

Research Progress of Zhenfang Baimaru Powder on the Treatment of Acute Cerebral Infarction with Wind-phlegm-blocked Collaterals by Acupuncture Points

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Abstract: Cerebral infarction belongs to the category of "stroke" in Chinese medicine. Among the etiology and pathogenesis of acute stage of cerebral infarction, phlegm and blood stasis interjunction is the main pathogenesis change of acute stage of cerebral infarction, and as the main pathological factor throughout the disease process. In recent years, clinical researchers have mostly studied the application of removing blood stasis and eliminating phlegm in the acute stage of acute cerebral infarction from the aspects of improving hemorheology, regulating blood lipids, anti-free radical damage and protecting vascular endothelial function, etc. The changes of relevant indicators have been used as the objective basis for the effectiveness of removing blood stasis and eliminating phlegm in the treatment of acute cerebral infarction, and great progress has been made.

Keywords: Zhenfang Baimaru, Directional penetration, Acupoint, Acute cerebral infarction.

1. Introduction

In recent years, TCM emergency medicine has been widely used and achieved good results in the treatment of cerebrovascular diseases through the use of TCM theories and modern scientific and technological means to study and deal with the etiology and pathogenesis of acute and critical diseases, the evolution law of syndromes, syndrome differentiation and treatment. The technology of directional penetration of traditional Chinese medicine is to activate the drug ions on the skin surface by modulating asymmetric intermediate frequency current at low frequency, so as to penetrate into the treatment site to play a therapeutic role. Many clinicians use the true formula Baimaru powder to treat patients with acute stage of ischemic stroke (syndrome of wind-phlegm blocking collaterals) through point-directed drug penetration, The effect of the prescription on inflammatory cytokines and hemorheology index and the evaluation of its therapeutic effect are reviewed in this paper.

2. Effect on Hemorheology

The hemorheological indexes of cerebral infarction patients were abnormal, especially hyperviscosity and hypercoagulability. The platelet distribution width, mean platelet volume and large platelet ratio of cerebral infarction patients were higher than those of normal people. Hu Yinghua et al. [1] randomly divided 80 patients with ischemic stroke into a treatment group and a control group. The control group was given basic symptomatic treatment, active control of blood pressure, blood sugar and blood lipids, and specific treatment and neuroprotective treatment including intravenous thrombolysis, anti-platelet aggregation, anticoagulation, defibrination and dilatation to improve cerebral blood circulation. On the basis of the control group, Zhenfang Baimaru powder was given point-oriented transdrug therapy. Ingredients: White aconite, Araceae, aconitum, scorpion 12g each, Citri, Aurantii, Gastrodia 10g

each. Vertigo heavy add hook vine, chrysanthemum 6g each; Add peach kernel and red peony 6g each for heavy blood stasis, and add scutellaria and gardenia 6g each for restfulness. The above medical grinder into a fine powder through 200 mesh sieve, with honey into paste reserve. Operation method of acupuncture point directional penetration: Points were selected on the affected side of the limb, Jianjiu, Quchi, Waiguan Hehe Valley were taken from the upper limb, Huantiao Hefengshi, Zusanli and Fenglong were taken from the lower limb, about 5g of Zhenfang Baimaru powder ointment was applied to the center of the electrode patch (diameter about 1.5cm, thickness about 2mm), and then applied to the treatment points. The adjacent acupuncture points formed 4 groups of treatment channels respectively. Connected with the traditional Chinese medicine directional penetration therapy instrument (DSMF2A type of Nanjing Dingshi Medical Equipment Co., LTD.), the treatment temperature was 45°C, continuous wave, slight muscle fibrillation of the treatment site was appropriate, each treatment was 30min, twice a day. After 2 weeks of treatment, whole blood viscosity (high incision, low incision), hematocrit and platelet adhesion rate in both groups were better than before treatment (all $P < 0.01$), and the treatment group was better than the control group (all $P < 0.01$). Li Yishen et al. [2] found that after treatment, the levels of serum IMA, plasma FIB and D-D in the 2 groups were lower than those before treatment ($P < 0.05$), and after treatment, the levels in the treatment group were lower than those in the control group ($P < 0.05$). It showed that the true formula white ball had the functions of reducing fibrinogen, reducing blood viscosity, anti-thrombolysis and thrombolysis.

3. Effects on Blood Lipids

The increase of blood lipid level is closely related to cerebral infarction in middle and old age. Sun Jia et al. [3] randomly divided 62 patients with cerebral infarction into control group (30 cases) and observation group (32 cases). On the basis of

conventional treatment, the two groups were treated with true white balls (self-formulated in the hospital, pinellia, Araceae, Gastrodia gastrodia, Unguarua, Angelica sinensis, Radix Paeoniae, Radix spatholobi, calamus flagellia, radix polygala, etc.) for 30 consecutive days. Observation group was also treated with Xingnaokaiqiao acupuncture. Take two side Fengchi point, Shuigou point, two side Neiguan point, two side Tongli point, Jiquan point, two side Sanyinjiao, Weizhong point, Tou needle. According to the different acupuncture points, different acupuncture methods are adopted, and the replenishment and catharsis are carried out in strict accordance with the skills of awakening brain and opening orifice acupuncture therapy. After continuous treatment for 1 month, it was found that the level of low density lipoprotein cholesterol (LDL-C) in the observation group was not significantly different from that in the control group before treatment ($P > 0.05$), and that in the observation group after treatment was lower than that in the control group ($P < 0.05$), indicating that the true formula white ball has the effect of reducing blood lipid.

4. Effect on Inflammatory Factors

High Hcy is involved in the whole course of acute cerebral infarction, which has important clinical research value. Hcy mainly affects oxidative stress, vascular endothelia, smooth muscle cells, coagulation function, lipids and other aspects of the body, resulting in vascular endothelial cell damage, smooth muscle cell proliferation, blood coagulation and lipid peroxidation enhancement, thus leading to acute cerebral infarction. CRP is a typical acute phase protein synthesized by the liver induced by cytokines IL-1 and IL-6. At the early stage of atherosclerotic damage, CRP and the cell membrane formation complex attach to vascular endothelial cells, resulting in vascular endothelial cell damage, and inflammatory response promotes the occurrence and development of atherosclerosis and promotes the formation of atherosclerosis [4-6]. Zhang Xiufang et al. [7] randomly divided 75 patients with acute cerebral infarction into the treatment group (38 cases) and the control group (37 cases). The treatment group was given Zhenfang Baikuo decoction combined with Edaravone and basic treatment, and the control group was given Edaravone and basic treatment, with a course of 2 weeks. After 2 weeks of treatment, the clinical symptoms and hs-CRP expression levels in the treatment group were significantly lower than those in the control group ($P < 0.05$). The addition and reduction of true formula white ball can significantly reduce the expression of hs-CRP in the serum of patients with acute cerebral infarction, improve the prognosis of patients with acute cerebral infarction, reduce the expression of inflammatory factors in patients with acute cerebral infarction, and reduce the inflammatory response, which may be one of the mechanisms of this formula to improve the prognosis of patients with cerebral infarction. Sun Shiji et al. [8] added true-formula white ball decoction on the basis of conventional Western medicine treatment, and after treatment, the total effective rate of the observation group and the control group reached 94.0% and 78.0%, respectively, with significant differences ($P < 0.05$). In the evaluation of Barthel, NIHSS and CRP, both groups were improved after treatment, and the observation group was better ($P < 0.05$). It is concluded that the addition of decoction of traditional white ball on the basis of conventional western

medicine treatment in the treatment of acute cerebral infarction wind-phlegm into collaterals is effective, which is helpful to promote the prognosis of patients. Zhang Yinghong et al. [9] treating patients with wind-phlegm-in-collaterals type of acute cerebral infarction with true decoction can improve the therapeutic effect and CRP level, which is characterized by high safety and significant curative effect.

5. Free Radical Damage Resistance

Free radical chain reaction is the main cause of nerve damage in acute cerebral infarction, especially delayed neuron damage, so it is necessary to conduct anti-free radical damage treatment in the early stage of acute cerebral infarction [10]. Niu Dawei et al. [11] took 70 patients with wind-phlegm blocked collateral-collateral stroke as research objects and randomly divided them into observation group and control group, with 35 cases in each group. The control group was treated with true white pill, and the observation group was treated with Tongnao-activating collaterals acupuncture on the basis of the control group. The results showed that before treatment, there was no significant difference in the levels of brain-derived neurotrophic factor (BDNF) and nerve growth factor (NGF) in serum between 2 groups ($P > 0.05$). The serum neurotrophic factor levels of BDNF and NGF in observation group were higher than those in control group on day 7 and day 14 of treatment, and the difference was statistically significant ($P = 0.000$). Before treatment, serum oxidative stress factors of superoxide dismutase (SOD) and malondialdehyde (MDA) were detected in both groups. There was no significant difference in level ($P > 0.05$). After 7 and 14 days of treatment, the serum levels of SOD and MDA in observation group were lower than those in control group, and the difference was statistically significant ($P = 0.000$). It is concluded that Tongnao Activating collaterals acupuncture combined with true decoction white pill can significantly improve the level of serum neurotrophic factor and reduce the influence of oxidative stress factor on the body. Hu Yinghua et al. [1] added Zhenfang Baimaru powder on the basis of the treatment of the control group and treated it with point-directed transdrug for 2 weeks, and the total effective rate of the treatment group was 94.87% higher than that of the control group (78.95%, $P < 0.05$). Before treatment, there were no significant differences in the indexes of hypersensitive C-reactive protein (hs-CRP), interleukin-6 (IL-6) and tumor necrosis factor- α (TNF- α) between the two groups ($P > 0.05$). After 2 weeks of treatment, hs-CRP, IL-6, TNF- α and other indexes in both groups were better than before treatment (all $P < 0.01$), and the treatment group was better than the control group (all $P < 0.01$). It is proved that Zhenfang Baimaru powder can effectively improve the abnormal inflammatory cascade reaction of brain damage in patients with acute stage of ischemic stroke (syndrome of wind-phlegm blocking collateral).

6. Security Verification

The more common type of stroke in traditional Chinese medicine is the syndrome of wind-phlegm entering collaterals. This type of vein is empty, wind-phlegm enters the middle with vacuity, and Qi-blood is blocked. In this study, we used the true formula of white ball soup, the formula is: white aconite, araceae, aconitum, scorpion 12g each, Radix citri,

Fructus aurantii, gastrodia gastrodia 10g each. In the process of treatment, we were worried about the safety of the drug, because there were many toxic drugs in the formula, such as Radix aconitae, pinellia, scorpion, Araceae and radix aconitae. However, animal experiments showed [12] that the true formula of Radix aconitae had no obvious abnormal effects on various indexes of rats, including general condition, body weight, organ index, blood routine, blood biochemical index and organ structure. According to the study of Ma Ya et al. [12], the patients' conditions would be improved to varying degrees with the use of authentic white balls, and there would be no deterioration even if there was no improvement. However, with traditional Western medicine, the conditions of some patients did not get any improvement, and even worsened, by comparison, $P < 0.05$; Although the difference of blood routine and liver and kidney function test between the two groups was slightly different, it was not obvious, and the relative ratio was $P > 0.05$, which proved that the true formula white ball had no obvious damage to the human body.

7. Outlook

The technology of directional penetration of traditional Chinese medicine is to activate the drug ions on the skin surface by modulating asymmetric intermediate frequency current at low frequency, so as to penetrate into the treatment site to play a therapeutic role. Compared with iontophoresis and other therapeutic methods, IF pulse current can promote the decrease of skin resistance, dilate capillaries, increase the permeability of blood vessel wall, and thus improve local microcirculation. The directional driving force of electric field on drug ions can make the active components of drugs enter the human body more deeply and effectively to act on the treatment site. Medium frequency pulse current can stimulate the deep muscle to produce contractile movement without tingling, and prevent disuse atrophy and joint contracture of the affected limb. The amount of drug absorption is the key to the development of transdermal drug delivery technology. In this study, acupoints are used as treatment points to give full play to the advantages of transacupoint drug delivery. Acupoints are special point-like parts of the body where qi and blood are injected into and out of the viscera and channels, and are closely related to deep tissues and organs, which can be stimulated to treat diseases [13-15]. Acupoints have sensitivity and amplification effect on drugs, and meridians are low-resistance operating channels in the body, and drugs can quickly produce strong pharmacological effects in targeted organs with small doses through specific meridians. Among the selected treatment points, Jianyu and Weiguan can dredge meridians, regulate qi and eliminate phlegm, Quchi Hehe Valley can clear heat and solve the surface, dredge the channels and collaterals, and ring hop and wind city can dispel wind and remove dampness, relax tendons and activate collaterals. Zusanli and Fenglong can strengthen the stomach and spleen, eliminate phlegm and remove dampness. From the perspective of anatomy, Jianjiu, Quchi, Weiguan Hegu are located in the extensor muscles of the upper limb, while Huan-tiai and Fengshi, Zusanli and Fenglong are located in the flexor muscles of the lower limb. Through medium frequency electrical stimulation, antagonistic muscle groups can be excited to counteract spasticity muscle groups caused by stroke and coordinate the yin-yang balance of muscle tension among muscle groups,

thus promoting the recovery of limb function [16].

As a special treatment of traditional Chinese medicine, acupuncture and moxibustion is based on the theories of Yin and Yang, zang-fu organs, channels and collaterals. Combining with symptom differentiation and point selection, through the stimulation of acupuncture points, it can play the effect of waking up the brain, activating blood circulation and smoothing blood stasis, Fuzhengdispelling evil, dredging channels and clearing collages, and promote the recovery of various functions. The combined application of acupuncture and traditional Chinese medicine decoction can play a synergistic role, treat both inside and outside, and strengthen the therapeutic effect.

In recent ten years, clinical studies on true-formula white ball mainly focus on improving hemorheology, regulating changes in blood lipids, anti-free radical damage and vascular endothelial function protection, etc. Some of these studies are repetitive, and large sample and multi-center clinical studies have not been reported, so there are still many studies to be further strengthened. How the selection of acupoints is integrated with the theory of movement points in rehabilitation medicine, and the influence of the low frequency modulation frequency and depth of the intermediate frequency current of the directional drug transmitter on the therapeutic effect still need to be further observed and studied.

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