

# Effect of Acupuncture at Lumbar Huatuo Jiaji Point Combined with Exercise Rehabilitation on Sitting Ability of Children with Cerebral Palsy

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**Abstract:** Objective: To provide a new method for improving the sitting ability of children with cerebral palsy by using traditional acupuncture at the lumbar Huatuo Jiaji point combined with exercise rehabilitation. Methods: A total of 30 children with cerebral palsy aged 1-3 years old who were admitted to the Children's Rehabilitation Center of rehabilitation Medicine Department of Jingzhou First People's Hospital from June 2020 to February 2022 were selected as the research objects, and they were divided into observation group (n = 15) and control group (N = 15). GMF 88 gross motor Rating Scale and sitting ability (LSS) grading were performed in both groups. Observation group only routine exercise rehabilitation training. The control group was treated with acupuncture at lumbar Huatuo Jiaji point on the basis of exercise rehabilitation. 2 groups, once a day, 10 times a course of treatment. The next course of treatment was continued at an interval of 1 week, and the treatment lasted for 3 courses. Before and after treatment, the sitting function area (B) and sitting ability (LSS) of GMF88 gross motor function assessment were evaluated, and the differences were compared. Results: In the first course of treatment, there was no statistical significance in the total effective rate between the observation group and the control group ( $P > 0.05$ ). After the second and third courses of treatment, the total effective rate in control group was higher than that in observation group, and the difference was statistically significant ( $P < 0.05$ ). Conclusion: Acupuncture at lumbar Huatuo Jiaji point combined with exercise therapy can significantly improve the sitting ability of children with cerebral palsy.

**Keywords:** Hua Tuo Jiaji point, Sports rehabilitation, Cerebral palsy, Seat capacity.

## 1. The Preface

Pediatric cerebral palsy (CEREBRAL palsy, CP) is a serious threat to children's health of the main disabling diseases, mainly in the fetal and neonatal period of the brain tissue injury necrosis caused by cerebral paralysis, The movement function of children and abnormal posture, etc [1] cerebral palsy have a lot of accompanied with the symptoms and cause big movement dysfunction related to abnormal seat is one of the common movement disorder children with cerebral palsy, because children with upper limb tension after stretching, head back posture control disorders, such as the stability of the seat ability is extremely difficult, won the seat capacity is one of the key conditions of independent walking, Therefore, the ability to sit is the key and difficult point in the rehabilitation of all children with cerebral palsy. We used lumbar Huatuo Jiaji point combined with conventional exercise rehabilitation therapy to treat 15 cases of pediatric cerebral palsy, and compared with conventional rehabilitation therapy to treat 15 cases of pediatric cerebral palsy, the results are summarized as follows.

## 2. Data and Methods

### 2.1. General Information

Methods thirty children with cerebral palsy treated in the Children's Rehabilitation Center of rehabilitation Medicine Department of Jingzhou First People's Hospital from June 2020 to February 2022 were selected as the research subjects. According to the time of admission, they were divided into observation group and control group successively, 15 cases in each group, 8 cases in males and 7 cases in females in the

observation group. In the control group, there were 15 cases, including 9 males and 6 females. There was no significant difference in general data between the two groups ( $P > 0.05$ ). This study was carried out after the approval of the Ethics Committee of Jingzhou First People's Hospital and the consent of the children's families. Diagnostic criteria: The diagnostic criteria of western medicine for children with cerebral palsy were formulated in the Minutes of the National Symposium on Pediatric Cerebral palsy in 2004, and the diagnostic criteria of cerebral palsy in The Chinese Cerebral Palsy Rehabilitation Guidelines (2015) were referred to [2]. Inclusion criteria: meeting diagnostic criteria; No gender limitation, 1-3 years old; Gross motor function assessment (GMFM) B energy area  $< 35$  points (after conversion); No epilepsy or in the stable stage of epilepsy; No serious mental retardation or communication disorder; The guardian voluntarily took the test and signed the informed consent. Exclusion criteria.

### 2.2. Treatment Methods

Children in both groups received Bobath therapy and Vojta technique, which included passive extension training of major joints and small joints of the trunk, head-controlled supine position to sitting up training, supine position to prone position body axis rotation training, children's roller sitting forward and backward movement training, barbitum ball sitting back and forward training and other core stability training. At the same time, enhanced head control such as bridge training stimulates spinal extension, With the equipment Bobath ball dive training, inhibit the tension of the extensor dorsi and other abnormal posture training; Children to the wedge-shaped plate supine holding ball training or

sitting position holding ball posture, SET suspension and other inhibition of head tilt; Supine pulled one hand lead to lateral protection, side ZuoWeiTi axis swing in succession, crook axis swing, lie on your back up enhancement waist abdomen muscle strength, enhance the body seat stand straight when the stability of active control ability and the training of core muscle group which leads to the seat after the balance of the side protection ability of development, at the same time, the therapist's own control with the pelvis stable training, such as the child straddles the therapist on the legs, Therapists use double lower limbs of ups and downs height adjustment, thus promotes the child seat when the torso to keep itself in dynamic and static stability of training, at the same time strengthen improve the separation of the pelvic girdle, coordinated control core muscles of the torso muscles and strengthen muscle strength training and induction of the child seat back before the establishment of the party to protect balance reaction [3]。 Once a day for 45 minutes, five times a week. Two weeks for a course of treatment. After one course of treatment, continue to the next course of treatment one week after the end of 3 sessions. In the control group, on the basis of routine training, huatuo Jiaji lumbar points [(L) 1, L4] were added, and the acupuncture needles of 1-2 inch Huatuo brand of 0.25 were used to directly puncture the children's lumbar points relative to Huatuo Jiaji, which was not limited according to the number of needles of the children's body length. The use of flat reinforcing flat reducing method and the twisting technique, so that the sense of needle conduction along the spine. Acupuncture lasts for 30 minutes once a day. One course of treatment is 10 times. One week after the end of the treatment course, continue to the next course, continuous treatment for 3 courses.

### 2.3. Evaluation Methods

Sitting ability Grading Scale (LSS) : the sitting ability of children with cerebral palsy was divided into eight grades. L1: head control upright and trunk upright were not established in sitting position. L2: When the therapist assists the child in sitting position, the child's head controls the upright position for 30 seconds. L3: When the therapist assisted sitting, the child's trunk stood up straight for 30 seconds; L4: The child

only needs to assist the pelvic sitting can be maintained for 30 seconds; L5: Children are not deficient to assist self-sitting alone for 30 seconds but cannot complete postural movement; L6: Children can sit alone for 30 seconds and can take objects and sit forward; L7: The child can sit alone for 30 seconds and can move laterally and the lateral protection reflex can be extracted; L8: The child can sit alone for 30 seconds and can move backward with posterior reflex elicits. The higher the LSS grade is, the better the function of the child is, the better the sitting ability is.

The GMFM score consists of 88 items, with the total original score of 60 points in the B sitting area. The final physician evaluation result is the percentage of points converted from the original full score of 100 points for each area. The higher the percentage score of a certain area, the more perfect the gross motor function building ability of a certain area. Clinical efficacy evaluation: the total percentage of GMFM B energy zone increased by  $\geq 15\%$ , indicating significant effect; It is effective to increase the total percentage of GMFM B energy region by less than 15%. No change in the total percentage of GMFM B energy is considered invalid.

### 2.4. Statistical Methods

The measurement data were expressed by mean  $\pm$  standard deviation ( $X \pm S$ ), t-test was used for comparison between groups, and paired T-test was used for comparison between groups.

## 3. The Results

3.1 30 cases were included in the statistics, and no cases were omitted.

3.2 Comparison of LSS grade between the two groups before and after treatment: there was no significant difference in LSS grade between the two groups before treatment ( $P > 0.5$ ), and the sitting ability of LSS grade between the two groups after treatment improved compared with that before treatment ( $P < 0.01$ ). After treatment, the number of cases with improved LSS grading sitting ability increased in the control group ( $P < 0.01$ ). See table 1

**Table 1.** Comparison of LSS grade between the two groups of children with cerebral palsy before and after treatment (cases)

group	number of cases	L1	L2	L3	L4	L5	L6
Observation group	Before treatment	7	9	6	7	0	1
	After treatment	5	3	7	9	1	1
control group	Before treatment	6	10	4	5	9	2
	After treatment	2	5	10	12	0	4

3.3 Comparison of gross motor function between the two groups of children with cerebral palsy: before treatment, there was no significant difference in GMFM88 and gross motor function score in B area (sitting position) between the two groups ( $P > 0.05$ ). After 3 courses of exercise rehabilitation treatment and exercise rehabilitation combined with

acupuncture at lumbar Huatuo Jiaji point, GMFM88 and ZONE B scores of the control group were significantly higher than before treatment ( $P < 0.05$ ). After treatment, gM-FM88 and GROSS motor function score in B area in the control group was higher than that in the observation group, and the difference was statistically significant ( $P < 0.05$ ). See table 2.

**Table 2.** Comparison of "GMFM sitting energy area" between the observation group and the control group before and after treatment

group	Before the treatment	After treatment	P values
Observation group	32.76 ± 14.98	58.26 ± 16.79	0.0002
control group	32.69 ± 13.31	75.26 ± 13.58	4.16 × 10 <sup>-9</sup>
P values	0.99	0.006	

#### 4. Please

Cerebral palsy is one of a group of diseases that are easy to occur in neonates. It is a persistent syndrome of central motor and postural dysplasia and restricted movement. Abnormal asymmetric and uncoordinated movement patterns are the main core manifestations of cerebral palsy. [5] Trunk core strength and pelvic stability training is to strengthen the strength and coordination of the major muscles, small muscles, connective tissues and ligaments located in the core of the trunk and pelvic belt. According to the normal neurological development of children, children's ability to crawl, stand and walk is based on the establishment and improvement of sitting ability. Whether the children get the balance and stability of sitting position is the key to affect the gait stability of children with cerebral palsy in the future. Bobath therapy, Vojta technology and other therapies are currently internationally recognized as the most effective treatment for cerebral palsy. It is mainly to inhibit the original reflex mode, promote coordination ability, improve self-discipline and voluntary movement to strengthen the stability of the pelvis and trunk and the separation of the whole pelvic belt, coordinate and control the muscle groups of the trunk to carry out the dynamic and static balance training, and promote the establishment of the sitting balance protection response. It also plays an important role in inhibiting abnormal postural response.

Traditional Chinese medicine in the very early treatment of pediatric cerebral palsy means, such as Chinese medicine treatment and acupuncture treatment, acupuncture treatment to the liver meridian, kidney meridian and trunk Huatuo jiaji acupoint, because the Chinese doctors think that "liver main body fascia, and limb movement related. The liver is full of qi and blood, and the fascia is nourished by it, so the muscles are strong and the movement is flexible. The kidney is the main bone, the bone gives birth to the marrow, the marrow gives birth to the brain, and the brain marrow is insufficient, resulting in the backward development of motor function [6]. Chinese medicine according to all kinds of doctors ancient books recorded "five late, five soft" children's clinical manifestations, mostly attributed to liver and kidney deficiency, congenital deficiency, qi is not filled and other reasons, there are also doctors think that the disease is located in the liver and kidney, mind is related to the heart and brain, syndrome is the disease syndrome of this deficiency.

The earliest use of Hua Tuo jiaji point was in <<Su Wen>>, Stabbing Malaria. The text said: "Twelve malarians... He who has the knight-errant ridge below the knight-errant ridge will have it." Yang Note also mentioned in <<Taisu>> Miu's Discussion on Acupuncture: "The spine has 21 vertebrae. If you hold the spine with both hands as the vertebrae, according to the pain point, it is the network of the foot sun, and there

are three punctures on each side YONG" [7]. The earliest explicit positioning was Ge Hong's "Elbow Reserve Urgent Prescription, Volume ii" in jin Dynasty. Mr. Li Ding, a master of modern Chinese medicine, redefined the special positioning of Huatuo jiaji on the viscera and Back Shu, and studied the original theory of Huatuo jiaji and changed the rationality of the positioning of The Back Shu in <<Ming Tang Jing>>. First of all, he recognized the title of "Huatuo Jiaji acupoint", And positioned in the thoracolumbar back, the first thoracic vertebra to the fifth lumbar spinous process on both sides of the lower side, each spinous process open 0.5 inch, From top to bottom on one side of the 17th hole, a total of 34 holes on both sides, on both sides of his 34 points in du meridian and approved by both the bladder full sun, and the du meridian and bladder linked by the department of Chinese medicine foundation put forward the theory of Yin and Yang are collectively referred to as "back to Yang" is, of which the third branch of du meridian and bladder with screwdriver continue, row to the forehead, the vertex of the head SEC, In the next section, along the scapula, both sides of the spine, to the waist, into the muscles on both sides of the spine, and finally qi and kidney connection. Archaisms cloud: "Travelers and interlinked, its collaterals in-depth" on either side of the spine, so du meridian and bladder by the connectivity in the courses, and sufficient sun bladder by the meridians, acupuncture points for more channels and collaterals, and from head to foot throughout a long channels and collaterals, du meridian at the same time the governor for "the sea of Yang pulse" is by the twelve meridians ZhongYang, two courses of arteries and veins and winding in the brain at the same time, Yang Yang meridians and collaterals in the back, it can be said that the two veins are closely linked in the cycle, related to each other in the indication of disease, jiaji point location is just in the du vein and foot sun bladder meridian gas transfer and extension of overlapping coverage area, so jiaji point and this communication of two veins, with the role of regulating two veins. Modern Western medicine has also conducted clinical studies at the same time [8]. It has been confirmed that acupuncture at Jiaji point can stimulate the anterior and posterior branches of the spinal nerve and sympathetic nerve trunk after the needle tip is inserted into the erector spine muscle along both sides of the spinous process and enters the corresponding area, which has been recognized as curative effect in clinical treatment, especially for nerve injury diseases. At the same time, acupuncture jiaji point can also play a role in regulating the integration of du meridian and bladder meridian.

The results of this study showed that at the end of treatment, both groups of children with cerebral palsy had improved sitting LSS grade at different levels, and GMFM88 B(sitting) energy zone score also increased. The efficacy of the control group was significantly better than that of the observation group after evaluation, and the comparison before and after

showed that both therapies were effective treatments. However, sports rehabilitation training combined with acupuncture at lumbar Huatuo Jiaji point is more effective. In tracking in the whole process of the control group in children with cerebral palsy, found no cerebral palsy after a needle waist clip ridge treatment period appear excitant phenomenon such as tension and abnormal posture and muscle tone is aggravating, the control group after treatment of 3 children with energy efficiency after acupuncture to stimulate the nerve and the feeling of the stretch reflex device, gradually reduce the waist and back muscle tension, so that the original reflection disappeared, Abnormal posture was improved. Especially for some children with positive head tilt and asymmetric tension neck reflex to get different degrees of relief, the therapist chooses Bobath technique training for children when doing sports rehabilitation, the children will be more relaxed, the guidance of autonomous coordination will be higher, and the trunk control ability and sitting balance ability will improve more obvious progress. In addition, all the children in the control group had no obvious infection, local pain and swelling after acupuncture, which also proves that the clinical application of Huatuo Jiaji point is safe and worthy of vigorous promotion in clinical practice.

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