

Cause and Intervention in Children with Attention-Deficit/Hyperactivity Disorder

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Abstract

Attention-deficit/hyperactivity disorder (ADHD) usually occurs in childhood and is characterized by neurodevelopmental disorders. It is characterized by age-inappropriate attention deficit, behavioral hyperactivity and emotional impulsivity, and even accompanied by cognitive impairment. The exact cause of the disease is still unclear. It is generally believed that the incidence is the result of the combined action of biological factors, environmental factors and psychological factors. Therefore, the treatment of ADHD children should take into account multiple factors, various stereoscopic and comprehensive interventions. This article reviews the concept, cause, diagnosis and treatment of ADHD.

Keywords: ADHD, cause, diagnosis, intervention

1. Introduction

Attention-deficit/hyperactivity disorder (ADHD) is characterized by attention deficit, hyperactivity and impulsive behavior inconsistent with the development level as the main clinical manifestations (Han et al., 2017). In the United States, the prevalence rate of ADHD is about 3.0% ~ 7.0% (Szabina et al., 2019), and the prevalence rate of ADHD in China is as high as 6.26% (Wang et al., 2017). As a chronic disease, ADHD can last for several years or even affect the whole life. It is easy to cause negative effects on children and adolescents' learning, behavior, emotion and social interaction (Zheng & Liu, 2015). School age is an important intervention period for ADHD, but very few parents will take their children to the child health department in

the early stage of ADHD, because most parents often mistake children with ADHD in the pre-school age for active "normal" children. Until school age, children can attract the attention of teachers and parents when they have significant performance in life, learning and emotions (Xia et al., 2023). Therefore, ADHD, as a common childhood disorder, has become very important for people to understand its basic concept, occurrence, diagnosis and intervention.

According to the *Diagnostic and Statistical Manual of Mental Disorders-V* (DSM-5, APA, 2013), different clinical manifestations of children can be divided into three subtypes: Predominantly Inattentive subtype (ADHD-I), Predominantly Hyperactive/Impulsive subtype (ADHD-HI) and

Combined subtype (ADHD-C). ADHD-I is mainly manifested as difficulty in maintaining attention, easy to be distracted, and doing things without finishing them. ADHD-HI is characterized by excessive activity, unwillingness to wait for turns, and interference with others. ADHD-C is a prominent symptom of attention deficit and hyperactivity impulsivity.

2. Cause

2.1 Anatomical Differences in the Brain and Genetic Factors

Children with ADHD have abnormal brain structure and function. Anatomic magnetic resonance imaging (MRI) studies showed that the total brain volume of ADHD children was reduced by 3% to 5%. Reduced volume in the frontal lobe, basal ganglia and cerebellum is closely related to the severity of ADHD (Yu et al., 2021). In children with ADHD, 5-hydroxytryptamine (5-HT) increased significantly, but dopamine and norepinephrine neurotransmitters were lower than normal levels (Hinshaw & Stephen, 2018). Parents' congenital physical defects, chromosome abnormalities, mental disorders and other related genetic factors will lead to abnormal brain function in children, and then appear hyperactivity and other clinical manifestations (Ma, 2021).

2.2 Social and Psychological Factors

The environment can also have an impact on ADHD. The appearance or aggravation of ADHD symptoms is related to poor family environment, improper parenting style and excessive attachment to a certain extent (Wang et., 2016). After ADHD patients become parents, the children raised by ADHD patients will have more obvious psychological abnormalities and behavioral impulses than those raised by healthy families (Ma, 2021). When teachers guide children with autocratic parenting, parents' excessive demands on children and turn a blind eye to children's success, children's self-efficacy will be significantly depressed, leading to the occurrence of children's ADHD symptoms, showing poor mental outlook and impatient behavior (Ma, 2021).

The exact cause of ADHD is not known. It is generally believed that cause is the result of the joint action of biological factors, environmental factors and psychological factors (Pan et., 2018).

3. Diagnosis

DSM-V and the International Classification of Diseases 11th Edition (ICD-11) are currently used by clinicians as diagnostic scoring criteria. The DSM-V will meet six criteria for attention deficit and hyperactivity/impulsivity (hyperactivity, restlessness, loss of necessary items for daily activities, constant hyperactivity, self-answering, excessive but unfocused speech, difficulty following instructions), lasting for at least six months, reaching levels of maladjustment and inappropriate for normal child development, and excluding other mental disorders for diagnosis.

ICD-11 can be included in this classification only if the core feature is a neurodevelopmental disorder in which the child has significant difficulty in acquiring and performing specific mental, motor, or social tasks. The application of clinical rating scale (such as Conners behavior Scale) (Pan & Xu, 2020) combined with MRI can further make accurate diagnosis. By understanding the mechanism of ADHD brain network and related diagnostic models, MRI can identify brain regions with certain differences between ADHD children and normal children (Xu, 2020).

In the diagnosis of ADHD children, attention should be paid to the differential diagnosis of mental retardation, child autism, child emotional disorders, conduct disorders. For example, when the child has hyperactivity, inattention or emotional impulse, the cause should be observed first to determine whether the child is biologically hyperactive, then the diagnosis, assessment and IQ measurement of ADHD are carried out, and finally whether the child is accompanied by other organic diseases of nervous system (Wang, 2014).

4. Intervention

4.1 Drug Therapy

Drug treatment mainly includes central stimulants, antidepressants and selective norepinephrine reuptake inhibitors. Drug treatment is accompanied by corresponding complications. Long-term drug use is prone to drug dependence, headache, nausea, vomiting, loss of appetite, abdominal pain and other associated symptoms, which ultimately lead to defects in environmental psychological factors and social functions of children (Liu et al., 2022; Wang, 2019).

4.2 Psychosocial Intervention

Children with ADHD have poor academic performance, learning difficulties, and a tense relationship with children of the same age and family members. If ADHD is not treated in time, it will have a long-term impact on children's physical and mental health (Wu et., 2012). Social psychological factors play a very important role in the onset of ADHD, so it is also important to pay attention to psychological intervention. School and family are the two most common environments that people with ADHD are exposed to. Parents and teachers play an important role in therapy.

In the family, parents should change their coping behavior, establish appropriate reward and punishment system, reward appropriate behavior, and create a good family atmosphere. In school, teachers should cultivate ADHD children's attention, encourage ADHD children to participate in school activities, and help ADHD children establish good interpersonal relationships. At the same time, children with aggravated illness should be sent to professional psychological counseling or medical institutions for intervention and treatment to avoid further development of the disease. School and family cooperation is more beneficial for children with ADHD. Although non-drug treatment is extremely difficult to control children's sudden emotional agitation and behavioral abnormalities, long-term treatment can improve social function with more lasting stability and high safety compared with drug treatment (Li & Lu, 2015).

5. Conclusion

ADHD can cause different degree of functional impairment in learning, emotion, social interaction and life of children. The occurrence of ADHD children is the result of interaction of many factors. Therefore, multi-factors and multi-dimensional intervention should also be taken into account when intervening to treat ADHD children. Individualized treatment plans should be developed according to patients' conditions, and parents and teachers should actively cooperate with each other at home and at school.

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