

# *Research progress of traditional Chinese medicine in children with cerebral palsy*

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**Abstract:** by summarizing the understanding and treatment experience of traditional Chinese medicine on cerebral palsy in recent years, this paper summarizes the different methods of traditional Chinese medicine in the treatment of cerebral palsy, affirms the effect of traditional Chinese medicine in the treatment of cerebral palsy, and further guides the clinical treatment.

## 1. Introduction

Cerebral palsy is a group of persistent central motor and postural development disorders with limited activity, including spastic quadriplegia, spastic diplegia, spastic hemiplegia, involuntary movement, ataxia and mixed type, with or without sensory and intellectual deficits, with a prevalence rate of 2‰ ~ 3.5‰ [1]. Some studies have shown that the prevalence of cerebral palsy has increased year by year, which has become the main factor of children's disability and brought a great burden to society and families. There is no name of "cerebral palsy" in ancient literature, but there are related descriptions, which belong to the categories of "five late", "five soft", "five hard", pediatric dementia, "impotence disease" and so on [2]. Because the etiology and pathogenesis of cerebral palsy are complex, there is no unified theory at present. Most scholars believe that cerebral palsy is located in the brain and related to the heart, liver, spleen and kidney. The pathogenesis is divided into congenital deficiency and acquired dystrophy. Congenital deficiency is due to the deficiency of physical factors and blood essence of parents, who cannot be fed, or because the mother is frightened during pregnancy, which leads to liver wind, or because they feel the mother's evil poison. Postnatal loss of nutrition, including postnatal drug-induced injury, improper feeding, feeling external pathogens and other factors.

## 2. Understanding of etiology and pathogenesis of cerebral palsy in traditional Chinese Medicine

### 2.1 Brain marrow emptiness is the pathological basis of cerebral palsy

Traditional Chinese medicine believes that "the brain governs the gods", which has been recorded in Su Wen · generation of five internal organs as early as, saying: "all marrow belong to the brain". Western medicine believes that the brain is the life activity center of the human body, which is in

charge of and regulates the physiological activities of the human body. By carefully observing the development of children's brain marrow, Wang Qingren of the Ming Dynasty believed that "the brain controls memory", and said: "children with no memory, the brain marrow is not full", which confirmed that the human brain has the functions of managing feeling, language, thinking and movement. Modern scholars Liu Yongping [3] and others conducted a retrospective study on 800 children with cerebral palsy. After statistics, they found that the disease is mainly deficiency, supplemented by the inclusion of deficiency and excess, while more than 75% of children with cerebral palsy are mainly brain marrow emptiness. They believe that most of the pathological basis of cerebral palsy is brain marrow emptiness.

## **2.2 Viscera deficiency is the main pathogenesis of cerebral palsy**

Traditional Chinese medicine believes that the disease lies in the brain, which is closely related to the spleen, kidney, liver and heart. "Lingshu · meridians" says: "when people are born, they first become essence, and then the brain marrow grows.". Essence and Qi is the basic material of human body and the material basis of various life activities of human body. The kidney controls the water and stores essence. Only when the essence and Qi are filled can it be transformed into marrow, the brain orifices can be nourished, and the physiological function of the brain as the "house of Yuanshen" can be brought into normal play. The liver dominates the tendons, the kidney stores essence, and the essence and blood of the liver and kidney are not sufficient, so the brain and marrow are empty, and there is mental retardation and inability to speak; The liver governs the tendons, the kidney governs the bone marrow, the liver and kidney lose, the tendons cannot bind the bone, the joint flexion and extension are unfavorable, and the bone is empty and withered; The spleen is the foundation of the day after tomorrow and governs the muscles of the whole body. If the spleen and kidney are deficient, the muscles and bones are weak and cannot be lifted; If the temper is weak, it can not inhibit the liver wood, causing hyperactivity of the liver and wind, or the liver is strong and the spleen is weak, the liver bullying is weak, aggravating the weakness of the spleen, resulting in limb rigidity and contracture, tough and useless. The heart hides the spirit and governs the blood vessels. If the heart and spleen are deficient, the limbs will be withered and soft, and the muscles will be relaxed; If the whole body is deficient in Qi and blood, phlegm and blood stasis block the brain collaterals, resulting in the loss of brain marrow; Children's "delicate lungs" are easy to feel external evil, which affects the function of viscera and Qi and blood, and can also cause cerebral palsy.

## **3. Treatment status of cerebral palsy in traditional Chinese Medicine**

At present, there are no specific drugs for the treatment of cerebral palsy at home and abroad. Modern medicine mainly focuses on rehabilitation training and functional recovery. Traditional Chinese medicine has its own unique advantages in the treatment of cerebral palsy, including acupuncture, massage, traditional Chinese medicine and so on.

### **3.1 Acupuncture treatment**

Acupuncture therapy is the most important method of traditional Chinese medicine in the treatment of infantile cerebral palsy. Acupuncture and moxibustion therapy has the functions of dredging meridians, harmonizing Yin and Yang, supporting righteousness and eliminating evil. Studies have proved that acupuncture and moxibustion in the treatment of cerebral palsy can improve the blood supply to the brain, promote the metabolism of brain tissue, repair damaged cells, promote differentiation and proliferation, accelerate the reconstruction of neural structure, and thus reconstruct the brain neural network. Zhou Hongtao [4] and others found that this method can promote the

improvement of children's development quotient and IQ, improve social living ability and sensory comprehensive ability, and has good safety. Liu Shaoyi [5] used acupuncture dialectical acupoint application to treat children with cerebral palsy. For those with insufficient fetal temperament and deficiency of kidney qi, Liu's nine acupoint acupuncture formula was used to treat Weiwei, so as to access Qi and blood, adjust the cardinal, honor the governor and benefit the marrow. It is the basic formula for the treatment of mental retardation and hand foot spasm; For those with deficiency of liver and kidney and wind movement due to yin deficiency, Liu's intersection eight pulse needling formula is adopted to achieve the curative effect of benefiting the kidney and liver, nourishing yin and relaxing tendons, and can treat all kinds of cerebral palsy; Those with weak spleen and kidney should supplement qi and strengthen the spleen, reconcile Ying and Wei, and use Liu's Tongda original Qi acupuncture to reduce the prescription, which is mainly used to treat the atrophy of hands and feet in children with cerebral palsy; Liu Shaoyi, a type of muscle and pulse loss, created Liu's lieduan Zhongzhu Dingjing needling prescription, which has obvious effect on patients with mental retardation with convulsion and epilepsy. Bao Xuefei [6] and others used meridian flow Najia acupuncture to treat spastic paralysis. The results showed that it could significantly improve children's gross motor function and muscle tension level, and improve children's daily life and activity ability. Fu Yuwei [7] and others used Lingnan scalp acupuncture to divide the head into four treatment areas: Yangming, Jueyin, Shaoyang and Taiyang. Syndrome differentiation and treatment, plus and minus compatibility can effectively improve cerebral blood perfusion and improve children's cognitive function. Professor Wu Xu [8] proposed the "kidney tonifying and brain strengthening acupuncture method". The five hearts are the hearts of both hands, feet, head, heavenly heart Baihui, human heart labor palace and earth center Yongquan, which are called "five heart acupoints", which stimulate the innate kidney qi, fill the lean marrow, awaken the brain and open the orifices. Some scholars [9] have studied the law of acupoint matching of acupuncture and moxibustion in the treatment of infantile cerebral palsy. Acupuncture and moxibustion in the treatment of cerebral palsy has the characteristics of paying attention to the selection of acupoints on the limbs and head, the selection of acupoints on the side of Chongyang meridian, the use of specific acupoints and the method of acupoint matching up and down. The top three meridians are Du meridian, foot Shaoyang gallbladder meridian and hand Yangming large intestine meridian. Zusanli, Baihui, Sishencong, Hegu, Quchi, Sanyinjiao and Yanglingquan are the most frequently used acupoints, Acupoint compatibility Baihui and Sishencong, Hegu and Zusanli, Quchi and Hegu are acupoint compatibility with high frequency in the treatment of cerebral palsy.

### 3.2 Massage treatment

Traditional Chinese medicine believes that massage therapy has the functions of dredging meridians, supporting righteousness and eliminating evil, promoting qi and activating blood circulation, smoothing joints, harmonizing Yin and Yang, opening orifices and refreshing. Modern research shows that massage can improve children's various dysfunction, including the effects of exercise, learning and memory, speech, digestion and respiratory function. It can effectively alleviate muscle spasm, reduce pain, improve blood circulation and improve the quality of life. Liu Shaoyi [10] believes that infantile cerebral palsy is caused by insufficient fetal temperament, deficiency of kidney qi and insufficient yuan spirit. The treatment has created "Liu Rongdu nine acupoint method" and "Liu's nine Acupoint Moxibustion formula for treating impotence", so as to benefit Qi and blood, moisten muscles and veins and honor brain marrow, with remarkable clinical effect. Professor Wang Xuefeng [11] believes that creating "six methods for the back" to treat children with cerebral palsy can not only develop the growth and development function of children with cerebral palsy, but also effectively improve the core stability function of children and improve their quality of life. Zhang

Jiankui [12] treated cerebral palsy by massage Du Mai and Jiaji points. He believed that Du Mai is the program and vital energy of the twelve meridians, which plays a leading and adjusting role in the operation of Qi and blood in the whole head, back and waist. In clinical practice, it was found that massage Du Mai and Jiaji points can not only improve blood circulation and excite nerves, but also coordinate spinal stability and enhance spinal strength, so as to enhance balance ability and improve motor function. Guo Yan [13] applied acupoint massage to treat children with cerebral palsy with salivation. According to the different muscle states around the mouth of children, inhibitory or excitatory massage techniques were used to stimulate acupoints, and oral and buccal acupoints such as Chengjiang, Dicang, Lianquan, Daying and buccal car were selected to improve the muscle state around the mouth and reduce salivation. The total effective rate was 88.9%, and the clinical effect was accurate. Fang Qian [14] and others applied the massage method of "leading belt and guiding air", which not only accurately corrected the force line of pelvis and lower limbs, improved the balance and coordination of walking ability, but also significantly improved the step length. Zeng Ting [15] used tension balance therapy to treat patients with spastic cerebral palsy. The research results show that this therapy can improve the comprehensive ability of patients, not only promote the recovery of motor ability, but also improve the satisfaction of parents.

### 3.3 Chinese medicine treatment

In view of the deficiency of congenital endowment and obstruction of orifices by phlegm and blood stasis, Liu Ying and others believe that it should be used to replenish Qi and blood, remove blood stasis and dredge collaterals, dispel phlegm and open orifices, use Kaiqiao Xingshen decoction, Astragalus membranaceus, Angelica sinensis and Achyranthes bidentata to replenish kidney, replenish qi and blood, Shichangpu, Gualou and dannanxing to dispel phlegm and open orifices, and rhubarb to remove blood stasis and dredge collaterals. For patients with deficiency of both spleen and kidney, Cai Xiaying [16] and others used Bushen Jianpi Decoction, in which Codonopsis pilosula, Astragalus membranaceus and Atractylodes macrocephala were used to replenish qi and strengthen spleen, pilose antler, Cornus officinalis, radix rehmanniae, Eucommia ulmoides and Huai yam were used to replenish kidney and essence, Salvia miltiorrhiza and Angelica were used to replenish blood and activate blood circulation, Acorus tatarinowii and Yizhiren were used to open the orifices and refresh the brain, and cohosh was used to clear Yang Qi and improve spleen, activate blood circulation and remove blood stasis, dredge. For spastic cerebral palsy with strong liver and weak spleen, Gao Shan [17] and others adopted Jianpi Shugan therapy, with Chaihu Shugan powder and Jianpi formula, which can significantly improve the clinical efficacy and quality of life of children. According to the clinical practice of "Phlegm and blood stasis block, obstruction through orifices" in children with cerebral palsy [18], it is proved that the use of "Jin Bing Pu Zhong Qi Qi" can block the phlegm and remove blood stasis, and the "Huo Bing Pu Zhong Qi" medicine can effectively reduce the tension of cerebral palsy. Liang Yanping [19] self-made Bushen Yipi decoction, which contains Codonopsis pilosula, Salvia miltiorrhiza, Huaishan yam, Paeonia alba, acanthopanax senticosus bark, Achyranthes bidentata, papaya and licorice. The clinical effective rate is 93.33%. Research shows that it can enhance the physical quality of children and improve brain function and motor function. In addition, traditional Chinese medicine fumigation is a traditional Chinese medicine external treatment method guided by the theory of traditional Chinese medicine, which uses the steam generated after Drug Decoction to achieve the purpose of treatment by fumigating the affected part of the body. It has the functions of regulating qi and blood, dredging meridians and improving local blood circulation. It has the advantages of convenient operation, low side effects and wide treatment range. Lin Biyu [20] used Shaoyao Gancao Decoction to fumigate and wash children with cerebral palsy, which can effectively alleviate muscle spasm and reduce muscle tension. Zhang Yan [21] found

in the clinical observation of the treatment of spastic cerebral palsy with traditional Chinese medicine antispasmodic formula bath that traditional Chinese medicine bath can reduce muscle tension and improve the treatment of limb spasm by promoting the heating of hypothalamus, improving the motor function of cerebral cortex and reducing the traction effect on muscles. The total effective rate is 100%. Liu Xiaoni [22] and others found that this combined method can effectively improve the standing biological force line of children with spastic cerebral palsy and improve the standing balance ability, so as to improve the walking gait.

### 3.4 Others

In the acupuncture therapy of traditional Chinese medicine, combined with drug treatment, a treatment method to achieve double stimulation of acupoints is called "water acupuncture therapy". Yao Xianhua [23] used acupoint injection of vitamin B12 to improve the symptoms of lumbar weakness in children with cerebral palsy, and selected the corresponding acupoints on the bladder meridian of foot sun and Du meridian. The research results show that this treatment method can effectively improve the strength of lumbar muscles, enhance the balance ability and promote the recovery of exercise ability. In addition, acupoint catgut embedding therapy is developed on the basis of acupuncture theory of traditional Chinese medicine. By embedding surgical suture or catgut into acupoints and using the continuous stimulation of acupoints, it can achieve the purpose of treatment. This treatment method integrates acupoint sealing effect, acupuncture effect and needle retention effect, and has achieved certain curative effect in the treatment of cerebral palsy. Zhang Yan [24] treated spastic cerebral palsy by Catgut Embedding at Du meridian points. Taking shenting, naohu, Baihui, Dazhui, Shendao, Mingmen and Yaoyangguan can permanently consolidate and improve muscle tension and posture abnormalities. Jin bingxu [25] and others selected shoulder, shoulder, Tianzong, Tianshu and Huatuo Jiaji for acupoint catgut embedding, which can effectively inhibit the primitive reflex of children with involuntary motor cerebral palsy and significantly improve the sitting ability, with an effective rate of 90.9%. In recent years, traditional Chinese medicine needle knife minimally invasive technology has been gradually applied to the treatment of cerebral palsy. Its main purpose is to relieve muscle spasm and reduce muscle tension. Liang Chunguang [26] used needle knife minimally invasive technology to selectively cut and release the points with high gastrocnemius muscle tension for spastic cerebral palsy walking disorder, which effectively relieved the gastrocnemius muscle spasm and significantly improved the limitation of ankle dorsiflexion, so as to improve the ability of children to walk and stand. In addition, traditional Chinese medicine treatment methods include acupoint application, auricular point application and wax therapy, which have made some progress and curative effect in the treatment of cerebral palsy [27-29]. At present, the best way to treat cerebral palsy is comprehensive therapy, which has the advantages of fast curative effect and good long-term effect than any single therapy. For example, Yang Xiaohui [30] and others used comprehensive therapies such as traditional Chinese medicine, acupuncture, massage, medicine bath and acupoint catgut embedding to treat spastic cerebral palsy. This comprehensive therapy can significantly improve the motor function, body balance and living ability of children with CP, and the effect is better than that of single therapy. Wang Heqiang [31] and others used the triple therapy of traditional Chinese medicine fumigation, chiropractic and scalp acupuncture combined with modern rehabilitation treatment. The results show that the comprehensive therapy can effectively improve various indexes such as three-dimensional gait space-time and surface electromyography, and improve the walking ability of children.

## 4. Conclusion

Infantile cerebral palsy is a serious disease that affects children's normal growth and development.

The treatment is difficult and brings a heavy burden to the family economy and society. In recent decades, traditional Chinese medicine has been constantly exploring the treatment of cerebral palsy, showing obvious advantages. Its curative effect has been generally recognized by clinicians. In the future, we can further explore the curative effect of traditional Chinese medicine in the treatment of cerebral palsy.

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