

Chapter 2

Attention Deficit Hyperactivity Disorder (ADHD): Introduction, Mental Health Concerns, and Treatment

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ABSTRACT

Attention deficit hyperactivity disorder (ADHD) is the most common psychiatric condition in children. It comprises three core characteristics, namely inattention, hyperactivity, and impulsivity. The current chapter highlighted the comorbidity of ADHD with other psychiatric conditions like autism spectrum, learning disorders, bipolar disorder, externalizing problems, and sleep difficulties along with familial and academic difficulties. It also focused on the behavioral manifestation of ADHD including mental health issues like anxiety, depression, poor self-esteem, suicide, substance use, and sensory processing deficits. The common treatment for ADHD includes both pharmacological and non-pharmacological methods. Psychological treatment follows the use of behavioral principles used in operant conditioning. Parent and teacher training methods aim to empower them in regulating antecedents and consequences to bring desired changes in behavior. Other interventions discussed in the chapter are cognitive behavioral therapy and physical activity training.

INTRODUCTION

ADHD is a neurobehavioral condition characterized by clinically high levels of inattention, hyperactivity, and impulsivity. Symptoms appear in early childhood and in two-third of the cases, symptoms continue in modified forms to adulthood (Faraone et al., 2006). Symptoms can also vary in different settings like home and School. Persistence of symptoms into adulthood brings disruption in developmentally appropriate social, academic, and occupational spheres of life (Mannuzza and Klein, 2000).

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Hyperactivity in ADHD can be understood as restlessness or continuous fidgeting behavior, unable to sit quietly and excess movements like running, climbing, or talking. Impulsivity refers to impairment in the ability to delay response in the presence of the stimuli. Its behavioral manifestation would include difficulty waiting for their turn or standing in queues, interrupting other's speech, taking actions without giving proper thought. Inattention suggests the inability to maintain focus on a task, inability to provide close attention to details, and struggling with any other task requiring sustained attention span (Barkley, 1998).

Epidemiology

ADHD is one of the most common neurodevelopmental disorders of children. Epidemiological studies report ADHD to be present in 7-8 percent of the primary school-going children. It has a worldwide prevalence of 5-9 percent in children aged between 5-17 years. Prevalence in adults ranges from 2.5-4.4 percent. Studies indicate more prevalence in boys than girls with a ratio ranging from 3:1 to 9:1 (Polanczyk et al, 2014). First degree relatives of a child diagnosed with ADHD are more prone to be diagnosed than the general population.

Etiology

Historical theories of etiology focused on the 'minimal brain damage' hypothesis. Environmental and dietary factors were also focus of many etiological studies. Currently, studies focus on familial factors, genetic basis, and neuroimaging, neurochemical factors to determine a more specific cause of the condition (Gozal and Molfese, 2005).

Genetic studies indicate inheritability to be as high as 75 percent. Twin studies indicate a high concordance rate in monozygotic twins (51%) than dizygotic twins (33%). First degree relatives of ADHD child has increased risk of 2-8 times than the general population. Gene studies indicate the role of dopamine-related genes such as dopamine transporter gene or dopamine 4 receptor seven-repeat allele gene in the manifestation of ADHD. Another study support polygenic multiple threshold models, which states that ADHD is surfaced when an individual crosses the threshold level of liability (Rhee et al, 1999).

Neurochemical studies focus primarily on the role of dopamine in the prefrontal cortex indicated by its role in higher cognitive function and self-regulatory behavior. Higher accumulation of nor-adrenaline in the peripheral system provides dysfunctional feedback to the lower level of non-adrenaline in locus ceruleus (central noradrenergic system) is seen in the animal studies for inattention (Sadock and Sadock, 2015). This highlights the role played by the stimulant medication in the treatment of ADHD. The stimulant medication increases both dopamine and norepinephrine levels by increasing their release and blocking uptake (Engert and Pruessner, 2008). Studies using EEG data indicate increases beta and theta activity in the prefrontal cortex in youth with ADHD. These people also showed difficulty in emotional regulation (Clarke et al., 2011).

Many other studies question the methodological problems and interpretation in familial, twin adoption, and brain studies. Such studies postulate the potential role of non-genetic factors in the manifestation of ADHD (Furman, 2008). Developmental factors include premature birth, low birth weight, prenatal brain trauma, or inflammation due to infection prominently in the first trimester. Environmental factors involve exposure to toxins, lead, and maternal drinking and smoking during pregnancy.

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