

Summary and Current Analysis of Traditional Chinese Medicine Treatments for Autism Spectrum Disorders

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Abstract: *The pathogenesis of autism spectrum disorders (ASD) is unclear, and rehabilitation is currently the main treatment. This does have some efficacy in improving the cognition, communication and expression of children with ASD, but it tends to be more of a mechanical learning outcome, and the side effects of Western medicine treatment are obvious. In this paper, we make a systematic elaboration on the treatment of ASD with Chinese medicine, explaining its specific operation method and mechanism of action to provide clinical reference, but the current application and promotion of Chinese medicine for ASD is less than expected.*

Keywords: Autism spectrum disorder, Chinese medicine treatment, Current situation analysis.

1. Introduction

DSM-5 Definition Autism Spectrum Disorder (ASD) is an early-onset neurodevelopmental disorder characterized by abnormalities in social communication and interactions, repetitive and stereotyped behaviours, and a narrow range of interests[1]. Most of the children with ASD have inappropriate interaction behaviours, are unable to integrate into group activities, and even have difficulties in taking care of themselves, which brings serious economic burden and mental pressure to families and society. The latest research shows that the prevalence of ASD in developed countries is as high as 1.5 per cent [2]. In China, the prevalence of ASD in children aged 6-12 is 0.7% [3]. The prevalence of ASD among 6-12 year olds in China is 0.7%. At present, the core symptoms of children with ASD are mainly treated with nutritive neurological drugs, the effectiveness and safety of which are highly controversial and have large side effects; in recent years, rehabilitation therapy, as an emerging treatment modality, has been found to have certain efficacy, such as language training, behavioural training and so on, which can indeed improve the children's cognition, communication, and expression to a certain degree, but it is often the result of mechanical learning, not the result of the children's self-consciousness. However, it is often the result of mechanical learning, not the independent expression of the child's self-consciousness and thinking; where as Chinese medicine is safer and more effective in treating ASD, and may be more easily accepted and recognised by parents. Yan's Treatise on Paediatric Formulas: "When the heart's qi is insufficient, the child is unable to speak at the age of five or six years", suggesting that there may have been a study of ASD in ancient China [4]. This suggests that there may have been relevant records and research on ASD in ancient China, such as Chen Shiduo's proposed method of opening up depression and expelling phlegm and strengthening the stomach to promote qi to treat similar manifestations of autism, including Wash the Heart Soup and Turning Dull Dan, etc; and Yan Xingzhong's proposal of treating both the heart and kidney together by adding Calamus Pill on top of tonifying the kidneys. In modern times, Chinese medical

treatments for ASD mainly include traditional Chinese medicine (TCM) or proprietary Chinese medicine (pCm), acupuncture, acupoint injection, and paediatric acupuncture.

2. Summary of Chinese Medicine Treatment for ASD

2.1 Chinese Medicine or Proprietary

Chinese medicine For the exploration of ASD, it is now mostly believed that its disease is located in the brain, and is related to the heart, liver, spleen, kidney and other organs [5]-[14]. It is now believed that ASD is located in the brain and is related to the heart, liver, spleen and kidney. Ma Bingxiang et al[15]found that ASD is most commonly associated with deficiency of the heart and spleen and fire in the heart and liver. Deficiency of the heart and spleen [16] Children with ASD tend to be inattentive, with dark eyes, indifferent expressions, deafness, aimless movements, fatigue, withdrawn behaviour, and repetitive movements. The tongue is pale and fat, the moss is thin, the pulse is weak, and the fingerprints are pale. Most of the patients are treated with Rejuvenating Spleen Soup combined with Nourishing Heart Soup with additional subtractions [17] or it can be treated by adding flavour to Qishou Wake-up Spirit Tang with the following medicines: Acorus calamus, Polygala, Poria, Jujubae, Uljin, Paeonia lactiflora, Rhodiola rosea, and Cynanchum officinale. One dose per day, the decoction is taken internally, according to the symptoms of the child with the addition or subtraction, 7 payments for a course of treatment, served for a month, each course of treatment can be rested for 3 days. Calamus opens the orifices and awakens the mind, Yuan Zhi calms the mind and opens the orifices, these two herbs open the orifices and open the mind; Por Shen strengthens the spleen and calms the mind, sour jujube kernel nourishes the mind, benefits the liver and calms the mind, these two herbs calms the mind and calms the mind, these two herbs calm the mind and calms the mind. The whole formula regulates the five organs, strengthens the spleen and nourishes the liver, resolves phlegm and opens the orifices, and benefits the intellect and tranquillises the mind, which together can

awaken the spirit and relieve depression, and open and close the orifices. Modern research has proved that calamus and Yuan Zhi can treat central nervous system diseases and improve cognition, and children with ASD are related to the destruction of neural circuits and damage to the central nervous system, so the administration of calamus can improve and repair the damaged central nervous system of the child, thus improving the cognitive level of the child. Or it can be given Chinese patent medicine Qishou Wakes Shen Granules and Smart Puzzle Capsules. Qishou Wake Up Shen Granules is composed of Yuanzhi, Acorus calamus, Poria, etc, which has an excitatory effect on the central nervous system and improves the symptoms of withdrawn behaviour, indifferent expression, laxity, and deafness of children with ASD; Smart Puzzle Capsules is composed of ginseng, Poria, and Shouwu, etc, which improves the damaged central nervous system, thus improves cognitive level of the children with ASD and enhances the children's ability to learn. And the evidence of heart and liver fire exuberance [18] Children with ASD often have averted eyes, wandering, self-movement, hyperactivity, running and jumping, exuberance, narrow interests, stereotyped movements, impatience and irritability, sometimes constipation, with red tongue edges, thin yellow moss, stringy pulse, and purplish fingerprints. Most of the patients were treated with Enlightenment and Tranquillity of Mind Tang Plus Flavour[19]the medicines used are as follows: Yuan Zhi, Acorus calamus, Calcined Magnetite, Raw Dragon's Tooth, Lian Zi Xin, Rhizoma Coptidis, Paeoniae Alba, Acanthopanax Pi, Fried Yam, Ophiopogonis, Scorched Glycyrrhiza Uralensis. One dose per day, decoction juice for internal use, can be based on the child's symptoms with the evidence to add or subtract, 7 payments for a course of treatment, served for a month, each course of treatment can be rested for 3 days between. Calamus resuscitation, dampness and stomach, intelligence, polygata phlegm-removing resuscitation, two drugs for the Jun medicine resuscitation; Magnet, dragon teeth to soothe the mind, ping liver Qian Yang, Huanglian Qingheat dry dampness, lotus heart purging heart fire, this four drugs for the minister medicine purging heart and liver fire; White paeony nourishing blood to collect Yin, soft liver pain relief, calm liver Yang, alxanthia skin to relieve depression, promoting blood circulation, fried yam nourishing qi and Yin, tonifying spleen lung and kidney, ophiopogon nourishing Yin and moistening dryness, Shengjin clearing lung, moistening bowel. These four herbs are used as adjuvants to regulate the functions of the heart, liver, lung, spleen, kidney and the five organs; liquorice regulates all herbs. The whole formula of the heart and liver two organs with the same adjustment, diarrhoea in the complement, taking into account the protection of yin fluid. Modern research has also shown that magnets have the effect of calming the mind, in addition, magnets are rich in iron and calcium and other trace elements, giving magnets can relieve the symptoms of irritability and impulsive behaviour in children with ASD, and it is believed that children with ASD are associated with micronutrient deficiencies, and the administration of magnets such as Dragon's Tooth can replenish micronutrients to improve the children's core symptoms and co-morbidities. Zhang Ningbo et al [20]. found that Yuanzhi and Acorus calamus can communicate with the heart and kidney, and can improve emotional control, sleep, and gastrointestinal symptoms in children with ASD. Or it can be given Chinese patent medicine Qishuanshen granules,

Jingshuaikang capsule and so on. Qishuanshen Granules is composed of magnetite, dragon bone, calcined oyster, etc, which has inhibitory effect on the central nervous system, and can improve the symptoms of children with ASD, such as wandering, self-movement, hyperactivity and restlessness, etc. Jingshuaikang Capsules is composed of tianma, white peony, buffalo horn, etc, which can calm the liver yang, calm the spirit and fix the will, and thus improve the symptoms of hyperactivity and restlessness of ASD, such as children suffering from liver-depression and wind-dynamics, and children suffering from liver depression and fire, which make it difficult for the impulses to be self-controllable.

In addition to the idea of medication based on traditional evidence-based treatment of ASD, Yaxiong Guo [21] Yang Jiangwei et al[22] proposed the idea of medication for treating ASD based on the theory of soul and prana in Chinese medicine, pointing out that children with ASD have many prana disturbances and are unable to sense and collect information correctly.

The soul is disturbed and unable to integrate information correctly and form correct cognition, thus unable to carry out normal expression, communication, exchange, etc. The treatment is based on the principle of tranquillising the soul and settling the spirit, which can be given to Chai Hu to help the soul, Angelica sinensis and Paeonia lactiflora to shed the spirit, Schisandra chinensis to lower the spirit, ginseng and Maidenhair to dissolve the spirit, ginseng to shed the spirit, and the heavy sedative can be added to calm the spirit, so as to make the soul tranquil and the spirit settled. When the soul is at peace, the child with ASD can integrate information correctly, thus improving the child's cognition, thinking and expression, and in addition, it can alleviate the child's growth retardation, emotional abnormality, and visual misalignment and other problems;

Pradhan can correctly sense the collection of information in children with ASD, which is the basis for the formation of correct cognition, in addition to improving the symptoms of excessive sweating, constipation, and weakness of the child.

2.2 Acupuncture and Moxibustion

Mostly head acupuncture is used. "The head is the meeting of all yangs", therefore, head acupuncture therapy is widely used in the prevention and treatment of disease [23] Therefore, head-acupuncture therapy is widely used in the prevention and treatment of diseases. Based on the theory of "Jin three needles" and "Jiao's head acupuncture", Baihui, four divine needles, Zhisinqin, speech one area, speech two area, speech three area are the main acupuncture points, and the acupuncture points can be adjusted according to the symptoms of the child, the operation method: using the flat puncture method, puncture 1.5 inches along the side of the skin. According to the child's specific type of evidence to twist tonic or diarrhoeal method, strong stimulation, stay in the needle time of 45-60 minutes, 6 days for a course of treatment, the end of the course can be rested for 1 day, adhere to the acupuncture for 10-15 courses of treatment.

2.2.1 Speech and language I

The main treatment for motor aphasia and dysarthria, most of the children with ASD can pronounce words, but they have difficulty in speaking, or even are unwilling to open their mouths to communicate, and the amount of words is scarce. Acupuncture can stimulate the speech dominance of the left hemisphere of the brain, and promote the improvement of articulation and speech function of children with ASD [24].

2.2.2 Speech and language II

Naming aphasia is the main treatment for children with ASD who can pronounce and describe simple nouns, but have insufficient naming ability, insufficient or lost ability to call objects and people by their names, difficulty in finding words for verbal expression, and lack of substantive words. Naming aphasia in children can be improved by acupuncture in the second area of speech [25].

2.2.3 Speech and language III

The main treatment for sensory aphasia, children with ASD usually have normal hearing, but have serious difficulties in understanding the spoken language, often answering the wrong questions, have imitation speech, self-talk, but difficult to understand the dialogue and thus difficult to carry out normal communication. By stimulating the three areas of speech, it can improve the children's ability to understand, and thus improve the communication situation [26].

3. Acupuncture Point Injection

Select sodium cytophosphate choline injection and cerebroside carnosine injection alternating with foot Sanli, Sanyinjiao, Neiguan, Fenglong, hanging bell points, each time both sides of one point. Acupuncture point injection can not only play the role of drug nutrition of brain nerves, but also through a long period of acupoint stimulation more effectively play the role of meridian running qi and blood, contact with the five viscera and six bowels, and transmission of stimulation information to the brain.

3.1 Cytarabine Sodium Injection

It can enhance the function of the brainstem related to consciousness, and can promote the repair of brain tissue [27]. To improve the brain circulation of children with ASD, cytarabine sodium injection can be injected at acupoints to promote the recovery of brain function of children with ASD. Each time each acupoint is injected 1ml, 1 time/day, 2 consecutive months as a course of treatment [28].

3.2 Brain Glycoside Myosin Injection

It can promote nerve repair and regeneration [29]. It has a nutritive effect on the cerebral nerves of children with ASD, and promotes the repair of brain and nerve tissue function. Inject 1ml into each acupoint each time, 1 time/day, 2 consecutive months as 1 course of treatment [30].

4. Paediatric Tuina

The hand acupoints and upper and lower limbs meridians, head acupoints, supplemented by abdominal acupoints,

paediatric chiropractic. Method of operation: starch or sesame oil as a medium, in the child's upper limbs or other corresponding parts of the operation techniques, operating frequency of 100-120 / min, each 45-60 minutes, 1 day / times, 90 days for a course of treatment. The generation of brain is influenced by the spleen and stomach's later transportation, fully absorbing the nutrients in the small intestine and reaching the whole body through the meridians, so that the brain marrow can be nourished. There is a certain correlation between brain disease and gastrointestinal disease [31]. Brain disease and gastrointestinal disease have a certain correlation. The brain is connected to the intestines, and paediatric massage can also improve the core symptoms and co-morbidities of children with ASD by regulating the function of the gastrointestinal tract. Zhang et al [32]. found that stimulation of the corresponding acupoints can activate brain function and nerve reflexes, and paediatric Tui Na can improve brain function and treat co-morbidities and tactile sensitivity in children with ASD through direct action on the head or indirect stimulation.

5. Analysis of the Current Status of Chinese Medicine Treatment

Chinese medicine, as a traditional medicine in China, has been increasingly recognised by many parents in recent years, and the advantages of Chinese medicine in treating ASD are:

(1) Flexible prescription, add and subtract according to the symptoms, have a clear relief effect on children with ASD. ASD symptoms are complicated, complex pathogenesis, part of the symptoms can be given priority to improve, ASD is mostly a co-morbid child, clinical often accompanied by hyperactivity disorder, tics, sleep disorders, eating disorders, constipation, etc., and sometimes a part of the symptoms of the improvement of the disease will be accelerate the recovery of the disease.

(2) Relatively safe and easy to accept. Compared with other western medicines, Chinese medicines have less toxic side effects, and few children have side effects and uncomfortable symptoms, so they can adhere to long-term medication. Due to the long course of treatment, and ASD is mostly for children, stevia can be added to change the taste of Chinese medicine, and the dosage form can be made into pills, etc., which is convenient to take and easy to carry.

(3) Low cost and reduced financial burden: ASD is difficult to cure and generally requires year-round treatment and rehabilitation, which is costly and unaffordable for many families, and traditional Chinese medicine is more economical and effective.

(4) Adjustment of constitution, tailor-made. Each child with ASD has a different performance and his/her constitution is also different, TCM starts from each child's constitution to adjust his/her constitution and enhance his/her resistance to disease.

(5) Convenient management and long-term monitoring. Although there are designated ASD treatment institutions in some areas of China, the treatment cycle is long, and requires long-term fixed personnel to accompany the staff and

economic costs and other factors that make it difficult for many children to persist in the long term, traditional Chinese medicine can be combined with family rehabilitation and other treatments, which facilitates the management and long-term monitoring of changes in the condition of the child.

Although TCM treatment of ASD can improve its core symptoms and co-morbidities to a certain extent, it still has many shortcomings:

(1) the various schools of thought, the lack of systematic overall research, there is no unified standard of treatment, the existing research from the viscera treatment, and due to the inadequacy of the traditional visceral diagnosis and treatment, some scholars jumped out of the visceral theory, from the soul of the theory of the beginning of the study of Chinese medicine treatment of ASD has a certain degree of innovativeness of the idea, but due to the inheritance and development of the soul theory due to the existence of historical reasons there are certain limitations, there is still a need for further improvement and inheritance.

(2) It is difficult to accurately and uniformly grasp the dosage of Chinese herbs and the amount of acupuncture stimulation. The dosage/stimulation amount of Chinese herbal medicines for children needs to be grasped with discretion, and the dosage/stimulation amount should be from light to heavy, and should not be repeated with large dosage of medicines or heavy manoeuvres, especially toxic Chinese medicines, and the adverse effects should be monitored with care.

(3) Lack of support of large sample size, TCM treatment for ASD is mostly used in a small area and within individual regions, and lacks the support of large sample size and multi-centre data.

(4) Lack of support from evidence-based medicine; current treatments for children with ASD are still in the ongoing research phase and lack evidence support from advanced evidence-based medicine.

(5) There is a lack of research on the screening of effective/specialty Chinese medicines, especially on the mechanism of action and pharmacokinetics of the active ingredients, which further limits the promotion of Chinese medicine in the clinic.

(6) It is difficult to control the quality of Chinese medicines. It may be related to the lack of uniform standards and effective regulation, etc., while the poor quality of Chinese medicines has a direct impact on the efficacy of Chinese medicine.

(7) There is a lack of uniform and recognised standards for TCM efficacy evaluation. Issues such as whether it is necessary to include and how to select objective indicators, including quantitative evidence such as various types of laboratory tests, and how to quantify symptom improvement by design need to be resolved urgently. Only by establishing standards for the efficacy of Chinese medicine can it be conducive to the recognition and widespread promotion of Chinese medicine.

(8) Shortage of talents in Chinese medicine services,

especially those involved in the psycho-neurological field. Due to the long training cycle of Chinese medicine talents, the research and promotion of Chinese medicine in the field of treating ASD and other related diseases have been greatly restricted.

Based on the above analysis, Chinese medicine treatment for ASD can also be combined with behavioural psychotherapy such as suggestive demystification and behavioural modification, and Western medicine treatment can be used with some assistance where necessary, and should not be blindly biased.

6. Summary

ASD is a lifelong neurodevelopmental disorder. Although there is a lack of drugs to treat its core symptoms, Chinese medicine treatment can improve the co-morbidities of children with ASD and thus alleviate their core symptoms and reduce the pain of children and parents. However, due to the limitations of Chinese medicine research and clinical promotion, it still needs the cooperation and promotion of doctors, parents and children.

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