Adult attention-deficit Hyperactivity disorder: From clinical reality toward conceptual clarity

ABSTRACT

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Received: 09 January 2021

Revised: 25 March 2021

Accepted: 29 March 2021

Published: 10 June 2021

There is ambiguity about the clinical picture and concept of attention-deficit hyperactivity disorder (ADHD) in adults. Relevant literature was extracted from various search engines, analyzed, and interpreted. Available literature suggests a significant prevalence of ADHD in the adult population affecting the quality of socio-occupational functioning. Inattentiveness was more commonly present than hyperactivity-impulsivity. Frequent comorbidities with other psychiatric disorders like anxiety disorders and substance use disorders were noted. Pharmacological management and psychotherapy have been found effective in its management. ADHD is a disorder across the lifespan and fairly prevalent among adults. Greater awareness and more research are required for a better understanding of Adult ADHD and its effective management.

Keywords: Adult attention-deficit hyperactivity disorder, assessment, management

Etiological and clinic-phenomenological paradigms in psychiatry have been changing, with newer scientific revelations and clinical consensus. The paradigm shift in attention-deficit hyperactivity disorder (ADHD) appears to have been swifter than the others. From a relatively uncommon hyperactivity reaction and a disorder of children, it has come a long way to now be seen as a widely prevalent, significantly comorbid, highly heritable disorder across the entire lifespan. Here, we follow its evolution as a clinical entity, review concerns which led researchers to a wider exploration of the construct, and the evolving treatment guidelines.

REVISITING ATTENTION-DEFICIT HYPERACTIVITY DISORDER: EVOLUTION OF THE CONSTRUCT

Early in the 20th century, ADHD was described as an abnormal defect in moral control of children.^[1] Subsequent research characterized ADHD as stemming from minimal brain dysfunction, leading to qualitative changes in the behavior of children.^[2] DSM II in 1968, gave it nosological legitimacy as “Hyperactivity reaction of childhood.”^[3] As late as DSM IV, ADHD was described as a disorder diagnosed in infancy, childhood, or adolescence.^[1] Subsequent research led DSM V describing ADHD as a

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How to cite this article: Prakash J, Chatterjee K, Guha S, Srivastava K, Chauhan VS. Adult attention-deficit Hyperactivity disorder: From clinical reality toward conceptual clarity. *Ind Psychiatry J* 2021;30:23-8.

Access this article online

Quick Response Code:

Website: www.industrialpsychiatry.org

DOI: 10.4103/ipj.ipj_7_21

disorder across the lifespan.^[4] From there arose the term Adult ADHD, which clinicians are still uncomfortable or unfamiliar with. Till DSM IV-TR, ADHD was recognized as a triad of symptom-clusters of inattention, hyperactivity, and impulsivity, with onset before 7 years of age and causing impairment in social, academic, and occupation functioning. The subtypes were predominantly inattentive, predominantly hyperactive-impulsive, and combined type.^[5]

DISQUIET WITH THE EXISTING PARADIGM

Clinicians and researchers noticed that many patients with ADHD carried symptoms over into adulthood, which affected their socio-occupational functioning adversely. Cherkasova *et al.* described that 60% of the children with ADHD continued to be symptomatic into adulthood.^[6] Researchers found the prevalence of ADHD in adults to be 4.4%–5.2% in the age group of 18–44 years and 2.8%–3.5% in older adults.^[7–10] Das *et al.* found the prevalence of Adult ADHD to be 2.2% in the age group of 68–74 years in comparison to 6.2% in the age group of 48%–52%.^[11] Kessler reported that 45.7% of children who had ADHD continued to meet the criteria in their adulthood, with 94.9% of them having the inattention symptom cluster and 34.6% having the hyperactivity-impulsivity symptom cluster.^[12] Decadal trend in a cohort study reported that the prevalence of Adult ADHD in the general population has risen from 0.43% in 2007 to 0.96% in 2016, and incidence rose from 9.43 per 100,000 person-year in 2007 to 13.49 per 100,000 person-year.^[13] A ten-country study of ADHD among adult population showed the mean prevalence of Adult ADHD to be 3.5%, ranging from 0.9% in Lebanon to 6.3% in France.^[14]

Causes of concern:

1. Increasing prevalence: Adult ADHD appears to be fairly prevalent in the general population (2.5%–5%) and is progressively increasing over the years^[8,10,15,16]
2. Underdiagnosed entity: Being a poorly understood and hardly explored by clinicians; many individuals with adult ADHD remain undiagnosed and continue to experience suffering. Studies have indicated that <20% of ADHD in adults is diagnosed or treated.^[10,17,18] About 17%–22% of adults reporting to psychiatric services reporting for other mental conditions have been found to have ADHD^[19–21]
3. High comorbidity: ADHD in adults is significantly comorbid with other psychiatric and medical conditions, which may lead to masking of either of the illnesses or adverse implications on the course of illness and treatment outcomes. Some studies have found comorbidity to be as high as 90% in Adult ADHD.^[22]

Common psychiatric comorbidities are depression, substance use disorders, generalized anxiety disorder, social phobia, specific phobia, panic disorder, bipolar disorder, dysthymia, obsessive-compulsive disorder, intermittent explosive disorder, and eating disorders. Among personality disorders, borderline, histrionic, narcissistic, and antisocial personality disorders are commonly comorbid. In the arena of medical comorbidities, hypertension, type II diabetes, obesity, asthma, and migraine are common.^[8,19,23–37] The presence of ADHD as a comorbid condition often adversely affects the course and outcome of these illnesses by way of early onset, increased severity, prolonged duration, increased complications, and chronicity or relapses.^[38–42] However, studies do suggest that timely appraisal and management of ADHD has affected the course and outcome of comorbid illness favorably^[9]

4. Socio-occupational dysfunction: Presence of ADHD in an adult, with or without comorbidity, can lead to significant socio-occupational dysfunction. It has been seen that adults with ADHD have lower educational attainment, inability to gain or maintain employment, and lesser productivity owing to poor management of time, procrastination, distraction, or absenteeism.^[43] An adult with ADHD is at an increased risk of colliding, over-speeding, violating traffic rules, and risk-taking behavior while driving.^[44,45] When Adult ADHD is comorbid with substance use disorder or antisocial personality disorder, increased criminality or problems with the law have been noted^[46]
5. High heritability: ADHD in adults has been found to have high heritability ranging from 75% to 91%.^[8,47] There is a 25.6% greater risk in parents, of children with ADHD, and 20.8% greater risk in a sibling.^[47]

ADULT ATTENTION-DEFICIT HYPERACTIVITY DISORDER: THE CURRENT CONSTRUCT

Studies have shown ADHD in adults to differ from ADHD in children, in some aspects. It has been observed that, with increasing age, inattentiveness tends to persist and has considerably lesser reduction than the hyperactivity-impulsivity symptom cluster.^[2] Inattention was clinically manifest as paying less attention to detail or being unable to manage time effectively. Hyperactivity was manifest as not being able to sit through meetings or frequent changes in jobs. Inattentiveness was seen as interrupting people, readiness to anger, and frequent job turnover.^[46–50] In addition, adults with ADHD have difficulty in modulating emotional responses, which may manifest as mood instability or lability.^[8] Many of these individuals choose an

organized spouse, select work of less potential or rigorously structure their schedule to cope better. These may mask the diagnosis, thus highlighting the importance of eliciting these compensatory behaviors in psychosocial history.^[48,51]

DSM V has modified the criteria to include older adolescents and adults in the ambit of ADHD, giving it a lifespan perspective. It has increased the age of onset from “before 7 years of age” to “before 12 years of age;” has lowered the required number of criteria from “6 out of 9” to “5 out of 9” for patients of age 17 and older; converted “evidence of impairment” to “evidence of symptoms in more than two settings;” and removed autistic spectrum disorder from the exclusion criteria.^[4]

ADULT-ONSET OR CHILDHOOD-ONSET ADULT ATTENTION-DEFICIT HYPERACTIVITY DISORDER: THE DEBATE

Although most research finds a considerable amount of Childhood ADHD continuing to adulthood; there is some research which suggests the onset of ADHD in adults, without any evidence of its presence in childhood. Pelota’s birth cohort study found that only 17% of childhood ADHD continued into adulthood and only 13% of young adults had onset of their ADHD in childhood.^[52] The New Zealand longitudinal cohort study indicated that 90%

of adults with ADHD have no history of ADHD in their childhood and 85% of childhood ADHD did not extend into adulthood. The study contemplated the condition representing two almost nonoverlapping groups.^[53] E-risk longitudinal twin study found that two-third of ADHD patients diagnosed at 18 years of age did not have ADHD in their early childhood. Studies found adult-onset ADHD to have female preponderance, in comparison to equivocal preponderance in childhood-onset Adult ADHD.^[54] The current research has failed to reach a consensus on regarding this variability in presentation across the lifespan. Evidence-based research is likely to provide greater clarity in future.

ASSESSMENT

Both screening and diagnostic instruments are available for the assessment of Adult ADHD. As a large number of individuals with Adult ADHD remain undiagnosed, the need for screening and training of primary-care physicians in identification, early intervention, and timely referral to mental health professionals cannot be overemphasized.

Available screening and diagnostic instruments are as brought out in Table 1.^[12,55-62] More robust clinician-friendly tools, with higher specificity and validity, need to be scoped through a better understanding of the Adult ADHD

Table 1: Instruments of assessment of adult attention-deficit hyperactivity disorder

Name of instruments	Type of instrument	Characteristics
Kooij screening questions ^[55]	Screening	4 questions
ASRS ^[56]	Screening	WHO compiled 18 items 6 item version available Specificity 96% Sensitivity 91.4%
WURS ^[57]	Screening	25 Items Scale Sensitivity 96% Specificity 96% Assesses ADHD and associated symptoms such as mood Provides retrospective account of childhood ADHD Often used in conjunction with ASRS
Conners Adult ADHD Rating Scale ^[58]	Screening	Sensitivity >90% Specificity >90% Overall discriminant validity was 69%
Adult ADHD Investigator Rating Scale ^[59]	Screening	18 item semi structured interview
DIVA 2.0 ^[60]	Diagnostic	Sensitivity - 90% Specificity - 83.3%
ACE+ ^[61]	Diagnostic	Semi structured interview Comprehensive interview for ADHD and co existing conditions
CAADID ^[62]	Diagnostic	Structured interview Good reliability and validity
Adult ADHD Clinical Diagnostic Scale ^[12]	Diagnostic	Semi structured interview

ADHD – Attention deficit hyperactivity disorder; ASRS – ADHD Self-Report Scale; CAADID – Conners adult ADHD diagnostic interview of DSM IV; ACE+ – ADHD child evaluation+; WURS – Wender Utah Rating Scale; DIVA – Diagnostic instruments of adult ADHD

construct across various phenomenological domains. False positivity in diagnosis remains a difficulty encountered by busy clinicians, which possibly leads to therapeutic nihilism from less than optimistic treatment outcomes.

MANAGEMENT

For the management of Adult ADHD, the major considerations which need to be addressed are the comorbidities, which are quite common. In addition, the treatment of ADHD has significant ramifications on the comorbid illness as well.^[63]

Disorder-specific approach primarily includes pharmacological intervention. The commonly used medication groups are stimulants with which up to 75% immediate improvement has been noted. These medications are however avoided in patients with comorbid substance abuse or recent-onset tics or seizures.^[64,65] Nonstimulant

medication takes longer for optimum effect.^[64-66] Various medication used for Adult ADHD is as brought out in Table 2.

Many nonpharmacological methods have been found useful. Recommended available methods are as per Table 3.

CONCLUSION

Growing evidence from research has shown a large number of cases of ADHD among the adult population, which are comorbid with psychiatric illnesses, affecting their course and outcome. The phenomenology of Adult ADHD reflects greater attentional impairment than involvement of the hyperactivity–impulsive symptom cluster. Adult ADHD can significantly affect the quality of socio-occupational functioning. Better awareness of this entity, its timely identification and effective management, will significantly impact those suffering from Adult ADHD, as well as the

Table 2: Medications for adult attention-deficit hyperactivity disorder

Medication	Types of formulations	Dosage
Stimulants		
Methylphenidate	Immediate release/short acting Sustained release/intermediate acting Extended release/long acting (pills/capsule) MPH patch	0.3-1.5 mg/kg/day Maximum 108 mg/day
Dextroamphetamine	Immediate release Sustained release Extended release (pills/capsules)	0.3-1.5 mg/kg Maximum 60 mg/day 20-60 mg/day
Nonstimulants		
Atomoxetine	Capsules	0.5-1.2 mg/kg/day Maximum 100 mg/day
Bupropion	Plain and extended release tablets	150-300 mg/day Maximum 450 mg/day
Desipramine	Tablet	1.5 mg/kg/day Maximum 300 mg/day
Clonidine	Plain and extended release tablets	0.1-0.3 mg/day
Guanfacine	Plain and extended release tablets	1-7 mg/day
Modafinil	Tablet	200 mg/day

ADHD – Attention deficit hyperactivity disorder; MPH – Methylphenidate

Table 3: Psychotherapy and other intervention in adult attention deficit hyperactivity disorder

Intervention	Salient features
Cognitive retraining ^[67]	Effect size was larger for inattention and impulsivity domains than for hyperactivity
Brain stimulation techniques ^[68]	Preliminary evidence is promising for transcranial magnetic stimulation and direct current stimulation; but needs replication
Psychotherapy ^[69, 64]	Cognitive behavior therapy has been found to be an useful adjunct to pharmacotherapy
Yoga; meditation and mindfulness-based therapy ^[70]	They have been found useful; but have not been replicated adequately
Nature therapy ^[71]	Green outdoor activities had more significantly reduction in symptoms than other settings
Nutritional supplements ^[72]	Fish oil; zinc; iron; and magnesium and complex carbohydrates; can improve brain function and reduce mood swings
Exercise ^[73]	Improves executive functions
ADHD coach ^[72]	Addresses unique challenges with the condition and helps acquisition of skills to overcome these
Neurobiofeedback ^[74]	Being used in some setups with significant benefits. Research evidence inadequate

ADHD – Attention-deficit hyperactivity disorder

comorbidities. The debate regarding childhood versus adult onset of Adult ADHD remains to be clarified through further research.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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