

Clinical observation on acupuncture at thirteen ghost acupoints for children with autism spectrum disorder

针刺十三鬼穴治疗儿童孤独症谱系障碍的临床观察

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Abstract

Objective: To observe the clinical efficacy of needling thirteen ghost acupoints for children with autism spectrum disorder.

Methods: A total of 90 cases with autism spectrum disorder (ASD) aged between 2 and 6 years were randomly allocated into 2 groups by random number table. The control group ($n=45$) received routine rehabilitative training, and the treatment group ($n=45$) received acupuncture at thirteen ghost acupoints plus routine rehabilitative training. The Beijing Gesell developmental (Gesell) scale and autism behavior checklist (ABC) were used to assess the intellectual, language and behavior development before and 3 months after the treatment.

Results: After the treatment, the total effective rate in the treatment group was 82.2%, versus 55.6% in the control group, showing a statistical significance ($P<0.05$). As for the scores of social, emotional and language in Gesell scale, there were significant intra-group differences in the treatment group (all $P<0.05$), and all the five subscales in the Gesell scale in the treatment group were significantly better than those in the control group (all $P<0.05$). As for the scores of ABC, there were significant intra-group differences in the treatment group ($P<0.05$), and the scores in the treatment group were significantly better than those in the control group (all $P<0.05$).

Conclusion: Rehabilitation training plus acupuncture at thirteen ghost acupoints can significantly improve the intellectual, language and abnormal behavior in autism spectrum disorder children.

Keywords: Acupuncture Therapy; Autistic Disorder; Autism Spectrum Disorder; Thirteen Ghost Acupoints; Rehabilitation; Children, Preschool

【摘要】目的: 观察针刺十三鬼穴治疗儿童孤独症谱系障碍的临床疗效。**方法:** 将纳入研究的90例2~6岁的孤独症谱系障碍患儿采用随机数字表法随机分为2组, 对照组(45例)采用常规康复治疗方法, 治疗组(45例)在常规康复治疗基础上加用针刺十三鬼穴治疗。分别于治疗前和疗程完成休息3个月后运用北京盖什尔 (Gesell) 量表、孤独症行为检查表(ABC)评定患儿智力、语言及行为的变化。**结果:** 治疗后, 治疗组总有效率82.2%, 明显高于对照组的55.6% ($P<0.05$)。治疗后, Gesell量表中, 治疗组社会适应、个人社交和语言3个能区的治疗前后差异有统计学意义(均 $P<0.05$)。治疗后, 治疗组Gesell量表五个能区的评分均优于对照组(均 $P<0.05$)。治疗组治疗前后ABC评分有统计学差异($P<0.05$); 治疗后, 治疗组ABC评分低于对照组, 组间差异具有统计学意义($P<0.05$)。**结论:** 康复训练加十三鬼穴针刺能有效地改善孤独症谱系障碍患儿智力、语言及行为异常。

【关键词】 针刺疗法; 孤独症; 孤独症谱系障碍; 十三鬼穴; 康复; 儿童, 学龄前

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Children autism spectrum disorder (ASD) is a psychological development disorder characterized by deficits in social communication and social interaction, and restricted, repetitive patterns of behavior, interests or activities^[1]. It usually affects children in their 1-3

years old with special symptoms, and has been the main risk factor for children's mental disability with an ever increasing incidence in recent years. Major treatments for ASD include structured teaching, speech and language therapy, music therapy and applied behavior analysis (ABA)^[2]. Some ASD patients may get improvement in their behavior, social communication and language ability, while most patients failed to get a satisfactory therapeutic effect. Recently, a lot of

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researches have been conducted to treat ASD with acupuncture. Thirteen ghost acupoints, a group of thirteen acupoints including Shuigou (GV 26), Fengfu (GV 16), Chengjiang (CV 24), Jiache (ST 6), Shaoshang (LU 11), Daling (PC 7), Yinbai (SP 1), Haiquan (EX-HN 11), Laogong (PC 8), Shenmai (BL 62), Shangxing (GV 23), Huiyin (CV 1) and Quchi (LI 11), were raised by Sun Si-miao in Tang Dynasty for treating *Dian Kuang* (mental disorders) based on his clinical experience. From 2016, we have treated 90 cases of ASD with thirteen ghost acupoints acupuncture and compared it with rehabilitation training. The results are now summarized as follows.

1 Materials and Methods

1.1 Diagnosis criteria

They were based on the *Diagnostic and Statistical Manual of Mental Disorders-V* (DSM-V) by American Psychiatric Association (APA) in 2013^[3].

Persistent defect in social communication and social interaction across multiple contexts, as manifested by the following aspects, currently or before: defect in social-emotional reciprocity; defect in nonverbal communicative behaviors used for social interaction; defect in developing, maintaining, and understanding relationships.

Restricted, repetitive patterns of behavior, interests, or activities: stereotyped or repetitive motor movements, use of objects, or speech; insistence on sameness, inflexible adherence to routines, or ritualized patterns or verbal nonverbal behavior; highly restricted, fixed interests that are abnormal in intensity or focus; hyper- or hypo-reactivity to sensory input or unusual interests in sensory aspects of the environment.

Symptoms must present in the early development period; symptoms cause significant impairment in social, occupational, or other important areas of current functioning; these disturbances are not better explained by intellectual disability or global development delay.

1.2 Inclusion criteria

Conform to the diagnosis criteria above; aged between 2-6 years; the parents and children were willing to sign the informed consent and stick to a 3-month treatment.

1.3 Exclusion criteria

Those who did not meet the above diagnostic criteria; aged ≥ 6 years; having childhood schizophrenia, optic atrophy or nerve deafness; failed to complete the course of treatment because of resisting acupuncture; having frequent seizures of epilepsy.

1.4 Dropout criteria

With an intermission above 7 d during treatment period; violation of clinical observation protocol; those who didn't receive the treatment and evaluation methods or failed to finish the therapeutic effect and

safety evaluation due to lost of major items; poor compliance; intermission of treatment due to complications or serious adverse event.

1.5 Statistical methods

The data processing was done using the SPSS 22.0 version software. The unranked enumeration data comparison was conducted by the Chi-square test. The mean \pm standard deviation ($\bar{x} \pm s$) was used to describe measurement data of normal distribution, and the independent sample *t*-test was used for between-group comparison, whereas paired sample *t*-test was used for inter-group comparison. The *Ridit* analysis was used for ranked data. A *P*-value of less than 0.05 indicated a statistical significance.

1.6 General data

The total 100 cases in this study were all from the Department of Pediatric Neurology and Rehabilitation, Nanhai Maternity and Children's Hospital Affiliated to Guangzhou University of Chinese Medicine. The 90 cases were randomly allocated into a treatment group and a control group, 45 cases in each group. There were no between-group statistically significant differences in age and gender (all $P > 0.05$), (Table 1).

Table1. Between-group comparison in baseline data

Group	<i>n</i>	Gender (case)		Average age ($\bar{x} \pm s$, year)	
		Male	Female	2-4	5-6
Treatment	45	28	17	3.86 \pm 0.25	5.74 \pm 0.81
Control	45	30	15	3.45 \pm 0.76	5.47 \pm 0.38

2 Treatment Methods

2.1 Treatment group

2.1.1 Rehabilitation training

Rehabilitation therapies included music therapy and structured teaching. Nordoff-Robbins method was adopted for music therapy and was conducted by professional therapist in a specific treatment room. Structured teaching was conducted by the senior practitioners for disabled children. The rehabilitative care was conducted every day with a one-day rest in a week, and 60 times made up a course of treatment.

2.1.2 Acupuncture therapy

Points: Referring to the thirteen ghost acupoints by Sun Si-miao^[4], including Shuigou (GV 26), Fengfu (GV 16), Chengjiang (CV 24), Jiache (ST 6), Shaoshang (LU 11), Daling (PC 7), Yinbai (SP 1), Haiquan (EX-HN 11), Laogong (PC 8), Shenmai (BL 62), Shangxing (GV 23), Huiyin (CV 1) and Quchi (LI 11).

Method: Acupoints were punctured in the following order: Shuigou (GV 26), Shaoshang (LU 11), Yinbai (SP 1), Daling (PC 7), Shenmai (BL 62), Fengfu (GV 16), Jiache (ST 6), Chengjiang (CV 24), Laogong (PC 8), Shangxing (GV 23), Quchi (LI 11), and Haiquan (EX-HN 11) [Huiyin

(CV 1) was excluded for difficulty puncturing]. Disposable filiform needles (0.30 mm in diameter and 25 mm in length) were used for acupuncture. Pricking bloodletting method was performed at Shaoshang (LU 11), Yinbai (SP 1), Fengfu (GV 16) and Haiquan (EX-HN 11) without retaining needles, and the needles at other acupoints were retained for qi arrival. Retained the needle for 15 min for patients under 4 years, and 30 min for patients above 4 years, and reducing manipulation of twirling and rotating was performed. The treatment was done 3 times every week, with a 20-day interval after 10 times. Thirty treatments constituted a course of treatment. The patients were treated for three courses.

3 Results Observation

3.1 Observation items

3.1.1 Beijing Gesell developmental (Gesell) scale

Gesell scale was used for evaluating patients' development quotient (DQ) and involved 5 subscales: social, emotional, language, gross motor and fine motor. A DQ score of ≤ 75 points in a single subscale indicated maldevelopment; a DQ score ≥ 76 points but < 85 points indicated a borderline state; and a DQ score ≥ 85 points but ≤ 110 points indicated a normal state^[5].

3.1.2 Autism behavior checklist (ABC)

ABC scale was used for evaluating patients' behavior development and involved 5 subscales: sensory, relating, body and object use, language and social and self-help. An ABC score ≥ 31 points but < 62 points indicated a

suspicion of ASD; and a DQ score ≥ 62 points can be diagnosed with ASD^[6].

3.2 Evaluation criteria^[7]

Marked effect: The social DQ increased by 15 points or the ABC scale decreased by 10 points.

Improvement: The social DQ increased by 10 points when compared with that before treatment or the ABC scale decreased by 5-10 points.

Failure: The social DQ increased by < 10 points and the ABC scale decreased by < 5 points.

3.3 Results

3.3.1 Comparison of clinical efficacy

The total effective rate was 82.2% in the treatment group, versus 55.6% in the control group. The *Ridit* analysis indicated a better result in the treatment group than that in the control group ($P < 0.05$), (Table 2).

3.3.2 Comparison of Gesell scale score

After treatment, there were intra-group statistical significances in comparing DQ scores of social, emotional and language subscales (all $P < 0.05$) in the treatment group. There were no intra-group statistical significances in comparing gross motor and fine motor of DQ (all $P < 0.05$). There was an intra-group statistical significance in comparing DQ score of social subscale ($P < 0.05$) in the control group, while there were no intra-group statistical significances in comparing the other four subscales (all $P > 0.05$). After treatment, there were between-group statistical significances in comparing DQ scores of five subscales (all $P < 0.05$), indicating a better rehabilitation result in the treatment group than in the control group (Table 3).

Table 2. Between-group comparison in clinical efficacy (case)

Group	<i>n</i>	Marked effect	Improvement	Failure	Total effective rate (%)
Treatment	45	5	32	8	82.2 ¹⁾
Control	45	4	21	20	55.6

Note: Inter-group comparison, 1) $P < 0.05$

Table 3. Comparison of Gesell scale scores ($\bar{X} \pm s$, score)

Group	<i>n</i>	Time	Social DQ	Emotional DQ	Language DQ	Gross motor DQ	Fine motor DQ
Treatment	45	Before treatment	34.24 \pm 13.44	32.66 \pm 14.43	37.89 \pm 13.56	43.14 \pm 13.34	42.33 \pm 16.13
		After treatment	50.14 \pm 14.69 ¹⁾²⁾	49.53 \pm 16.11 ¹⁾²⁾	52.44 \pm 19.63 ¹⁾²⁾	48.43 \pm 16.38 ²⁾	46.28 \pm 14.54 ²⁾
Control	45	Before treatment	35.13 \pm 13.45	33.53 \pm 13.29	33.45 \pm 14.01	35.43 \pm 15.74	37.45 \pm 13.67
		After treatment	41.66 \pm 11.32 ¹⁾	37.35 \pm 14.53	37.13 \pm 15.12	36.46 \pm 12.78	39.22 \pm 12.19

Note: Intra-group comparison, 1) $P < 0.05$; inter-group comparison, 2) $P < 0.05$

3.3.3 Comparison of ABC scale score

There was no between-group statistical significance in comparing ABC score before treatment ($P > 0.05$). After treatment, there was intra-group statistical significance in comparing ABC score in the treatment

group ($P < 0.05$), while no intra-group statistical significance in the control group ($P > 0.05$). The ABC score in the treatment group was lower than that in the control group, with a statistical significance ($P < 0.05$), (Table 4).

Table 4. Comparison of ABC score ($\bar{x} \pm s$, point)

Group	n	Before treatment	After treatment
Treatment	45	71.78±8.24	59.35±5.12 ¹⁾²⁾
Control	45	72.77±7.66	69.86±6.45

Note: Intra-group comparison, 1) $P < 0.05$; inter-group comparison, 2) $P < 0.05$

4 Discussion

There were no records of autism spectrum disorder or autism in traditional Chinese medicine (TCM) classics, whereas the descriptions of benighted, crazy, no wisdom, retardation in speech, five retardations, and congenital deficiency in TCM theory^[8] are in accordance with the symptoms of retardation, deficit in using language and absurd actions in autism children, indicating the long history of observing autism in TCM. TCM theory holds that autism is caused by depression of liver and qi ascending failure, obstruction of heart orifices and malnutrition of spirit, and congenital deficiency in kidney essence. The location of this disease is the brain and it's also closely linked with heart, liver and kidney^[9]. TCM holds that depression of liver gives rise to the symptoms of the fluctuation of mood, impatience and deficit in eye movement in ASD children^[10], and their absurd activities belong to consciousness disorder and are linked with functions of heart, kidney, liver and spleen^[11].

Thirteen ghost acupoints were first put forward by Sun Si-miao in Tang Dynasty in his *Bei Ji Qian Jin Yao Fang (Essential Prescriptions Worth a Thousand Gold for Emergencies)* for treating *Dian Kuang* (mental disorders) based on his clinical experience. Ancient people held that psychiatric disorders are caused by ghost and other ghost factors, therefore, acupoints which can treat those diseases are named ghost acupoints^[12]. There are several versions of thirteen ghost acupoints, Sun Si-miao's version has been the most popular one in history, consisting of Shuigou (GV 26), Fengfu (GV 16), Chengjiang (CV 24), Jiache (ST 6), Shaoshang (LU 11), Daling (PC 7), Yinbai (SP 1), Haiquan (EX-HN 11), Laogong (PC 8), Shenmai (BL 62), Shangxing (GV 23), Huiyin (CV 1) and Quchi (LI 11). The Governor Vessel is linked with brain. Governor and Conception Vessels are the sea of yang and yin meridians separately. They are joined at Yinjiao (GV 28) and circulate incessantly to maintain the balance of yin and yang qi in human body. Therefore, the excess or deficiency of Governor and Conception Vessels can usually result in mental disorders^[13], and acupoints of the Governor and Conception Vessels are usually used for mental disorders. In thirteen ghost acupoints, Shaoshang (LU 11) and Yinbai (SP 1) are the Jing-Well points in the Five Shu-transmitting points, while Shuigou (GV 26),

Chengjiang (CV 24), Huiyin (CV 1) and Yinjiao (GV 28) are all located at the start of a meridian which has a similar function as the Jing-Well point^[14]. Thirteen ghost acupoints have the function of dredging meridians, balancing yin and yang, regulating Zang-fu organs and opening the orifices^[15]. Although thirteen ghost acupoints and their related acupuncture methods were set for the treatment of psychiatric disorder, especially insanity in ancient times, many modern researches have reported its effectiveness in treating autism, schizophrenia, insomnia, anxiety, depression, hyperactivity, transient tics disorder or even hyperplasia of mammary gland^[16].

In this study, we treated 90 children of ASD with acupuncture at thirteen ghost acupoints plus routine rehabilitation training, and the results showed a better effect in the treatment group than that in the control group, indicating that the combination of these two methods can improve the rehabilitation effect in ASD children substantially. After treatment, there were intra-group statistical significances in comparing DQ scores of social, emotional and language subscales in the treatment group, while the gross and fine motor subscales showed no substantial improvements. Although ASD children may suffer from motor development retardation in early stage, most of them have the capability of standing and walking alone after diagnosis of autism. Adding thirteen ghost acupoints acupuncture can improve social, communication and language ability in ASD children and produce a good therapeutic effect for the core symptoms of ASD children. After treatment, there were intra-group statistical significances in comparing social subscale of DQ scores, indicating that routine rehabilitation method can also improve intelligence in ASD children, while there is a better effect in the treatment group than in the control group; also, there was intra-group statistical significance in comparing ABC score in the treatment group after treatment, and the ABC score in the treatment group was lower than that in the control group, indicating that adding acupuncture at thirteen ghost acupoints can improve absurd activity in ASD children.

Above all, thirteen ghost acupoints acupuncture has the advantage of simplification and practicability. When combined with routine rehabilitation training, such method has a better effect in improving symptoms in ASD children than rehabilitation training alone, worth popularization. Whereas, such method has a limited effect for the movement functions in ASD children, which indicates that other rehabilitation trainings for motor functions should be combined in such case. Moreover, the long-term effect of this method remains unclear, requiring further investigation.

Conflict of Interest

The author declared that there was no potential conflict of interest in this article.

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Statement of Informed Consent

Informed consent was obtained from the guardians of the recruited children in this study.

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