

Application on pediatric spastic cerebral palsy pointed feet

Ya Zhao ¹, Hujie Song ²

¹Shaanxi University of Traditional Chinese Medicine, Xianyang Shaanxi 712000, China;

²Xi'an Encephalopathy Hospital of Traditional Chinese Medicine, Xi'an Shaanxi 710034, China;

Abstract

Objective:To explore the clinical effect of traditional Chinese medicine application along meridian to improve acute foot of infantile spastic cerebral palsy. **Methods:** 62 patients with spastic cerebral palsy with pointed foot were selected. 31 cases in the control group were treated with conventional rehabilitation methods. 31 cases in the treatment group were treated with traditional Chinese medicine application along meridians on the basis of the control group. **Results:**After treatment, the total effective rate of the treatment group was higher than that of the control group, and the dorsiflexion angle of foot, CSI and toe score were all improved and better than those of the control group ($P < 0.01$). **CONCLUSION:** Traditional Chinese medicine application along meridian has obvious curative effect on spastic cerebral palsy with pointed foot, which is worthy of clinical application.

Keywords

Spastic cerebral palsy, Pointy feet, Chinese medicine patch.

1. Introduction

Cerebral palsy (CP) is referred to as "cerebral palsy", which is mostly caused by developmental defects or non progressive brain damage caused by several reasons. Clinically, it is mainly manifested by persistent central dyskinesia, with or without epilepsy, sensory perception, language disorders, intellectual defects and other symptoms [1]. According to the classification of dyskinesia, cerebral palsy can be divided into the following types: spastic diplegia, spastic hemiplegia, spastic quadriplegia, involuntary movement, ataxia and mixed type [2]. The incidence rate of cerebral palsy has been increasing in recent years. In China, the main type of cerebral palsy is spastic cerebral palsy, and its incidence rate is about 65%[3]. Contracture cerebral palsy is mainly caused by the injury of vertebral tract in the motor area of cerebral cortex, which is characterized by hypermyosis, tension and spasm. According to 2015 "cerebral palsy rehabilitation guidelines", according to the level of motor function: Grade I, grade II, grade III, grade IV, grade v. Clinically, spastic cerebral palsy often appears abnormal walking posture, which is mainly caused by muscle spasm, increased muscle tension and muscle rigidity [4]. If the spastic cerebral palsy acutep is not treated actively and effectively in time, the prognosis is poor, and it is easy to have a higher teratogenesis rate. In this study, 31 cases of children with spastic cerebral palsy with sharp feet were treated by TCM sticking along the meridian, and good clinical effect was achieved:

2. Method

2.1. Research objects

62 children who met the inclusion and did not meet the exclusion criteria were selected as the research object. 62 cases were randomly divided into control group and treatment group, 31 cases in each group. The treatment group had 16 males and 15 females, aged 1-6 years, with an

average of 3.22 ± 1.54) years old; The average age of the control group was 17 males and 14 females, aged 1-6 years (3.16 ± 1.77) years old. According to the general data of age and sex, $P > 0.05$, the difference was not statistically significant and comparable.

2.2. Inclusion criteria

2.2.1.

All of them meet the clinical diagnosis standard of cerebral palsy [5]:

Prerequisites:

I. the central motor disorders persist,

II. Abnormal posture,

III. Dystonia,

IV. abnormal reflection,

Reference conditions:

I. It has etiological basis for cerebral palsy,

2. There are abnormal electrophysiological and imaging auxiliary examination basis.

2.2.2.

The acupunctus showed different degrees in clinical.

2.2.3.

The age is between 1 and 6 years old.

2.2.4.

In the past year, no anti spasm treatment was performed, such as oral anti spasm drugs, botulin injection and surgical treatment.

2.2.5.

Inform the family members of the child of the treatment plan and related precautions, obtain the consent of the family members and sign the informed consent. In addition, the treatment program has been approved by the medical ethics committee and conforms to the ethical principles.

2.3. Exclusion standard value

2.3.1.

Cuspidation caused by other reasons.

2.3.2.

Serious diseases of heart, lung, kidney and other important organs, hydrocephalus and brain occupying lesions, etc.

2.3.3.

Those who are allergic to Chinese medicine or intolerable to the treatment of traditional Chinese medicine.

2.3.4.

Children with severe epilepsy or frequent epilepsy.

2.4. Standards for removal and shedding

Interruption of treatment due to poor compliance or other reasons, more than 1 week.

Children who have participated in the treatment but failed to treat according to the specified treatment plan.

Other complications occurred during the treatment.

The observation index record is incomplete, which affects the later evaluation of curative effect.

2.5. Treatment

2.5.1. Control group

Combined with the specific condition of the children, the control group received the corresponding routine rehabilitation treatment. On the one hand, TCM methods such as massage and acupuncture were adopted. On the other hand, physical therapy (PT) is used in rehabilitation. The above routine rehabilitation treatment was conducted once a day for 6 consecutive days a week for 3 consecutive months.

2.5.2. Treatment group

On the basis of the conventional treatment of the control group, the treatment group added the application of traditional Chinese medicine along the meridians. The specific contents are as follows: ① self-developed "spasticity paste" agreement formula, which can soften the liver, strengthen the spleen, relax the tendons and dredge the collaterals. The specific composition of spasticity paste is as follows: *Atractylodes macrocephala* 15g, *Paeonia lactiflora* 15g, *Chuanxiong* 15g, *chuanniuxi* 20g, *jixueteng* 15g, *Shenjincao* 30g, *Tougucao* 30g, *Aiye* 30g, *Sangzhi* 15g, *nux vomica* 2G *Camphor* 1g; ② Selection of acupoints along meridians: first, select Pishu (spine area, under the spinous process of the 11th thoracic vertebra, 1.5 inches beside the posterior median line), Ganshu (spine area, under the spinous process of the 9th thoracic vertebra, 1.5 inches beside the posterior median line), Sanyinjiao (inner side of the leg, 3 inches above the tip of the medial malleolus, posterior border of the medial edge of the tibia), Xuehai (anterior femoral area, 2 inches above the medial end of the patella, eminence of the medial femoral muscle), Yanglingquan (outer side of the leg, 2 inches above the medial end of the patella, eminence of the medial femoral muscle), At the anterior and lower part of fibula capitulum; Secondly, select the location of meridian contracture: select the meridian area from Weizhong point to Chengshan point along the bladder meridian, namely Weizhong point (posterior knee area, midpoint of popliteal transverse striation), Weiyang point (on popliteal transverse striation, medial edge of biceps femoris tendon), Chengjin point (between Heyang and Chengshan, take the point from the center of gastrocnemius abdominis), Chengshan point (posterior leg area, intersection of gastrocnemius abdominis and tendon). ③ Application methods and precautions: first, accurate acupoint positioning, secondly, before the implementation of traditional Chinese medicine application, the application area needs to be locally disinfected, and finally the application time is 6 hours, once a day, 6 days a week, continuous application for 3 months.

2.6. Course of treatment

The treatment group and the control group were treated for a period of 3 months. During the treatment, the relevant basic examination should be carried out, and the relevant index data should be recorded. After the treatment, the patients were followed up for 1 month.

2.7. Observation and clinical efficacy index

2.7.1. General information

- ① Statistical data: age, gender, weight, height.
- ② History: current history, past history, allergic history, family history.

2.7.2. Efficacy index

(1) Foot dorsiflexion angle: the child takes the supine position, so that the child's foot is in a dorsiflexion state, and records the angle change process from the neutral position to the foot dorsiflexion direction, that is, the degree of flexion. Generally, the degree of normal buckling is 45° about. With the increase of muscle tension, the flexion angle decreased; The muscle tension decreased and the angle increased[6].

(2) CSI (clinical spasm index): the lower limb spasm is generally evaluated by CSI, which includes: muscle tension of triceps cruris, Achilles tendon reflex and ankle clonus [7].

(3) The standard of toe score: 0: no change of toe fixation; 1 point: the pointed foot was not fixed, but the pointed foot appeared during exercise. 2 points: the pointed foot was not fixed, and sometimes showed pointed foot during exercise. 3 points: the heel can land normally [8].

2.7.3. Scoring criteria [9]

Normalization: walking alone ≥ 3 m, dorsiflexion angle at $70^\circ \sim$ seventy-five $^\circ$ Within the range, there was no abnormality in the sharp foot score of 3 points or walking posture; Remarkable effect: when walking independently, the toe points to the ground, and the dorsum flexion angle of foot decreases by more than 10° The improvement degree of sharp foot score was more than or equal to 2 points; Effective: stand on tiptoe, foot back flexion angle reduced in $5^\circ \sim$ nine $^\circ$ The degree of improvement in the range or sharp foot score was more than or equal to 1 point; Invalid: the data recorded in the test results showed that there was no change in dorsiflexion angle or sharp foot score. Total effective rate = (effective + markedly effective + normalized cases) / total number of cases $\times 100\%$.

3. Statistical method

Spss25.0 software was used to establish the database and input the relevant index data of the treatment group and the control group; the counting data were analyzed by chi square test, and the measurement data were expressed by $\pm s$ and t test. Independent sample t-test was used for different feet, and paired sample t-test was used for comparison within the same group. $P < 0.05$ means the difference is statistically significant.

4. Results

4.1. Comparison of foot dorsiflexion angle between two groups before and after treatment

There was no significant difference in dorsiflexion angle between the two groups before treatment ($P > 0.05$). After treatment, the difference of dorsiflexion angle between the two groups was statistically significant. ($t = 2.85$, $P < 0.05$). After treatment, the effect of the treatment group was better, and the difference was statistically significant ($t = 15.37$, $P < 0.05$). See Table 1

Table 1: Comparison of dorsiflexion angle scores between the two groups before and after treatment ($\bar{x} \pm S$)

group	category	Treatment Before	After treatment
Control group	31	90.84 \pm 3.81	80.10 \pm 4.32
Treatment group	31	91.29 \pm 3.77	77.32 \pm 3.37

Note: compared with before treatment, $P < 0.01$; compared with the control group, $P < 0.01$

4.2. Comparison of CSI between the two groups before and after treatment

There was no significant difference in CSI score between the two groups before treatment ($P > 0.05$). After treatment, the difference of CSI score between the two groups was statistically significant. ($t = 4.18$, $P < 0.05$). After treatment, the effect of the treatment group was better, and the difference was statistically significant ($t = 11.42$, $P < 0.05$). See Table 2

Table 2: Comparison of CSI scores between the two groups before and after treatment ($\bar{x} \pm S$)

group	category	Treatment Before	After treatment
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Control group	31	9.87±1.66	7.58±1.72
Treatment group	31	10.29±1.67	5.97±1.27

Note: compared with before treatment, $P < 0.01$; compared with the control group, $P < 0.01$

4.3. Comparison of toe score before and after treatment in the two groups

Before the treatment, there was no significant difference in toe score between the two groups ($P > 0.05$). The difference of toe score between the two groups was statistically significant. ($t = 5.36$, $P < 0.05$), suggesting that the traditional Chinese medicine application is better than the conventional treatment. The results of the treatment group were better than before and after treatment, and the difference was statistically significant ($t = 12.31$, $P < 0.05$). See Table 3

Table 3: Comparison of toe score between the two groups before and after treatment ($\bar{x} \pm S$)

group	category	Treatment Before	After treatment
Control group	31	0.61±0.71	1.29±0.78
Treatment group	31	0.55±0.62	2.03±0.70

Note: compared with before treatment, $P < 0.01$; compared with the control group, $P < 0.01$

4.4. Comparison of clinical efficacy between the two groups after treatment

After treatment, the effective rate of the treatment group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$). See Table 4

Table 4: Comparison of treatment effective rate between the two groups (n,%)

group	category	normalization	remarkable effect	effective	invalid	Total effective rate
Control group	31	2	9	14	6	80.65%
Treatment group	31	10	14	16	1	96.77%

5. Discussion

Modern medicine's understanding of the pathogenesis of cerebral palsy is mainly cerebral hypoxia, which can lead to incomplete myelin sheath formation in the developing brain, followed by hemorrhage, trauma, vascular embolism, poisoning or infection [10]. There is no concept of "cerebral palsy" in traditional Chinese medicine, which is classified as "five late", "five soft", "five hard" and "flaccid syndrome". Traditional Chinese medicine believes that the viscera related to spastic cerebral palsy include liver, spleen and kidney. Liver dominates tendons, spleen dominates muscles, kidney dominates bone, and "brain is sea of marrow" [11]. Liver dominates tendons because tendons depend on the nourishment of Qi and blood of liver; Spleen is the source of Qi and blood. The spleen transports the essence of water and grain to the whole body to nourish the muscles and limbs. The innate origin of kidney and the acquired origin of spleen, together with the liver's function of regulating and dispersing, can nourish and regulate the medullary sea. According to its clinical manifestations, spastic cerebral palsy mostly belongs to the type of strong liver and weak spleen [12]. Liver Yin can not restrict liver Yang and lead to hyperactivity of liver yang. Liver wind is easy to move inside. The clinical manifestations are tremor of hands and feet, convulsion, dizziness and brain swelling. If the spleen qi is weak and the movement and transformation of Qi and blood are lost, the Qi and blood are deficient and the muscles of the extremities can not be nurtured. The clinical

manifestations are that the flexion and extension are unfavorable and the muscles are weak and can not be used. In addition, in the theory of five elements, there is ganmukepitu. When the liver is strong and the spleen is weak, it can lead to ganmuchengpitu. Clinically, it can lead to limb spasm and ankylosis. Spasm and ankylosis can lead to poor operation of Qi and blood, and then blood stasis, which further aggravates the ankylosis of the limb. In the lower limb, it can show sharp foot. In terms of treatment, according to its etiology and pathogenesis, children with spastic cerebral palsy should emphasize the liver, spleen and kidney, so external use of traditional Chinese medicine should focus on the selection of drugs for liver, spleen and kidney. Most of the selected drugs of self-made spasticity paste belong to liver, spleen and kidney, which have the functions of dispelling wind and dredging collaterals, tonifying qi and blood, promoting blood circulation and removing blood stasis, nourishing blood and softening liver, strengthening spleen, etc. *Atractylodes macrocephala* has the advantages of diuresis and detumescence, surface consolidation and antiperspiration, dampness dryness and spleen strengthening; Both *Radix Paeoniae Alba* and *Radix Angelicae Sinensis* have the effects of tonifying blood, softening liver and relieving pain; *Shenjincao* has the functions of dredging meridians and collaterals, relaxing tendons and bones, relieving swelling and pain, while *Tougucao* has the functions of dispelling wind and removing dampness, relaxing tendons and promoting blood circulation, and dredging joints; *Achyranthes bidentata* has the function of removing blood stasis, dredging channels and joints; *Caulis Spatholobi* has the functions of promoting blood circulation, invigorating blood circulation, relaxing channels and activating collaterals; *Ligusticum chuanxiong* can promote blood circulation and qi circulation, dispel wind and relieve pain; *Artemisia argyi* leaves dispel cold and relieve pain, dispel dampness and stop itching; *Ramulus Mori* has the function of dispelling wind dampness and benefiting joints; *Nux vomica* has the functions of dredging collaterals to relieve pain, detumescence and dispersing knots; Camphor can remove dampness and kill insects, warm powder can relieve pain, open orifices and expel filth. In the selection of acupoints along the meridians, the principle of acupuncture and moxibustion was referred. According to the Huangdi's principle of "treating flaccidity by Yangming alone" and the principle of selecting acupoints near the acupoints in acupuncture and moxibustion, namely "where Shu points are, where indications are", the meridian region from Weizhong point to Chengshan point corresponding to the upper and lower limbs of the bladder meridian of Foot Yangming is selected; Ganshu and Pishu were selected to soothe the liver and invigorate the spleen; Select Sanyinjiao and Xuehai to regulate qi and blood; Yanglingquan is the Xiahe point of Dan and the Jinhui point of Bahui. Yanglingquan is selected to treat lower limb paralysis and numbness. The results of this study confirmed the clinical efficacy of TCM application along the meridians. Compared with before treatment and after treatment in the control group, the treatment group's dorsiflexion angle, CSI and toe score were significantly improved, and the effective rate of the treatment group was higher than that of the control group. The clinical symptoms of the treatment group were significantly improved, and the difference was statistically significant ($P < 0.01$).

To sum up, the application of traditional Chinese medicine along meridians provides a new idea for the treatment of spastic cerebral palsy with sharp feet, and improves the clinical efficacy. Compared with the simple conventional treatment of spastic cerebral palsy with sharp feet, the effect is significant, which is worthy of promotion and implementation in clinical work.

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