Journal of Neuroscience and Neurodevelopmental Disorders (JNDD)

OLITES PUBLISHERS
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Short Communication

Attention-Deficit/Hyperactivity Disorder (ADHD): Contemporary Perspectives on Diagnosis, Neurobiology, and Management

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Citation: John R. Breaux, Attention-Deficit/Hyperactivity Disorder (ADHD): Contemporary Perspectives on Diagnosis, Neurobiology, and Management V1(1),2025

Received date: June 11, 2025: **Accepted date**:June 17, 2025: **Published date**: June 21 ,2025
Keywords: adrenal gland, aldosteronoma, Cushing's syndrome, hyperplasia, umbilicus

Abstract

Attention-Deficit/Hyperactivity Disorder (ADHD) is a prevalent neurodevelopmental condition characterized by persistent patterns of inattention, hyperactivity, and impulsivity that interfere with daily functioning and development. Although historically viewed as a childhood disorder, ADHD is now widely recognized as a condition that often persists into adolescence and adulthood. This short communication provides a comprehensive overview of ADHD, focusing on its epidemiology, clinical features, diagnostic criteria, underlying neurobiological mechanisms, and current management strategies. The paper also highlights challenges in diagnosis, the impact of comorbid conditions, and future directions for research and clinical practice. Improved awareness, early identification, and evidence-based, multimodal interventions are essential for optimizing outcomes and quality of life for individuals with ADHD

Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is one of the most common neurodevelopmental disorders, affecting individuals across different age groups, cultures, and socioeconomic backgrounds. It is characterized by developmentally inappropriate levels of inattention, hyperactivity, and impulsivity
that lead to functional impairments in academic, occupational, and social domains. ADHD has gained increasing attention in recent decades due to rising diagnosis rates, growing recognition of adult ADHD, and expanding research into its neurobiological and psychosocial foundations.This paper aims to provide a concise yet comprehensive discussion of ADHD suitable for a short communication format of approximately three to five pages. It synthesizes current knowledge on epidemiology, clinical features, etiology, diagnosis, and management, while also addressing challenges and future perspectives in ADHD research and care.

Epidemiology and Prevalence

ADHD is a global public health concern, with prevalence estimates ranging from 5% to 7% among children and adolescents worldwide. In adults, prevalence is estimated at approximately 2% to 5%, reflecting partial symptom remission and underdiagnosis in older populations. Variations in prevalence across regions are influenced by differences in diagnostic practices, cultural perceptions of behavior, and access to mental health services. Gender differences are notable in ADHD, particularly during childhood, where boys are diagnosed more frequently than girls, often at a ratio of approximately 2:1 or higher. Girls with ADHD are more likely to present with predominantly inattentive symptoms, which may be less disruptive and therefore underrecognized. In adulthood, the gender gap appears to narrow, suggesting that ADHD in females may be underdiagnosed earlier in life.

Clinical Features and Subtypes

The clinical presentation of ADHD is heterogeneous and varies across individuals and developmental stages. The core symptom domains include inattention, hyperactivity, and impulsivity.

Inattention

Symptoms of inattention include difficulty sustaining attention, frequent careless mistakes, disorganization, forgetfulness, and avoidance of tasks requiring

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prolonged mental effort. These symptoms often become more prominent in academic and occupational settings that demand sustained focus and executive functioning.

Hyperactivity and Impulsivity

Hyperactivity is characterized by excessive motor activity, fidgeting, restlessness, and an inability to remain seated when expected. Impulsivity involves difficulty waiting for turns, interrupting others, and acting without consideration of consequences. In adults, hyperactivity may manifest as internal restlessness rather than overt physical activity.

ADHD Subtypes

Based on symptom presentation, ADHD is commonly categorized into three presentations:

Predominantly Inattentive Presentation

Predominantly Hyperactive-Impulsive Presentation

Combined Presentation

These presentations are not static and may change over time, reflecting developmental influences and environmental demands.

Etiology and Neurobiological Mechanisms

ADHD is a multifactorial disorder resulting from the interaction of genetic, neurobiological, and environmental factors. Twin and family studies consistently demonstrate high heritability estimates ranging from 70% to 80%, indicating a strong genetic contribution.

Diagnosis and Assessment

The diagnosis of ADHD is 1primarily clinical and based on established diagnostic criteria, such as those outlined in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5-TR). Key diagnostic requirements include the presence of multiple symptoms before a specified age, symptom persistence across at least two settings, and clear evidence of functional impairment

Management and Treatment Strategies

Effective management of ADHD generally requires a multimodal approach that integrates pharmacological and non-pharmacological interventions

Pharmacological Treatment

Stimulant medications, such as methylphenidate and amphetamine-based formulations, are considered first-line treatments due to their well-established efficacy in reducing core ADHD symptoms. Non-stimulant medications, including atomoxetine and certain antidepressants, are alternative options for individuals who do not tolerate stimulants or have contraindications

Non-Pharmacological Interventions

Behavioral therapy, cognitive-behavioral therapy, psychoeducation, and parent training programs play a crucial role in ADHD management. Educational and workplace accommodations, such as structured routines and task modifications, can further enhance functioning and reduce impairment.

Lifespan Considerations

Treatment plans should be tailored to the individual's age, symptom profile, comorbidities, and personal goals. Ongoing monitoring and adjustment of interventions are essential, as ADHD symptoms and life demands evolve over time.

Challenges and Future Directions

Despite advances in understanding and treatment, several challenges remain in ADHD care. These include underdiagnosis in certain populations, stigma associated with the disorder, and limited access to specialized services. Additionally, variability in treatment response highlights the need for personalized approaches and further research into biomarkers and novel interventions. Future research should focus on elucidating the developmental trajectory of ADHD, improving diagnostic precision, and exploring innovative treatment strategies, including digital therapeutics and neurofeedback. Greater emphasis on public awareness and interdisciplinary collaboration will be critical in addressing the long-term impact of ADHD.

Conclusion

ADHD is a complex and heterogeneous neurodevelopmental disorder with significant implications across the lifespan. Recognition of its persistence into adulthood, combined with growing insights into its neurobiological underpinnings, has

transformed approaches to diagnosis and management. Early identification, comprehensive assessment, and individualized, multimodal treatment strategies are essential for reducing impairment and improving quality of life. Continued research and awareness efforts are necessary to address existing gaps and enhance outcomes for individuals living with ADHD.

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