Attention Deficit Hyperactivity Disorder in Adult Psychiatric Patients: Frequency and Functional Impairment

Thesis

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بسم الله الرحمن الرحيم

(قُل بفَضل اللهِ وَبرَحمَته فبذَلك فَليَفرَحُوا هُوَ خَيرُ

مما يَجمَعُون*٥٨*) سورة يونس

Abstract

Background: Attention deficit hyperactivity disorder (ADHD) in adults is missed diagnosis in psychiatric clinical practice. The evidence on persistence poses several difficulties for adult psychiatry considering the lack of expertise for diagnostic assessment, higher degree of comorbidity and limited treatment options.

Aim of the work: This study was conducted aiming at detecting the frequency of ADHD in adult psychiatric patients, detecting the frequency of psychiatric comorbidity as well as assessing the relation between adult ADHD and functional impairment.

Methods: The subjects of the study were taken consecutively from psychiatric outpatients clinics, screened for adult ADHD, and then they were divided into two groups according to presence or absence of adult ADHD.

Results: Adult ADHD Frequency in psychiatric patients reached 12.7% according to DSM-IV criteria and doubled (24%) when DSM-5 criteria were applied. Bipolar I disorder and substance use disorder were the highest presenting disorders with adult ADHD. Patients with adult ADHD had significantly higher levels of impairment and disability in work/academic performance, family relations and social relationship, as well as disorder severity. Predictors of adult ADHD in patients with bipolar I disorder were number of admissions and self neglect, in those with MDD were impairment in social relationships, self neglect and DSH, and in those with SUD were total impairment score on SDS and number of hospital admissions.

Conclusions: Adult ADHD often presents as an impairing underlying condition in adults, yet it is currently underdiagnosed and treated, leading to ineffective treatment and higher costs of psychiatric illness. It is recommended that clinicians sustain a high index of watchfulness for adult ADHD in their daily practice, factor ADHD screening into their routine psychiatric evaluations of patients with bipolar and SUD, and follow up definite adult ADHD subjects to assess the response to prescribed medications for ADHD and their effect on patients' performance.

Keywords: ADHA,SUD,MDD,CSTC, BDNF

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List of Abbreviations

• **ACC**	Anterior cingulate cortex
• **ADHD**	Attention Deficit Hyperactivity Disorder
• **ADORA2**	Adenosine A2A receptor
• **APA**	American Psychiatric Association
• **ASRS**	Adult ADHD Self Report Scale
• **BB**	Beta-Blockers
• **BDNF**	Brain derived neurotrophic factor
• **BP**	Blood Pressure
• **BD**	Bipolar Disorder
• **CBT**	Cognitive Behavioral Therapy
• **CGI**	Clinical Global Impression
• **CNS**	Central Nervous System
• **Camp**	cyclic Adenosine Monophosphate
• **COMT**	Catecholamine-O-Methyltransferase
• **CSF**	Cerebrospinal Fluid
• **CSTC**	Cortico-striato-thalamico-cortical
• **CT**	Computed Tomography
• **DAT**	Dopamine transporter
• **DAT1**	Dopamine transporter gene1
• **DRD2**	Dopamine receptor D2
• **DRD4**	Dopamine receptor D4
• **DIVA**	Diagnostic interview for ADHD in Adults
• **DSH**	Deliberate Self Harm
• **DSM-IV**	Diagnostic & Statistical Manual of Mental Disorder (4^{th}) Edition
• **DSM-III**	Diagnostic & Statistical Manual of Mental Disorder (3^{rd}) Edition
• **DSM-5**	Diagnostic & Statistical Manual of Mental Disorder (5^{th}) Edition
• **EAAC1**	Excitatory amino-acid transporter 1
• **ECG**	Electrocardiography
• **EEG**	Electroencephalography

• **ERN/Ne**	Error-related negativity
• **ERP**	Event-related potentials
• **FFA**	Free fatty acids
• **(f)MRI**	Magnetic resonance imaging
• **GABA**	Gamma-aminobutyric acid
• **GAD**	Generalized Anxiety Disorder
• **GWAS**	Genome-wide association studies
• **HKD**	Hyperkinetic disorder
• **HTN**	Hypertension
• **HTR2A**	Serotonin 2A receptor
• **ICD10**	International Classification of Diseases (10^{th}) Edition
• **ICD11**	International Classification of Diseases (11^{th}) Edition
• **MAO**	Monoamine Oxidase
• **MAO-A**	Monoamine-oxidase-A
• **MCPP**	M-chlorophenylpiperazine
• **MDD**	Major Depressive Disorder
• **MDE**	Major Depressive Episode
• **MEG**	Magnetoencephalography
• **MeS**	Metabolic Syndrome
• **MPFC**	Medial prefrontal cortex
• **MRS**	Proton magnetic resonance spectroscopy
• **MVAs**	Motor Vehicles Accidents
• **NAA**	N-acetylaspartate
• **NE**	Norepinephrine
• **NET**	Norepinephrine transporter
• **NICE**	National Institute for Health and Clinical Excellence
• **NMDA**	N-methyl D-aspartate
• **NST**	Subthalamic nucleus
• **NTRK2**	Neurotrophic tyrosine kinase receptor type 2
• **OCD**	Obsessive compulsive disorder
• **OFC**	Orbito-frontal cortex

• **PD**	Parkinson’s disease
• **PET**	Positron emission tomography
• **PFC**	Prefrontal cortex
• **PTSD**	Post Traumatic Stress Disorders
• **PUFA**	Poly unsaturated fatty acids
• **SCID**	Structured Clinical Interview using DSM-IV Criteria
• **SDS**	Sheehan Disability Scale
• **SER**	Serotonin transporter
• **SIDA**	Structured Interview for Diagnosis of adult ADHD
• **SLC1A1**	Glutamate transporter gene
• **SMA**	Supplementary motor areas
• **SNP**	Single-nucleotide polymorphism
• **SPECT**	Single-photon emission computed tomography
• **SRT**	Serial reaction time
• **SSRI**	Selective serotonin re-uptake inhibitors
• **SSRT**	Stop signal reaction time
• **SUD**	Substance Use Disorder
• **TCAs**	Tricyclic Antidepressants
• **TH**	Tyrosine hydroxylase
• **TPH2**	Tryptophan hydroxylase-2
• **VNTR**	Variable number tandem repeat
• **UK**	United Kingdom
• **WHO**	World Health Organization

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Introduction

Although ADHD in children was first recognized in the early 1900s**,** it was not until the 1970s that the disorder was recognized to persist into adulthood ***(Adler et al., 2006).*** ADHD is now understood to be a lifelong condition for most individuals. Unfortunately, many adults with ADHD are not being diagnosed, possibly due to insufficient diagnostic criteria, the complex presentation of the disorder as well as reluctance by physicians to diagnose the disorder in adults ***(Kieling and Rohde, 2012).***

Diagnosing ADHD in adults draws much of its legitimacy from the assumption that it is the same disorder as childhood ADHD, with the same neurodevelopmental etiology, affecting the same individuals from childhood to adulthood ***(Kooij et al., 2010).***

NICE (2008) and ***Stephen and Kevin (2008)*** stated that, despite the relatively high prevalence of adult ADHD, only 11% of adult patients are treated due to many reasons for underdiagnosis and underestimation of ADHD in adults:

First, many professionals working in adult mental health services might remain unaware that ADHD frequently persists into adult life and remain uninformed about the clinical presentation and the consequences of ADHD across the lifespan ***(Nutt et al., 2007).***

Second, ADHD in adults has the age-dependent change in the presentation of ADHD symptoms. The more overtly impairing symptoms in childhood, hyperactivity and impulsivity, often become less obvious in adulthood ***(Kooij et al., 2001).*** These more subtle symptoms such as inner restlessness, inattention, disorganization and impairment in behaviors related to executive functioning might lead to discontinuation of treatment when they are still required ***(Fischer et al., 2005).***

Third reason for underdiagnosis of ADHD includes the frequent presence of comorbid psychiatric syndromes, which in clinical practice might be identified as the primary or only diagnosis ***(Buitelaar, 2001).***

Finally, stigma and myths continue to surround the condition and its treatment, particularly with stimulant medication ***(Matthew and lebowitz, 2013)***.

However, the evidence on persistence of ADHD in adults poses several difficulties for adult psychiatry, considering the lack of expertise for diagnostic assessment, limited treatment options and patient facilities ***(Kooij et al., 2010).*** ***Safren (2006)*** noted that adults needed a different range of psychosocial and psychological treatments tailored to both their developmental and ADHD level.

DSM-5 places adult ADHD alongside childhood ADHD in the category of neurodevelopmental disorders, and states, "ADHD begins in childhood" ***(APA, 2013)***. Also, Consensus statements recommend treating adult ADHD on the grounds that it is a continuation from childhood ADHD ***(NICE, 2013).***

However, several studies suggested that the clinical profile and manifestations of ADHD evolve with age which raises questions about the stability of ADHD symptoms across time and the most appropriate diagnostic criteria for adults ***(Wolraich et al., 2005)***.

Pliszka (2007) indicated that due to this relatively high prevalence of ADHD compared with other psychiatric disorders, clinicians should sustain a high index of watchfulness and factor ADHD screening into all routine psychiatric evaluations.