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Review of New Advances in the Diagnosis and Treatment of ADHD

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Abstract: This review explores the etiology and treatment of attention deficit hyperactivity disorder (ADHD). The onset and therapeutic outcomes of ADHD are closely related to family lifestyle, and parental cooperation plays a critical role in effective management. Although the exact pathogenesis of ADHD remains unclear, integrated approaches involving both medical and familial interventions are essential.

Keywords: Attention deficit hyperactivity disorder; Western medicine; traditional Chinese medicine; psychological intervention

Introduction

Attention deficit hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in childhood. Its main clinical features include inattention, hyperactivity, and impulsivity, which are inconsistent with the child's developmental level. ADHD is typically classified into three subtypes: inattentive type, hyperactive-impulsive type, and combined type. It is often accompanied by learning difficulties, emotional and behavioral problems, although intellectual development is usually normal or near-normal ^{[1][2][3]}.

Compared with treatments a decade ago, ADHD management has expanded beyond traditional Western medical approaches. Novel treatment strategies now include traditional Chinese medicine, acupuncture, non-pharmacological therapies, behavioral interventions,

psychological counseling, and parent training. ADHD treatment is increasingly recognized as a multidisciplinary, multi-domain, and multidimensional process involving healthcare, nursing, family, education, and social systems, working in an integrated and synergistic manner.

1. Pharmacological Treatment in Western Medicine

Western medicine primarily employs central nervous system (CNS) stimulants and non-stimulants in the treatment of ADHD ^[4]. Commonly used stimulants include methylphenidate and amphetamine preparations, with methylphenidate regarded as the first-line medication in clinical practice. Non-stimulant medications include two main categories: selective norepinephrine reuptake inhibitors and $\alpha 2$ -adrenergic receptor agonists.



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2. Traditional Chinese Medicine (TCM) Syndrome Differentiation Therapy

In TCM, treatment for ADHD is based on the principles of “reducing excess and reinforcing deficiency, harmonizing the viscera, balancing yin and yang, and nourishing yin and blood.” In the *Clinical Practice Guidelines of Traditional Chinese Medicine Pediatrics* (2019) and the TCM treatment protocol for childhood ADHD issued by the Department of Medical Administration of the State Administration of Traditional Chinese Medicine in 2011^[5,6], ADHD is classified under the principle of syndrome differentiation. Five major TCM syndromes are commonly identified:

(1)Hyperactivity of heart and liver fire: characterized by hyperactivity and impulsivity, with a tendency to irritability and quick temper.

(2)Disturbance of phlegm-fire: manifested as hyperactivity and impulsivity, with a preference for greasy, fried, and sweet foods.

(3)Deficiency of liver and kidney yin: characterized by inattention, hyperactivity, and impulsivity, often accompanied by developmental delay compared with peers.

(4)Deficiency of both heart and spleen: mainly presenting with inattention, fatigue, reluctance to speak, weakness, shortness of breath, and a thin body habitus.

(5)Spleen deficiency with liver hyperactivity: characterized by inattention, hyperactivity, and impulsivity, with introverted personality traits and a tendency to brood.

Classical Chinese medical texts have also described related conditions. For instance, *Fu Xing Jue* noted that “excessive fire of the heart and ministerial fire with depletion of yin fluid leads to emotional disturbances,” while *Huangdi Neijing* described that obstruction of defensive qi results in sleep disorders. Liver and kidney deficiency results in general fatigue, while deficiency of the heart and liver blood causes mental confusion, described as “as if possessed by spirits.” Based on different syndromes, TCM prescribes corresponding treatments. Commonly used prescriptions include modified Anshen Dingzhiling, modified Huanglian Wendan Decoction, modified Qiju Dihuang Pills, and modified Xiaoyao Powder.

3. TCM-Based Complementary Techniques

Beyond herbal remedies, acupuncture is widely applied in ADHD management and has been recognized by the World Health Organization (WHO) as an effective alternative therapy. Acupuncture regulates the flow of qi and blood, restores organ function, and alleviates symptoms. Commonly used techniques include scalp acupuncture, body acupuncture, and auricular acupressure. Frequently selected acupoints are Sishencong, Shenmen, Hegu, Sanyinjiao, Yanglingquan, Laogong, Taichong, Neiguan, Zusanli, Shenshu, and Ganshu. Treatment is often individualized following the TCM principle of “treating the root in chronic cases and addressing the branch in acute cases, while integrating root and branch therapy.” In practice, TCM is frequently combined with Western medical approaches to optimize clinical outcomes.

4. Multidisciplinary Integrated Treatment: Psychotherapy, Family Education, School-Based Interventions, and Social Support

Beyond pharmacological and TCM interventions, the integration of psychology, education, and social sciences has made ADHD treatment increasingly diversified, resulting in more favorable therapeutic outcomes. Multidisciplinary approaches complement each other, not only alleviating core symptoms such as inattention, hyperactivity, and impulsivity, but also enhancing social functioning and improving overall adaptive capacity.

Recent studies have demonstrated that applying cognitive reappraisal strategies can effectively reduce anxiety in children with ADHD. For instance, a survey conducted among 10,211 primary school students in Kashgar, Xinjiang, showed that cognitive reappraisal interventions alleviated anxiety to a certain extent in children diagnosed with ADHD. Cognitive reappraisal is an early-stage emotional regulation strategy, which alters the interpretation of emotional events to attenuate negative emotional responses.

Evidence suggests that female ADHD patients tend to exhibit higher anxiety levels compared with males and may carry a greater polygenic burden of risk alleles. Thus, incorporating cognitive reappraisal strategies into treatment may yield greater therapeutic benefits for females. In clinical practice, clinicians should pay close attention to comorbid anxiety, focus on emotional

regulation training, and provide psychological counseling to help patients develop healthy strategies for managing negative emotions. Such interventions not only reduce behavioral problems but also facilitate better social adjustment. Children with ADHD often have lower levels of self-awareness, which is influenced by individual, familial, school, and social factors. Since it is challenging for doctors to directly modify broad environmental conditions, therapeutic efforts should focus on empowering children to regulate their own emotions, thereby enhancing resilience against adverse external stimuli and promoting psychological well-being. Studies have shown that the period between ages 9 and 12 is critical for personality formation, as well as for the development of attention and cognition. Due to inattention, children with ADHD, despite having generally normal intelligence, often experience learning difficulties. Their impulsivity makes it difficult for them to follow school norms and social rules, which in turn leads to poor peer interactions, frequent conflicts, and difficulties adapting to school and society. Within the family, these children are also prone to conflicts with elders and resistance to discipline, which increases family tensions. In such close relationships, parents may give negative evaluations of the child, which can adversely affect the child's self-evaluation and ultimately lower their self-awareness. Difficulties in maintaining positive intimate relationships, such as with parents or peers, may further aggravate feelings of inferiority, thereby reinforcing the cycle of low self-evaluation. This creates a vicious cycle. Although the exact etiology of ADHD remains unclear, its onset and treatment outcomes are closely related to family life, and parental cooperation in treatment is of critical importance.

Proper parental guidance and the provision of a supportive environment are of great importance. Even if parents are unable to change their own lifestyle habits or educational methods, actively cooperating with medical treatment, refraining from resistance to physicians' recommendations, and adopting an appropriate and realistic attitude toward the child's condition can still be highly beneficial to the child's rehabilitation.

A retrospective review of an ADHD patient, Xiaoyu (pseudonym), followed by the authors between 2012 and 2023, highlights the critical role of parents

in the treatment process. Xiaoyu, a female, was diagnosed with ADHD in 2008. She was treated with methylphenidate for one year, after which her condition improved and she transitioned to non-pharmacological interventions. In 2009, community hospitals had not yet implemented "parent training classes" or similar programs; treatment mainly relied on routine outpatient follow-up, face-to-face consultations, and telephone communication. Between 2012 and 2023, Xiaoyu went through major life stages, including transferring to a new primary school, advancing from junior high to senior high school, and preparing for the National College Entrance Examination. Throughout these periods of heightened stress, Xiaoyu's parents provided significant psychological support within a close and trusting relationship. They maintained timely communication with physicians regarding Xiaoyu's condition, helped her regulate negative emotions, and guided her in appropriately handling peer relationships at school. With the continuous involvement of both parents and physicians, Xiaoyu has successfully adapted to various challenges and is currently studying at a university in Chongqing, maintaining stable friendships and demonstrating good social adaptability. Nonetheless, her treatment journey was not entirely smooth. For instance, during her second year of senior high school, conflicts with teachers and difficulties in school adjustment led to temporary school aversion. Through psychological counseling and emotional support, Xiaoyu was able to resolve her negative emotions and successfully complete the college entrance examination. The effectiveness of Xiaoyu's psychological interventions can be largely attributed to her complete and profound trust in her parents. This form of psychological support, deeply rooted in parental involvement, is irreplaceable by any other medical treatment.

Children's self-evaluation reflects their internalized value system and perceptions of family, school, and social environments. Self-awareness formed in childhood exerts long-term influence into adulthood. If left unaddressed, low self-esteem and poor self-concept in ADHD children may persist into adult life, adversely affecting mental health and social adaptation.

Studies indicate that at least one-third of ADHD patients present with comorbid developmental or psychiatric disorders, such as bipolar disorder, conduct

disorder, substance use disorder, anxiety disorders, depression, or obsessive-compulsive disorder. According to DSM-5 diagnostic criteria, effective management of comorbidities requires a combination of pharmacotherapy, psychotherapy, and parental training. Psychotherapeutic approaches—including cognitive behavioral therapy (CBT), behavioral modification, and family therapy—play essential roles in reducing symptom severity and preventing further disease progression.

Among non-pharmacological interventions, exercise therapy has shown notable benefits. Children engaging in regular outdoor aerobic activities demonstrate significantly better recovery rates than those with sedentary lifestyles. Moreover, excessive screen time and internet use in ADHD children increase the risk of developing internet addiction. Structured physical exercise not only enhances immune function, neurodevelopment, and motor coordination, but also improves willpower, behavioral regulation, and academic performance. Participation in group-based outdoor games fosters self-confidence, discipline, problem-solving, interpersonal communication, and social adaptability, creating a positive feedback cycle that supports long-term rehabilitation.

In the current context of comprehensive treatment, medical science popularization and education have enabled schools and society to offer greater tolerance and support for children with ADHD. Schools can collaborate with psychological counselors and special education teachers to provide individualized education plans, implement differentiated instruction, help students overcome learning difficulties, and offer support services to assist with emotional regulation and behavioral control. At present, most primary schools adopt small-class teaching, which facilitates better communication between teachers and students and allows teachers to pay closer attention to each child. Some schools also provide social skills training to enhance students' interpersonal abilities and offer art courses to help them discover personal interests, improve overall competence, and build confidence and self-esteem. Consequently, students' self-awareness can be strengthened, leading to more positive self-evaluations. At the societal level, public awareness of ADHD has grown significantly, which has improved early recognition of the disorder. As a result, more

children with ADHD can be identified at an earlier stage, achieving the goal of early detection, early diagnosis, early intervention, and early treatment. Within the framework of life-course management, timely identification of developmental deviations and early intervention may achieve the effect of "treating disease before it occurs." Confidence-building plays a pivotal role in the rehabilitation process. It is essential not only for children with ADHD to develop self-confidence but also for society to foster confidence in their potential. Historical figures such as Leonardo da Vinci, Mozart, and Bill Gates were all thought to have had ADHD, yet with appropriate guidance and by leveraging their strengths, they were able to succeed and achieve remarkable accomplishments. Such confidence not only benefits the physical and mental development of children with ADHD but also alleviates the psychological burden on their families.

Conclusion

The integration of multiple disciplines and fields—including medicine, nursing, family, education, and society—has provided new directions for the rehabilitation and treatment of ADHD. Family-based interventions and the establishment of positive, supportive relationships are of great significance in improving treatment outcomes. Looking forward, with the integration of emerging technologies such as artificial intelligence, executive function assessment, and brain function testing, ADHD treatment is expected to achieve more effective approaches and higher cure rates.

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