

# Research Progress on Post-stroke Sensory Impairment from Traditional Chinese Medicine

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**Abstract:** *With the continuous improvement of medical standards, stroke patients can often receive timely treatment, but the sequelae of stroke deeply troubled the physical and mental health of patients. Sensory impairment is a symptom that often occurs after stroke, in addition to Western medicine treatment, traditional Chinese medicine plays a unique advantage, and has also achieved good clinical results.*

**Keywords:** Stroke, Sensory disturbances, Chinese medicine, Review.

## 1. Introduction

Sensory impairment is a clinical symptom manifested by hyperesthesia, paresthesia, pain, or decreased or absent sensation caused by damage to the sensory nervous system, including superficial sensory, deep sensory and compound sensory disorders. According to statistics, 50%~80% of stroke patients have residual somatosensory impairment, and sensory impairment is a risk factor for post-stroke spasticity, which has obvious adverse effects on motor function and overall recovery from stroke [1-3]. At present, there are limitations in the treatment of Western medicine, which is mainly based on drug treatment and rehabilitation training for nutritional nerves. In recent years, traditional Chinese medicine (TCM) has had considerable effects on post-stroke sensory impairment, and this paper focuses on the research status of TCM in the treatment of post-stroke sensory impairment through the search of relevant literature in recent years, focusing on the treatment of TCM, hoping to provide reference value for future research and individualized treatment of post-stroke limb sensory impairment.

## 2. TCM's Understanding of Post-stroke Sensory Impairment and Its Etiology and Pathogenesis

Post-stroke sensory disorders correspond to the Chinese medicine numbness in clinical practice, according to the performance of numbness, can be classified as numbness and other categories, numbness is a disease name, is a kind of sensory abnormalities occurring in the skin.

According to medical books, ancient doctors believe that numbness disease is located in the skin, its etiology and pathogenesis can be summarized as 2 points: Qi and blood in honor numbness and qi and blood uncommon numbness. "SuWen Yun: Ying Qi and Wei Qi are deficient, they are both insensitive and can not move, so the flesh is more numb and heavy, indicating that qi and blood with disease, skin loss of numbness, "Introduction to Medicine" proposes that "insufficient qi and blood" leads to "stubborn numbness and numbness of the skin", thus inferring that the pathogenic factors of the six external sensations cause numbness and numbness when the skin's qi and blood flow is lost. However,

prolonged accumulation of food, emotions, and toxins can also cause phlegm dampness and blood stasis in the meridians, leading to blood loss and numbness.

## 3. Treatment of Limb Numbness after Stroke

### 3.1 Internal Treatment Method of Traditional Chinese Medicine Decoction

#### 3.1.1 Strengthening Body Resistance to Eliminate Pathogenic Factors

During the struggle between good and evil, it is a movement of mutual growth and decline. In treatment, it is necessary to treat both the root cause and the root cause. At the same time, it is important to eliminate evil while maintaining the right balance, so as to achieve a state of yin balance and yang secrecy. Chen Cunlong [4] randomly divided the patients with thalamic stroke into two groups, 59 cases in each group. The patients with thalamic stroke sensory disorder were treated with Yiqi Tongluo Prescription (15g sun dried ginseng, 3g leech, scorpion, red peony, cicada slough, ground beetle worm, centipede, sandalwood, incense, frankincense, sour jujube kernel). The control group used conventional treatment, including lifestyle intervention, medication, physical therapy and other symptomatic treatment. The observation group added Yiqi Tongluo Prescription on this basis. After four weeks of continuous treatment, it was found that the total effective rate of the observation group was 93.22% (55/59), which was higher than that of the control group was 79.66% (47/59), and there was no adverse reaction in both groups during the treatment. The Yiqi Tongluo formula has a definite therapeutic effect on sensory disorders in thalamic stroke, which can improve the patient's sensation, balance, and neurological function, reduce blood lipid and inflammatory factor levels.

#### 3.1.2 dispelling wind pathogens

Wind is the root cause of all diseases, and its pathogenic factors are present on the surface of the skin. Due to the imbalance of nutrition and hygiene, the skin becomes numb due to lack of nourishment. In terms of treatment, dispelling wind pathogens is the primary task.

Liu Ruifan [6] believes that wind evil plays a key role in post stroke limb numbness. Therefore, a clinical observation was conducted on 90 patients in the control group of 45 cases and the observation group of 45 cases, who were treated with Guizhi Tang Jia Jian Fang. Both groups were treated with conventional Western medicine, while the observation group was treated with Guizhi Tang Jia Jian Fang. A 14 day course of treatment was conducted for a total of 2 courses, and the results showed that the total effective rate of the observation group was higher than that of the control group ( $P < 0.05$ ). On the basis of conventional Western medicine treatment, combined with Guizhi Tang modified formula to treat post-stroke numbness, the therapeutic effect can be improved and symptoms can be alleviated. Tan Haijun [7] selected 59 patients to use the self-designed Sansheng Qufeng Tang combined with treatment for numbness after cerebral infarction. After 2 weeks of treatment, it was found that the hemorheological indicators in the experimental group were lower than before treatment and the control group, and the sensory impairment score in the experimental group was higher than before treatment and the control group; The total effective rate of the experimental group was 94.92%, higher than the control group's 83.05%. It has been confirmed that the use of San Sheng Qu Feng Tang to treat limb numbness after cerebral infarction is worthy of clinical promotion and application.

### 3.1.3 Eliminating phlegm and calming wind

As mentioned earlier, phlegm is a pathogenic factor for numbness. Based on the patient's symptoms and signs, and through dialectical analysis, for patients with phlegm carried by wind, the treatment method of gradually resolving phlegm and calming wind should be followed.

Huang Wei [8] used Banxia Baizhu Tianma Tang to treat patients with acute cerebral infarction caused by wind phlegm stasis obstruction. The control group was treated with butylphthalide, while the observation group was treated with Banxia Baizhu Tianma Tang with a modified formula. The results showed that after 2 weeks of treatment, the scores of limb numbness, dizziness, and coating whiteness in both groups decreased compared to before treatment, and the observation group was lower than the control group; The total effective rate of the observation group was 84.00%, significantly higher than the control group's 64.00%. This proves that the combination of oral Banxia Baizhu Tianma Tang and Jianfang Tang combined with butylphthalide has a significant effect on the treatment of acute cerebral infarction of wind phlegm stasis type. It can better improve clinical symptoms of traditional Chinese medicine, reduce neurological deficits, improve limb motor function and daily living ability. Its mechanism of action may be related to promoting VEGF expression, downregulating NSE expression, and reducing Hcy levels.

### 3.1.4 resolving blood stasis

Traditional Chinese medicine believes that numbness in the body after a cerebral infarction is mainly caused by poor circulation of qi and blood, as well as blockage of meridians. Therefore, the treatment method is to remove blood stasis and unblock the meridians. Wang Junyi [9] divided 74 elderly

patients with cerebral infarction into an observation group and a control group, with 37 cases in each group. Both groups were treated with conventional Western medicine, such as brain protection and vasodilation. On the basis of conventional Western medicine treatment, the control group was given hyperbaric oxygen treatment, while the observation group was given a self-designed Huayu Tongluo Huoxue Tang on the basis of the control group. The treatment time for both groups was 30 days. The results showed that the NIHSS score, Barthel score improvement degree, and total effective rate of the observation group were significantly higher than those of the control group. The various hemorheological indicators and traditional Chinese medicine syndrome scores of the treatment observation group were significantly lower than those of the control group. This confirms that the combination of self-designed Huayu Tongluo Huoxue Tang and hyperbaric oxygen therapy has a good clinical effect in treating elderly patients with hemiplegia during the recovery period of cerebral infarction.

## 3.2 Internal Treatment of Chinese Patent Drug

Niu Wenge [10] will use Tongmai Shuluo liquid to treat patients with limb numbness after stroke. Both groups will receive symptomatic Western medicine treatment and rehabilitation training, while the treatment group will receive Tongmai Shuluo liquid as an adjunct treatment. The results showed that the total effective rate of the treatment group was higher than that of the control group. The Barthel index and Fugl Meyer score in the treatment group were higher than those in the control group. The NIHSS score and total score of traditional Chinese medicine syndromes in the treatment group were lower than those in the control group ( $P < 0.05$ ). It is suggested that Tongmai Shuluo liquid has a good effect in treating limb numbness, qi deficiency, and blood stasis after stroke. Ling Shanshan et al. [11] conducted a double-blind, randomized placebo-controlled clinical trial and observed 60 patients with post-stroke motor and sensory disorders treated with Ruyi Zhenbao Pill. The results showed that Ruyi Zhenbao Pill can improve limb motor, balance, and sensory functions in stroke patients during the recovery period, and has good safety.

## 3.3 External Therapies in Chinese Medicine

### 3.3.1 Special acupuncture method

#### 1) Hand and foot twelve-stitch method

The "Twelve Needles for Hands and Feet" method selects acupoints for the hands and feet, mainly the Yang meridian points, which are matched with Yin and Yang to achieve the effects of harmonizing Yin and Yang, activating meridians, regulating Qi and blood, and thus treating numbness in limbs after stroke. Liang Yirong [12] treated 30 patients with limb numbness after stroke with the twelve needle therapy of hands and feet. The results showed that in the treatment group, 6 cases of numbness had basically disappeared, 20 cases had significantly improved, 3 cases had some relief, and 1 case had no effect, with an effective rate of 96.7%. This indicates that the twelve needle therapy of hands and feet can significantly improve limb sensory disorders after stroke and enhance daily life activities.

## 2) the treatment of "shape and spirit coordination" acupuncture

Peng Jing [13] selected 24 patients with limb numbness at 6 months old for the treatment of "shape and spirit coordination" acupuncture, and evaluated the changes in limb numbness using the Digital Analog Rating System (VAS) before and after treatment; The Nottingham Sensory Assessment Scale (NSA) was used to assess sensory impairment in the affected limb. After 4 weeks of treatment, the results showed a significant decrease in the patient's VAS score compared to before treatment; The NSA score significantly increased compared to before treatment, and the results showed that the "shape and spirit coordination" acupuncture method can effectively improve the clinical symptoms of patients with limb numbness after stroke. The mechanism mainly involves the enhancement of neuronal activity ReHo in the thalamus, insula, cerebellum, vermis, and central posterior gyrus, thereby improving the patient's sensory and motor function and cognitive control ability.

## 3) Tongdu Tiaoshen Acupuncture Method

Wu Liqun [14] selected 40 patients with hemisensory disorders caused by stroke and treated them with Tongdu Tiaoshen acupuncture for 2 weeks. The results showed that compared with the control group, Tongdu Tiaoshen acupuncture can significantly improve the sensory recovery of ischemic stroke patients.

## 4) the skin sliding needling method

Chen Ge [15] used the skin sliding needling method to treat patients with hemiplegia after stroke. Seventy eligible patients were randomly divided into a skin sliding needling group and a conventional needling group, with 35 cases in each group. For the basic diseases of two groups of patients, corresponding traditional Chinese and Western medicine routine symptomatic treatments were given, such as lipid-lowering, blood pressure control, and hypoglycemic. Both groups of patients were treated with "awakening the brain and opening the orifices" acupuncture method. The experimental group was treated with skin sliding acupuncture method, while the control group was treated with conventional acupuncture method, once a day, six times a week, for two weeks. The results indicate that the clinical total effective rate of skin sliding needling method is superior to conventional needling method. The skin sliding needling method is superior to the conventional needling method in improving the sensory impairment score, SDS score, and SAS score of post-stroke patients. The skin sliding needling method has a faster onset rate in treating sensory disorders in the hemiplegic limbs after stroke compared to conventional needling methods. The skin sliding needling method has a low incidence of adverse reactions and is safe and effective in treating hemiplegic sensory disorders after stroke.

## 5) the cluster needling method

Zhou Linying [16] selected 31 patients to use the cluster needling method on the Posterior temporal oblique line as the main treatment for hemiplegic numbness after cerebral infarction. After treatment, it was found that the effective rate

of the treatment group was 93.54%, which was higher than that of the control group 77.42%. In addition, the Fugl Meyer and daily life scores were improved, proving that the combination of the cluster needling method on the Posterior temporal oblique line and conventional acupuncture has a therapeutic effect on hemiplegic numbness after cerebral infarction, can alleviate the symptoms of numbness, and is superior to conventional acupuncture, promoting the recovery of sensory function and the improvement of daily life ability.

## 6) Fire Needle Method

Zheng Xiaotong et al. treated hemiplegia after stroke by needling the acupoint with a filiform fire needle. In the treatment group, on the basis of regular acupuncture, the filiform fire needle was used to numb the finger acupoint in the upper limbs and the foot acupoint in the lower limbs. The control group only used regular acupuncture, and the results showed that the filiform fire needle group could significantly improve the patient's sensory impairment, with a more significant therapeutic effect than the regular acupuncture group, with a total effective rate of 90.91%. Niu Mengxi [18] used fire needle scattered needling of the Yangming meridian on the basis of conventional acupuncture to treat patients with post-stroke sensory disorders. After 4 weeks of treatment, the results showed that the effective rate was 93.33%, which was higher than the control group's 82.76%. This proves that the combination of fire needle scattered needling of the Yangming meridian and conventional acupuncture has significant therapeutic effects on post-stroke sensory disorders, and is superior to conventional acupuncture.

## 7) Warm acupuncture and moxibustion

Lanxie randomly divided [19] 80 patients with stroke sequelae into an observation group and a control group. 39 patients in the control group were treated with conventional western medicine, and 41 patients in the observation group were treated with warm acupuncture and moxibustion. The results showed that after treatment, the total effective rate and TCM syndrome scores in the observation group were significantly higher than those in the control group; The NIHSS score, serum Hcy, NO, TNF- $\alpha$ , S100- $\beta$ , CRP, and IL-6 levels in the observation group were significantly lower than those in the control group; The FMA score and Barthel index were significantly increased compared to the control group. Conclusion: Warm acupuncture and moxibustion has a good effect on the sequelae of stroke. It can improve the neurological function of patients by inhibiting inflammatory reaction and help patients recover from their illness.

## 8) Needle knife therapy

Li Menghan [20] treated patients with sensory disorders during the recovery period of cerebral infarction with a combination of needle knife and acupuncture for awakening the brain and opening the orifices. Acupuncture knife treatment was performed on the occipital protuberance, posterior tuberosity of the atlas, joint ligaments of the cervical facet, and posterior tuberosity of the cervical transverse process, once a week. After 4 weeks of treatment, the analysis results showed a total effective rate of 89.5%, which was higher than the control group's 76.9%. Compared to the

simple acupuncture method for awakening the brain and opening the mind, the combination of needle knife and acupuncture method for awakening the brain and opening the mind has a better therapeutic effect.

### 9) Blood letting therapy

Yang Qiqi [21] included 16 articles and conducted a meta-analysis on the treatment of limb numbness after stroke using bloodletting therapy. The conclusion was that the therapeutic effect is clear and has certain advantages in improving patient numbness symptoms, sensory function scores, and Barthel index improvement. Hua Xiaoqiong [22] treated upper limb sensory disorders in stroke patients with wind phlegm stasis syndrome through bloodletting therapy along the meridian. The treatment results showed that among the 51 cases in the treatment group, 4 cases were cured, 13 cases were significantly improved, 27 cases were effective, and 7 cases were ineffective, with a total effective rate of 86.27%.

#### 3.3.2 Acupoint injection

Wu Ping [23] found through observation of clinical efficacy, FLA scale, and Fugl Meyer scale that its clinical effective rate was as high as 94.12%. The results showed that acupoint injection combined with meridian puncture can alleviate hemiplegic numbness and sensory disorders after stroke, thereby improving limb motor function and enhancing daily activity ability. It has advantages such as simple operation, low cost, and definite therapeutic effect. Pang Xueni [24] used acupoint injection combined with well point bloodletting to treat patients with limb sensory disorders after stroke. The conclusion proved that acupoint injection combined with well point bloodletting can improve the clinical symptoms of patients with limb numbness after stroke, and is superior to the effect of conventional acupuncture treatment. This method is worth promoting and applying in clinical practice. Bai Jiao [25] applied acupoint injection of methylcobalamin to treat patients with limb numbness caused by phlegm stasis obstruction after stroke, and combined with traditional Chinese medicine acupoint application therapy, proved that its treatment plan has a definite therapeutic effect, can promote patient recovery, and provide a more effective clinical treatment plan for treating limb numbness after stroke

#### 3.3.3 Acupoint thread embedding

Liu Xiaotong [26] used buried thread therapy combined with bloodletting puncture to treat 36 groups of patients with hemisensory disorders after stroke. The treatment results showed that on the basis of bloodletting puncture therapy, buried thread therapy had a significant therapeutic effect on patients with post-stroke sensory disorders. Compared with conventional acupuncture, it showed better therapeutic effects, and the treatment interval was long, which can alleviate the tension of patients towards acupuncture. It is worth promoting.

### 3.4 Other Therapies

#### 3.4.1 Package therapy

Ren Jing [27] used Huoxue Tongmai Tang to package and treat 49 patients with cerebral infarction in the recovery period. The results showed that after 4 weeks of treatment, the total effective rate of the observation group reached 91.84%, which was higher than that of the control group 73.47%. After 4 weeks of treatment, the observation group had lower scores for limb stiffness, hemiplegia, lower back and knee soreness, and lower limb numbness compared to the control group, proving that it can alleviate the clinical symptoms of numbness in patients with cerebral infarction during the recovery period and improve motor function.

#### 3.4.2 Scraping therapy

Wan Qing [28] applied holographic meridian scraping therapy to treat 38 stroke patients with limb numbness. The results showed that the total effective rate of improving limb numbness symptoms in the observation group was higher than that in the control group, and there was a statistically significant difference in data comparison,  $P < 0.05$ . This proves that holographic meridian scraping therapy has a definite therapeutic effect on improving upper limb numbness symptoms in stroke patients with wind phlegm obstruction type.

### 3.5 Combination Therapy

#### 3.5.1 Combination of Acupuncture and Medicine

Yang Yi [29] used Huangqi Guizhi Wuwu Tang combined with penetrating needling to treat 45 patients with post-stroke sequelae. The traditional Chinese medicine symptom scores, limb motor function FMA upper and lower limb scores, and neurological function NIHSS scores were observed. The conclusion showed that the combination of Huangqi Guizhi Wuwu Tang and hand foot Yangming meridian penetrating needling treatment had good effects on post-stroke sequelae, with significant improvement in mouth eye deviation and hemiplegia. Shi Hui [30] used the combination of well point bloodletting therapy and Dengyin Naotong capsule to treat patients with post-stroke numbness. The conclusion showed that the combination of Dengyin Naotong capsule and well point bloodletting therapy can significantly alleviate the numbness symptoms of patients with limb numbness caused by thalamic infarction and improve their clinical efficacy. The mechanism may be related to its ability to reduce serum Hcy and IGF II levels, alleviate inflammatory reactions, and improve neurological function.

#### 3.5.2 acupuncture and moxibustion combined with rehabilitation therapy

Yu Gongpei [31] observed the therapeutic effect of combining the awakening and opening acupuncture method with rehabilitation training on post-stroke sequelae. 240 cases were randomly divided into two groups, with 120 cases in each group, using a random number table method. Both groups received rehabilitation training, while the observation group received additional acupuncture techniques for awakening the brain and opening the mind. The results showed that the NIHSS score in the observation group was lower than that in the control group ( $P < 0.05$ ), the Fugl Meyer Motor Function Assessment (FMA) score in the observation group was higher

than that in the control group ( $P<0.05$ ), and the scores of hemiplegia, numbness, and hand and foot swelling in the observation group were lower than those in the control group ( $P<0.05$ ). It has been proven that the combination of awakening the brain and opening the mind acupuncture method with rehabilitation training is more effective in treating post-stroke sequelae. Liu Chunxian [32] used acupuncture and moxibustion therapy combined with rehabilitation therapy to treat patients with upper limb numbness after cerebral infarction. By observing the score of upper limb numbness symptoms, basic activity of life (BADL), assisted activity of life (IADL) and the score of comprehensive quality of life assessment questionnaire (GQOLI-74) in the two groups, he found that acupuncture and moxibustion therapy and rehabilitation training were jointly used in the treatment of patients with upper limb numbness after cerebral infarction. The treatment effect was ideal, numbness was improved, and it was worth promoting.

### 3.5.3 acupuncture and moxibustion combined massage and cupping

Chen Furong [33] treated post-stroke numbness and pain through the combination of balanced muscle relaxation technique and painless fine needle knife therapy. Observing the VAS score and Fugl Meyer sensory score, the results showed that it has a good effect on numbness and pain after stroke, and is safe. Zhou Xueyi [34] treated post-stroke patients with sensory and motor disorders through acupuncture combined with puncture and cupping. The acupuncture group received routine acupuncture treatment, while the combined group received puncture and cupping treatment on this basis. Observe the improvement of sensory function, motor function, numbness symptoms, daily living ability, and neurological function in two groups. The treatment results have shown that acupuncture combined with acupuncture and cupping can promote the recovery of sensory and motor functions in patients with hemisensory disorders after stroke, alleviate numbness symptoms, and promote the improvement of daily living ability and neurological function.

## 4. Summary and Outlook

Post stroke numbness has the characteristics of long duration and high difficulty in treatment. Accompanied by symptoms such as insomnia and anxiety, numbness and post stroke pain mutually affect each other. In recent years, traditional Chinese medicine and acupuncture and moxibustion are mostly used in clinical practice. There are many clinical studies of traditional Chinese medicine in treating post-stroke sensory disorders, and they show good efficacy and low adverse reaction rate. However, there are also related shortcomings: first, the evaluation of sensory disorders in related studies is mostly in the form of scales, lacking objective standards, and there are some deviations. Second, most studies focus on clinical efficacy observation, and lack of modern research on the mechanism of traditional Chinese medicine in treating post-stroke sensory disorders. Thirdly, most studies only focus on short-term efficacy and lack long-term follow-up for patients, which affects the evaluation of long-term efficacy.

In summary, traditional Chinese medicine treatment has the ethnic characteristics of simplicity, safety, and strong

targeting, and is worth promoting and applying in clinical practice; There is a lack of targeted treatment consensus in the field of traditional Chinese medicine. With the increasing number of stroke sensory disorders, treatment plans still need to be continuously improved to achieve more standardized, systematic, standardized, and specific integrated diagnosis and treatment plans of traditional Chinese and Western medicine to guide clinical practice; In future research, multicenter, large sample, double-blind trials should be conducted to further explore and provide theoretical basis for the treatment of post-stroke numbness with traditional Chinese medicine.

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