, nausea, and dizziness, were observed and compared between the two groups. The total incidence of adverse reactions was calculated as $[(\text{fatigue} + \text{nausea} + \text{dizziness}) / \text{total number of cases}] \times 100\%$.

2.5. Statistical methods

The data obtained in this study, including normally distributed measurement data (t) and count data (χ^2), were analyzed using SPSS 24.0 statistical software. Measurement data were expressed as mean \pm standard deviation (SD) and count data were expressed as (n , %). If $p < 0.05$, the results were considered statistically significant.

3. Results

3.1. Comparison of clinical effects between the two groups

After treatment, the significant effectiveness rate of the combined therapy intervention was 92.50%, which was significantly better than the 72.50% in the control group ($p < 0.05$). See **Table 1** for details.

Table 1. Comparison of clinical effects between the two groups [$n(\%)$]

Groups	n	Efficient	Effective	Ineffective	Total clinical outcome
Control group	40	21	11	11	72.50
Combined GROUP	40	28	9	3	92.50
χ^2					5.541
p					0.018

3.2. Comparison of physical indicators between the two groups of patients

Before treatment, there is no more significant difference between the physical indicators of the two groups of patients ($p > 0.05$); after the end of treatment, the combined therapy is significantly better than monotherapy ($p < 0.05$). See **Table 2**.

Table 2. Comparison of physical indicators before and after treatment of the two groups of patients (mean \pm SD)

Groups	<i>n</i>	ADL		BI index		NIHSS	
Control group	40	58.29 \pm 1.21	65.38 \pm 1.78*	21.52 \pm 6.43	45.12 \pm 9.21*	6.21 \pm 1.78	4.78 \pm 1.42*
Combined group	40	58.22 \pm 1.18	74.14 \pm 1.98*	21.51 \pm 5.78	55.78 \pm 10.78*	6.19 \pm 1.56	3.12 \pm 1.98*
χ^2		0.262	20.808	0.007	4.755	0.053	4.308
<i>p</i>		0.794	< 0.001	0.994	< 0.001	0.957	< 0.001

Note: Compared with the same group before treatment, * $p < 0.05$.

3.3. Comparison of the occurrence of adverse reactions between the two groups of patients

The combined group had a significant reduction in their adverse events after treatment ($p < 0.05$). See **Table 3**.

Table 3. Comparison of the occurrence of adverse reaction events between the two groups of patients [*n*(%)]

Groups	<i>n</i>	Fatigue	Regurgitation	Dizziness	Total adverse event occurrence
Control group	40	2	2	3	17.50
Combined group	40	1	0	0	2.50
χ^2					5.000
<i>p</i>					0.025

4. Discussion

Cerebral infarction originates from the obstruction of blood supply to the brain, leading to neuron damage due to hypoxia. After the onset of the disease, patients' physical activities and central nervous system will be severely affected, leaving many sequelae and significantly reducing their quality of life [8]. Common sequelae of cerebral infarction include language communication disorders, accompanied by limb movement disorders, nervous system dysfunction, including dysphagia, bowel and bladder control disorders, and visual impairment [9]. At this stage, modern medicine has not determined an effective method to cure the sequelae of cerebral infarction and can only control symptoms through medication, with poor efficacy. Therefore, in recent years, the treatment direction for the sequelae of cerebral infarction has shifted to traditional Chinese medicine therapies. In traditional Chinese medicine, cerebral infarction is explained as caused by imbalances of Yin and Yang, weakness of healthy Qi, and disorders of Qi and blood, leading to damage of brain collaterals and obstruction of brain vessels. Although symptoms can be alleviated with appropriate treatment, the loss of Qi remains significant, and there is still residual blood stasis in the brain, which further damages brain collaterals and complicates the condition. Therefore, traditional Chinese medicine advocates that the treatment of sequelae of cerebral infarction should follow the principles of promoting blood circulation to remove blood stasis and nourish Qi and blood [10].

Buyang Huanwu Decoction, created by famous Qing Dynasty physician Wang Qingren, combines the treatment methods of removing blood stasis and nourishing Qi and blood. It has demonstrated significant

efficacy in the treatment of cerebral infarction and has been affirmed by modern medicine. The main ingredient of this formula is *Astragalus membranaceus*, which has the effect of nourishing Qi. It also contains earthworm, peach kernel, Chuanxiong rhizome, safflower, and red peony root, which have the functions of promoting blood circulation to remove blood stasis, relieving pain and anti-inflammatory effects, relaxing muscles and activating collaterals, as well as *Polygala tenuifolia* and *Acorus tatarinowii*, which can promote blood circulation and Qi flow. The entire formula is designed to nourish Qi and promote blood circulation, dredge meridians and activate collaterals. Modern medical research has further confirmed that this formula has significant effects on vasodilation, thrombolysis, and anticoagulation, and can effectively reduce blood viscosity. Acupuncture, as a unique diagnostic and treatment method of traditional Chinese medicine, not only helps to dredge the brain's meridians and collaterals by stimulating acupoints but also significantly adjusts cerebral blood flow. It can further improve neurotransmitter transmission function, promote the repair and regeneration of damaged neurons, and thus enhance neurological activity^[11]. Furthermore, studies have found that Buyang Huanwu Decoction has the effects of nourishing the liver and kidney, promoting blood circulation and dredging veins, and maintaining homeostasis. Combining Buyang Huanwu Decoction with acupuncture can not only soothe the patient's brain, reduce intracranial pressure, and improve organ function deficiency, but also enhance the patient's immune metabolism, significantly slow down neuronal apoptosis, achieve treatment effects and obtain good results^[12,13].

Before treatment, there were no significant differences in various physical indicators between the two groups of patients ($p > 0.05$). In this study, the clinical efficacy of 92.50% is similar to the research results of Wu *et al.* (2022)^[14], which is 89.19%. After treatment, the combined group of patients showed significant improvement compared to the control group ($p < 0.05$). The reason for this is that acupuncture, as one of the traditional Chinese medicine rehabilitation therapies, has significant efficacy in the treatment of cerebral infarction sequelae. Combined with Buyang Huanwu Decoction, it has the effects of promoting blood circulation to remove blood stasis, benefiting the liver and strengthening the kidneys, which helps to improve the body's immune system and blood circulation efficiency, thereby achieving the goal of improving various physical indicators of patients. After treatment, the incidence of adverse events in the combined group was lower than that in the control group ($p < 0.05$). The reason is that the main acupuncture points selected in this study include Juegu, Sishencong, and Baihui, which help to regulate Qi and blood and relax the meridians and tendons. Appropriate adjustments and combinations are made based on the symptoms, and individualized acupuncture treatment plans are implemented. Through the combination of oral Chinese medicine and acupuncture therapy, it can improve the efficiency of blood flow in the body, gradually improve the microcirculation of the brain, ensure the supply of neuronutrition, and have a good effect on sequelae, improving patients' physical indicators while reducing the occurrence of adverse events^[15].

5. Conclusion

In summary, the combination of Buyang Huanwu Decoction and acupuncture has significant effects on cerebral infarction sequelae, which can control the progression of the disease, delay deterioration, reduce complications, and improve patients' physiological parameters. It has the potential for clinical application and promotion.

Disclosure statement

The authors declare no conflict of interest.

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