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Research Progress on Acupuncture Treatment for Children with Autism Spectrum Disorder

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Abstract: ***Autism spectrum disorder (ASD), commonly referred to as autism, has a high prevalence rate. This rate has been increasing year by year. The pathogenesis of ASD involves multiple factors. Overall, however, a clear understanding remains lacking. Studies indicate that acupuncture, as a therapy within traditional Chinese medicine external treatments, shows significant effects on core symptoms of ASD. Its safety and efficacy have been widely recognized. Although acupuncture is not a primary treatment for autism, it demonstrates certain potential in alleviating specific symptoms and improving quality of life for patients. Acupuncture plays an important role currently and will continue to do so in the future.***

Keywords: Autism spectrum disorder, Autism, Acupuncture**.**

1. Introduction

ASD is a neurodevelopmental disorder that begins in infancy or early childhood. Its core clinical manifestations include impaired social interaction and communication, extremely restricted interests, and repetitive stereotyped behaviors. This condition poses serious challenges to the psychological and physical health of affected children. It also places heavy pressure and burden on family structures and social support systems [1].

ASD is currently recognized to be associated with mechanisms such as genetics, environment, immunity, and gut microbiota. Research on underlying mechanisms has identified neuroinflammation and synaptic dysfunction as potential therapeutic targets [2, 3]. However, due to a lack of precise understanding, effective treatments for these core symptoms still need improvement. Acupuncture, as a treatment for autism, offers diverse approaches and shows significant efficacy. It is favored in clinical practice, particularly because it can address comorbid conditions. Multiple studies have indicated that acupuncture is safe and effective for treating autism [4].

In traditional Chinese medicine, childhood autism falls into the category of "five delays and five flaccidities." Its etiology includes both congenital and acquired factors, namely insufficient endowment and improper nurturing. The disease is located in the brain. The spinal cord and the brain are interconnected. Marrow is transformed from essence. Only when acquired essence is abundant can the brain marrow be fully nourished [5]. Acupuncture is a distinctive therapy in traditional Chinese medicine. By needling relevant acupoints, it stimulates blood circulation beneath the acupoints. This improves qi and blood and regulates the qi of the viscera [6]. The following discusses the research progress of acupuncture therapy in autism.

2. Background

In 1943, Dr. Leo Kanner, a pioneer in child psychiatry at Johns Hopkins Hospital in the United States, published a groundbreaking report titled "Autistic Disturbances of Affective Contact." This milestone marked the official start of autism research worldwide. In contrast, autism research in China began relatively late. However, since 1982, when Professor Tao Guotai from the Nanjing Child Mental Health Research Institute conducted in-depth studies on the diagnosis and classification of infantile autism, domestic academic interest has grown steadily. In recent years, increased public awareness and media influence have further accelerated autism research in China, showing strong momentum. As society evolves, autism has drawn widespread attention from all sectors. Its prevalence has risen year by year, indicating that it is no longer a rare disease. Moreover, autism has a substantial impact on families and social development. Although the etiology of autism remains unknown, a general consensus points to an interplay between genetic and environmental factors. Specifically, the combined effect of genetic sequence variations and adverse environmental factors, especially de novo mutations, is considered a key driver of autism onset. In addition, the pathogenesis is closely linked to abnormal connectivity in brain neural networks. This abnormality significantly affects an individual's ability to process and understand social signals.

Acupuncture is an important component of traditional Chinese medicine. In recent years, it has been increasingly applied in treating children with autism. There have been growing reports on clinical practice and research of traditional Chinese medicine therapies for ASD, particularly acupuncture, which is known for its significant efficacy in improving clinical symptoms. However, due to the insufficient level of evidence from clinical studies, acupuncture has not yet been effectively applied and promoted [7]. The authors have summarized recent clinical studies on acupuncture treatment for ASD. This review aims to provide a theoretical basis for this therapy. The goal is to better serve clinical diagnosis and treatment.

3. Research Status

In recent years, traditional Chinese medicine (TCM) has placed great emphasis on the diagnosis and treatment of ASD. TCM therapies, especially non-pharmacological ones such as acupuncture as reported in the literature, have emerged with

significant efficacy [8, 9]. Acupuncture, a time-honored TCM therapy, has gradually gained prominence in the treatment of autism. It has become a focus of research and clinical attention. Although it does not occupy a dominant position in autism treatment, its potential in alleviating symptoms and improving quality of life should not be overlooked.

In-depth Analysis of the Current Status of Acupuncture in Autism Treatment. At present, in China and many other Asian countries, acupuncture is widely used in the treatment of autism through various approaches. These include commonly known methods such as electroacupuncture and manual acupuncture, as well as fire needling, laser acupuncture, scalp acupuncture, and bee venom acupuncture [10]. However, there are many schools of acupuncture. Different practitioners vary greatly in their needling experience and habits. The efficacy underlying this heterogeneity is difficult to ascertain. Although current medical and health conditions have improved significantly, there is still a need to continuously standardize practitioners' needling techniques. Efforts should be made to create a more standardized medical environment and further enhance the safety and efficacy of acupuncture [11]. In clinical research on TCM treatment for ASD, the influence of acupuncture is growing. It has already played an indispensable role. The use of multiple acupuncture methods for treating autism has become increasingly mature [12]. Acupuncture treatment plans should be individualized for patients with autism. Factors such as age, severity of condition, and physical constitution should be taken into account. Various acupuncture techniques, including body acupuncture, scalp acupuncture, and ear acupuncture, are flexibly applied. They are often combined with other TCM methods such as electroacupuncture and moxibustion to achieve optimal therapeutic effects. According to the literature reviewed, five TCM syndrome types of ASD are involved. They are: heart-liver fire hyperactivity type, liver qi stagnation type, phlegm misting the heart type, kidney essence deficiency type (also known as kidney essence insufficiency type), and liver-kidney deficiency type. In terms of acupoint selection based on syndrome differentiation, statistics show that seven acupoints are commonly used as main points across all syndrome types. These are Shenting, Benshen, Sishencong, Shenmen, Yintang, Naokong, and Naohu. Compared with main points, the use of adjunct points is more complex. The adjunct points with higher frequency of use include Taichong, Hegu, Xingjian, Daling, Shaofu, Fenglong, and Taixi [13]. Based on this, it can be inferred that acupuncture treatment for autism may follow certain patterns. Studies have shown that there are indeed general rules and commonalities in acupuncture treatment for ASD at present.

For acupoint selection, documented literature includes ten head acupoints: Benshen, Shenting, Sishencong, Shenmen, Yintang, Naokong, Naohu, Shuigou, Yangbai, and Shuaigu. Among these, the first seven are the common main points selected in all syndrome-differentiation literature. In addition, five other acupoints are included: Erjian, Neiguan, Laogong, Zusanli, and Yongquan. This totals fifteen acupoints. These points have an application frequency of more than half. Furthermore, Sishencong is the universal acupoint across all literature [13]. On the other hand, when analyzing meridian affiliations, it is found that the Gallbladder Meridian of Foot-Shaoyang, Extraordinary Points, and the Governor Vessel are always selected in acupuncture. These general rules play a unique role based on the basic theories of traditional Chinese medicine. The two are closely related.

Acupuncture has significant efficacy, attracting many practitioners to conduct in-depth studies. Different practitioners hold different views on acupuncture therapy. For example, Zhao Ningxia [14], based on theories from the Lingshu · Benshen which states "All acupuncture methods must first be based on the spirit," and from the Lingshu · Guanneng which states "The key to needling is not to forget the spirit," creatively proposed the "spirit-regulating acupuncture" method for treating speech communication disorders in children with ASD based on syndrome differentiation. This was combined with rehabilitation training and special education. After treatment, it was clear that this method achieved satisfactory clinical efficacy, with the treatment group significantly outperforming the control group. Li Wei [15] used quick needling of Back-Shu and Front-Mu points combined with scalp acupuncture. The results showed that this method could calm the mind and spirit, improve abnormal behaviors and emotional changes, restore the function of the heart governing the mind, thereby improving language and daily social interactions in children with autism, and enhancing cognitive levels. A notable advantage of this method was that few obvious adverse reactions were observed. He Jinhua [16] applied the combined method of Huxiang acupuncture with five-meridian compatibility acupuncture on the basis of early comprehensive rehabilitation intervention. The results confirmed that Huxiang five-meridian compatibility treatment could greatly improve language behavior disorders in children with ASD, enrich vocabulary, and enhance communication skills.

4. Trend Prediction

The research results reported in the review by Kong Yidan and Chen Zhelin [17] show that the general public, as well as patients and their families, often lack a correct understanding of autism. Misguided beliefs and misconceptions link autism with terms such as "inferior," "severely disabled," and "violent." In fact, ASD is not what these terms imply. In addition, low social connectedness and issues of patient and family identity can have negative effects on physical and mental health to varying degrees. For this group, professional advice is a crucial source of spiritual support. This is what patients and their families commonly expect.

The critical period for individual identity formation is childhood. Patients with autism realize they are different from others from early on. This indicates that their identity development is influenced during childhood. Besides targeted counseling services, there is a need to improve society's overall understanding of autism. Patients, families, researchers, and therapists should pay special attention to the importance of positive identity for patients. Educators and the media should expand public education on autism and leverage their strengths. For example, they can provide online autism introduction services, offline popular science acupuncture courses, and help improve social communication skills for autistic individuals. More psychological support should also be given. This will benefit education and rehabilitation after

diagnosis, help patients build a positive identity, and to some extent reduce the economic burden on their families.

Shi Jianping and Du Xueyuan [18], based on CiteSpace software analysis, summarized professional hotspots, keywords, and development trends in this field. They drew the following conclusions. First, the overall number of articles is showing a positive growth trend. An increasing number of experts and scholars are paying attention to research developments in this area. In the coming decades, as more people gain awareness of autism and research capabilities continue to improve, related studies are expected to keep growing. Second, more diversified research content will be explored and breakthroughs will be made. For example, acupuncture treatment for language disorders in children with autism has multiple effects. It strengthens language training, emphasizes logical language ability, and assists rehabilitation. As research deepens, various disciplines will become involved, including psychology, medicine, education, and neuroscience. Other more cutting-edge studies will also integrate with this field. This holds promise for mutual exchange and beneficial outcomes. Of course, in-depth research across these interdisciplinary areas requires broader expertise and higher-level talent. Hot topics cannot be explored without the joint efforts of professionals. The contributions of more people will light up the hearts of every autistic patient.

It can be seen that TCM external therapies represented by acupuncture not only improve the core symptoms of autism. More importantly, they significantly regulate other comorbid issues. This is achieved by regulating the functions of various organs and promoting brain development.

5. Summary

Autism is a pervasive developmental disorder. It usually occurs in children before the age of three. Its main clinical features include varying degrees of interpersonal communication impairment, delayed speech development, narrow interests, and stereotyped behaviors. The etiology and pathogenesis of childhood autism spectrum disorder can be attributed to both congenital and acquired factors. Congenital insufficiency or improper nurturing after birth may lead to insufficient brain marrow, loss of mental nourishment, and dysfunction of mental activities. The disease is located in the brain. It is closely related to the heart, liver, spleen, kidney, and other viscera.

At present and in the future, there is great room for development in the field of autism. Western medicine has not yet established a standardized and effective treatment protocol. From the perspective of TCM syndrome differentiation of zang-fu organs, acupuncture, as a distinctive TCM therapy, stimulates acupoints and meridians. It shows significant efficacy in treating core symptoms of ASD and associated problems such as sleep disorders, emotional abnormalities, and feeding difficulties. Acupuncture will become a powerful supportive force in autism treatment.

However, current TCM therapies mostly focus on improving language and cognitive functions. There are few studies on the core symptoms of autism, and most lack long-term efficacy follow-up [19]. According to Hui Jingrui [20], although TCM therapies represented by acupuncture started relatively late in treating childhood autism, their therapeutic outcomes are evident. It can be said that acupuncture has already achieved remarkable results. The authors identified several points. First, compared with rehabilitation training alone, acupuncture can significantly improve core symptoms. For better results, combined acupuncture and rehabilitation training is effective. Second, combining acupuncture with other related TCM techniques can achieve twice the result with half the effort. However, problems still exist. First, there is no unified standard for needling techniques or acupoint selection. When evaluating efficacy in autistic children, there is no assessment system for effective evaluation, evidence verification, or retrospective exploration. Second, some patients and their families do not understand acupuncture and often doubt its subsequent outcomes. When dividing clinical study groups based on personal willingness, such concerns may lead to non-representative samples and experimental bias. Finally, for lifelong disorders, longer observation periods and regular follow-ups may be needed to better evaluate clinical efficacy. In fact, few experts or scholars conduct long-term follow-up visits for autistic children. Consequently, the resulting data may be somewhat biased.

In the future, acupuncture for children with ASD may take this as a breakthrough. Strengthening research in this direction could benefit more autistic children. In summary, research on autism covers multiple aspects, including historical origins, etiological mechanisms, clinical manifestations, scientific progress, and social responses. With deepening research and growing public attention, we have reason to believe that future treatment and research on autism will achieve even greater accomplishments, bringing hope and light to more patients.

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