

Advances in Chinese Medicine for Post-Stroke Cognitive Impairment

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Abstract: With the development of society, the incidence of stroke is increasing and gradually becoming younger. Most patients who have a stroke have some sequelae after clinical improvement, among which the probability of post-stroke cognitive impairment is about 75%, and most of them will appear within six months after the patient has a stroke. The main risk factors for post-stroke cognitive impairment include age, history of smoking, alcohol abuse, elevated blood pressure, blood glucose and lipids, and history of cardiovascular disease. The appearance of post-stroke cognitive impairment seriously affects the basic life of the patient and can place a great burden on the patient's family and affect their quality of life. Currently, modern medicine is mainly based on western medicine and cognitive function training for post-stroke depression, but the efficacy is average. In this paper, we summarize and outline the treatment of post-stroke cognitive impairment with Chinese medicine in recent years to provide some theoretical basis for the clinical treatment of post-stroke cognitive impairment.

1. Introduction

With the development of society, the quality of human life has improved greatly, which has led to many bad habits, resulting in a rising and younger incidence of stroke, which has now become the first disease causing death and disability in China [1]. Most of the patients with stroke have different degrees of cognitive impairment after recovery, and statistically, the frequency of cognitive impairment is well over 50% [2]. In Chinese medicine, cognitive impairment is considered to be "forgetfulness" and "dementia", as stated in *Jing Yue Quan Shu*: "Dementia is a condition in which there is no phlegm, but the patient becomes depressed, or is incompetent, or thinks, or is suspicious, or is frightened, and gradually becomes dementia". The main manifestations of dementia are dullness of mind, dullness of thought, and reduced memory and attention, and the harm caused by cognitive impairment is far more than physical dysfunction [3]. In particular, the treatment effect of cognitive impairment in patients with late stroke is not ideal, and cognitive function is extremely reduced, which seriously affects the quality of life and well-being of patients and their families, and even affects the productivity of society, causing a serious burden to society. Therefore, early and timely prevention of post-stroke cognitive impairment is very important for stroke patients [4]. Prevention of post-stroke cognitive impairment is divided into primary and

secondary prevention, with primary prevention focusing on risk factors for cerebrovascular diseases and secondary prevention focusing on interventions for cardiovascular and cerebrovascular diseases, including atherosclerosis, atrial fibrillation, and heart disease. Currently, the treatment of cognitive impairment after stroke is mainly based on western medicine such as aspirin enteric tablets and cognitive function training, and there is no standard effective treatment plan. In this paper, we summarize the treatment of post-stroke cognitive impairment from traditional Chinese medicine, acupuncture and moxibustion.

2. Chinese medicine for cognitive impairment in stroke

Currently, TCM believes that post-stroke cognitive impairment is located in the brain and is related to dysfunction of the heart, liver, spleen, and kidney, and that the pathogenesis of the disease is the loss of marrow and brain, and the loss of mental function. The pathogenesis is mainly qi deficiency, fire-heat, phlegm and blood stasis, and they are mutually influenced by each other, which is a mixture of deficiency and reality, and the original deficiency and the symptoms are real [5]. According to the etiology of post-stroke cognitive impairment, it can be divided into seven types, including deficiency of medulla oblongata, deficiency of spleen and kidney, deficiency of qi and blood, phlegm clouding the orifices, stasis blocking the brain, fire in the heart and liver, and internal heat toxicity. The treatment should be based on nourishing the liver and kidney, generating essence and nourishing the marrow; warming the liver and kidney, nourishing the yuan and calming the mind; benefiting the qi and nourishing the blood, calming the mind and strengthening the spleen; resolving phlegm and awakening the mind, opening the orifice and educating the mind; activating blood stasis, opening the orifice and awakening the mind; clearing the mind and calming the liver; clearing heat and detoxifying the body, opening the channels and expelling evil. At present, the main herbal medicines for the treatment of post-stroke cognitive impairment are calamus, sour date palm, poria, dilaemon, salvia and Chuanxiong. *Acorus calamus*, warm in nature, belongs to the heart and stomach meridians. It is used to open the orifice, awaken the mind, resolve dampness and harmonize the stomach. Clinical often in the half summer, tiannanxing, etc. with the treatment of stroke phlegm confusion, confusion and other evidence; with hedgehog, bamboo and other evidence of epileptic convulsions with phlegm heat; with Huang Lian, Hou Pu treatment of damp heat in the blockage and other symptoms; with ginseng, Poria treatment of amnesia. Modern pharmacological research shows that calamus volatile oil mainly contains phenylpropanoids, terpenoids. It can improve cognitive impairment, anti-anxiety, anti-depression, anti-epileptic, anti-Parkinsonian, and protect cardiovascular and cerebrovascular [6]. Sour date kernel is flat in nature and belongs to the liver, gallbladder, and heart meridians. It can nourish the heart and nourish the liver, tranquilize the heart and calm the mind, and astringent sweat and generate fluid. It is used clinically with Zhi Mu and Fu Ling for treating false sleeplessness; with Mai Dong and Sheng Di to supplement the deficiency of Yin and Yang of the heart and mind; with *Angelica sinensis* and Huang Qi to strengthen the Qi and blood of the heart and spleen; and with Wu Wei Zi and *Cornus officinalis* to strengthen the righteousness of the whole body. The extract of *Ziziphi jujube* kernel has significant sedative effect, its total flavonoids and total saponin can reduce the spontaneous activity of mice; *Ziziphi jujube* kernel can anticonvulsant, reduce the incidence of convulsions in mice, prolong the time of convulsions and their death; *Ziziphi jujube* kernel can effectively alleviate sleep disorders and other problems, shorten the sleep latency and prolong sleep time; *Ziziphi jujube* kernel saponin is more often used in antidepressant, anxiolytic, etc.; *Ziziphi jujube* kernel oil can improve learning and memory. Date palm oil can improve learning and memory ability; aqueous extract of date palm has preventive effect on cardiac arrhythmia in rats; total flavonoids of date palm extract can resist myocardial ischemia, lower blood lipids, reduce damage to cardiac muscle cells, and also reduce

blood lipid concentration. In addition, sour date kernel for the prevention of cellular oxidation, aging also has a very good effect; can also analgesic, anti-inflammatory, anti-mutagenic and enhance human immunity. Poria cocos, which is flat in nature, belongs to the heart, lung, spleen and kidney meridians. It is used to benefit water and strengthen the spleen, calm the heart and tranquilize the mind. It is often used clinically with *Atractylodes macrocephala* and ginseng to strengthen the spleen and stomach. Studies have shown that the main pharmacological components of Poria are mycorrhizae, triterpenoids, and various fatty acids, which have good diuretic, hepatoprotective, antipathogenic, immune function enhancing, antitumor, and hypoglycemic pharmacological effects [7]. Di Long, cold in nature, belongs to the liver, spleen and bladder meridians. It is used for clearing heat, fixing spasm and clearing the ligaments, and calming asthma and diuresis. It is commonly used clinically to treat high fever confusion, seizures, convulsions, numbness of the limbs, coughing and wheezing with lung fever, and unfavorable urination. Dilute mainly contains a variety of enzymes (such as fibrinolytic enzymes, etc.), a variety of trace elements, a variety of fatty acids, amino acids and earthworms, purines, etc.. It can exert pharmacological effects such as sedative and anticonvulsant, hypotensive, antithrombotic, antipyretic and analgesic, asthma, antitumor, and immune enhancement [8]. *Salvia miltiorrhiza* is slightly cold and belongs to the heart and liver meridian, and is used to invigorate blood circulation, remove blood stasis, relieve pain, clear the heart and eliminate irritation, cool the blood and eliminate carbuncles. It is often used in combination with Mu Xiang and Chuan Pepper to treat chest paralysis and heart pain; with Hong Hua, Xiang Shen and Yi Mu Cao to treat menstruation and fetal birth; with Du Zhong, Dou Wu and *Angelicae* to treat bruises and injuries; and with Sheng Di Huang and Sour Jujube to treat palpitations and other symptoms. Studies have shown that the main pharmacological components of *Salvia miltiorrhiza* are tanshinone and tanshinin, which have antiplatelet aggregation and anti-thrombosis, improving microcirculation, vasodilation, sedation and antibacterial effects [9]. Chuanxiong, which belongs to the liver, gallbladder and heart meridian, is used to invigorate blood circulation, dispel wind and relieve pain. It is often used in combination with *Angelica sinensis* and *Radix et Rhizoma Dioscorea* to treat liver stagnation, blood stasis, and dysmenorrhea. Modern pharmacological studies have shown that Chuanxiong rhizome contains pharmacological components such as volatile oil, alkaloids (chuanxiong zin), lactones (yangchuanxiong lactone), and ferulic acid, which can effectively improve hemodynamics, anti-platelet aggregation and anti-thrombosis, improve microcirculation, sedation, and promote bone marrow hematopoiesis [10]. When treating diseases with Chinese medicine, it is often not confined to single medicine treatment, but often comes in pairs or prescriptions with additions and subtractions. In recent years, most of the formulas for the treatment of cognitive impairment after stroke are based on tonifying the kidney and educating the mind (e.g. tonifying kidney puzzle granules) [11], awakening the brain and opening the orifices (Kaixiao wisdom Tang) [12], tonifying qi, resolving blood stasis and clearing the ligaments (tonifying yang and returning to the fifth soup with addition and subtraction) [13], expelling phlegm and opening the orifices (adding flavor to warm gall bladder soup) [14], and resting the wind and clearing the ligaments to facilitate the flow of water (Ergen long leech soup) [15]. Chinese medicine has achieved remarkable efficacy in the treatment of post-stroke cognitive impairment, providing another new direction for the clinical treatment of post-stroke cognitive impairment.

3. Acupuncture for post-stroke cognitive impairment

With the development of society, there is a profound understanding of physical health and a better acceptance of acupuncture. Some studies have reported that acupuncture has significant efficacy in improving cognitive impairment after stroke. It is said in the A.E. Classic that cognitive

impairment after stroke is dementia, and Neiguan is the master of it. It is located at the highest part of the body and is the longest point of Yang Qi. Acupuncture here mobilizes Yang Qi throughout the body, accelerates the flow of blood throughout the body, and enhances the formation of positive Qi. This shows that acupuncture treatment has significant effect on the treatment of mental disorders. At present, there are three main types of acupuncture methods for treating post-stroke cognitive disorders, namely scalp acupuncture, brain-awakening acupuncture, and body acupuncture.

3.1. Scalp needle acupuncture method

In Chinese medicine, the head is the meeting of all the yang. Acupuncture of the cerebral cortex can stimulate the local acupuncture meridian centers of the head, and also activate the narrowed projection areas of various parts of the body in the head, strengthening the therapeutic effect on diseases. Cognitive dysfunction is extremely closely linked to the brain. Cognition is reflected in a person's memory, attention, responsiveness to things, and the ability to express one's emotions. The brain mainly controls the person's emotion and thinking ability, so in the clinical treatment of brain disorders most focus on acupuncture of the head. Head acupuncture also occupies the majority of acupuncture research reports. Some studies have shown that the seven-zone division method of Yu's head brain acupuncture points (dividing the head into seven zones, selecting the frontal, temporal, and parietal zones, needling flat times 1.5 inches below the capitellar tendon, 5 needles each in the frontal and parietal areas, 3 needles in the temporal area, and twisting rapidly at 200 times/min after acupuncture) can significantly improve the cognitive function of patients with Alzheimer's disease and have a beneficial impact on their lives [16-17]. Li Wei et al [18] showed that acupuncture of head points significantly improved cognitive impairment after stroke and improved patients' basic life skills by acupuncture of Baihui, Sishencong, Quchai, and Shenting. Zhang Jianbo et al [19] treated patients with cognitive impairment after cerebral infarction by acupuncture plus electroacupuncture, and after treatment, the patients' symptoms improved significantly, and the efficiency of the treatment group was much higher than that of the other groups. In conclusion, it can be seen that scalp acupuncture has significant efficacy in improving cognition.

3.2. Brain-awakening acupuncture

Waking up the brain and opening up the body hair was founded in 1972, and after several years of clinical exploration and practice, a more complete comprehensive system for the treatment of stroke has been formed, but there is still less research on its treatment of cognitive impairment. Shen Wei [20] et al. by observing the treatment of hypertensive cerebral hemorrhage patients by waking up the brain and opening up the body acupuncture, its therapeutic significance was obvious, and the effect of the treatment group was significantly better than that of the control group, concluding that waking up the brain and opening up the body acupuncture can effectively relieve cerebral hemorrhage and have a good improvement effect on hypertension. Shi Zhe [21] observed the efficacy of waking up the brain and opening up the body acupuncture method in the treatment of vascular dementia and confirmed its effect on improving cognition, emotion, memory and language. Cao Rui et al [22] used waking up the brain and opening up the body acupuncture to treat vascular dementia, and confirmed that waking up the brain and opening up the body acupuncture could improve vascular dementia. Zhang Jianfeng et al [23] used the awakening and enlightening acupuncture method to acupuncture Renzhong, Neiguan, Sanyinjiao, Zhizhong and Shouze, showing that there was statistical significance between the control group and the treatment group, which proved that the awakening and enlightening acupuncture method could improve mild cognitive impairment after stroke.

3.3. Body Needle

Body acupuncture, and acupuncture of meridians and acupuncture points in various parts of the body, is the opposite of ear acupuncture, etc. It was found that acupuncture of Baihui, Sishencong, Shenmen, Neiguan, Sanyinjiao, and Feosanli could improve blood supply and effectively alleviate cognitive function in patients with dementia [24]. Zhu Yonglei et al [25] selected Shuigou, Yintang, Shangxing, Baihui, and Shenting for acupuncture, which effectively alleviated cognitive impairment after stroke. Wu Wei et al [26] confirmed that acupuncture could alleviate the cognitive impairment and improve the daily self-care ability of patients.

Combined with the basic theory of Chinese medicine, meridians are the channels for the flow of qi and blood in the human body. The Ling Shu says, "The twelve meridians are deep and invisible between the flesh and the flesh. All the veins that are floating and common are also the meridians." Acupuncture this table, you can mobilize the body's internal and external organs of qi and blood running, to help the growth of positive qi, so as to protect against evil, improve cognitive function, improve memory, cognitive power, emotional expression ability, etc.

4. Moxibustion

Moxa is made of cotton strips wrapped with moxa wool, which is an external treatment method of Chinese medicine, moxibustion has the role of warming the menstruation and relieving pain, helping Yang to fix the pain, moving Qi and removing cold, etc. In today's life, there are also people who use moxibustion as a health care treatment. Moxibustion has the advantages of simple operation, safety, cheap, etc. It can make up for the inconvenience caused by needles and drugs, while moxibustion can mobilize the whole body Yang Qi, and cooperate with needles to strengthen the role of supporting positive Qi and resisting external evil moxibustion can also increase the circulation of blood and lymph, which can strengthen the spleen and kidney, replenish the middle energy and increase the absorption of nutrients, etc. Moxibustion of Baihui and Shenting can awaken the brain, benefit the qi and warm the yang, enhance the positive qi and strengthen the body. Moxibustion of acupuncture points accelerates the local flow of Qi and blood in the acupuncture points, increasing the production of positive Qi to defend against external evil. In addition, moxibustion can treat various acute and serious illnesses, tonic deficiency, and nourish and regulate chronic diseases. Existing studies on moxibustion are relatively few; therefore, the study of moxibustion on cognitive impairment after stroke can be enhanced in follow-up studies.

5. Outlook

In recent years, the incidence of stroke has gradually increased, and those affected are getting younger and younger. Post-stroke cognitive dysfunction poses a great danger to patients, their families and society. Treatment is more difficult and tedious than for other diseases, and requires great patience and confidence on the part of the patient, as well as careful care by the patient's family. Western medicine is relatively fast-acting, but the toxic side effects are large and long time taking is not good for patients' health. Chinese medicine has unique advantages in this regard, with less toxic side effects, more choices, and treatment based on evidence, and western medicine combined with Chinese medicine and acupuncture, which is simple and convenient with even greater effect. However, since the research on TCM for post-stroke cognitive impairment is not comprehensive and there are still questions about the mechanism of its therapeutic effect, therefore, in the follow-up studies, all groups of factors should be excluded and various studies on TCM for post-stroke cognitive impairment should be carried out comprehensively to maximize the advantages of TCM and provide more theoretical basis for the clinical treatment of post-stroke

cognitive impairment.

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