

Perspective

# Is Adult Attention-Deficit Hyperactivity Disorder Being Overdiagnosed?

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This review offers a perspective on the question as to whether attention-deficit hyperactivity disorder (ADHD) is being overdiagnosed in adults. Considering underlying causes as well as consequences, we conclude that the diagnosis of adult ADHD should be made cautiously, making use of multiple sources of information, including self-report, clinical interviews, collateral information, childhood documentation, and neuropsychological testing. Routine screening with symptom checklists is insufficient, and stimulant response is diagnostically uninformative. The causes of overdiagnosis may include changes in diagnostic thresholds, poor diagnostic practices, and advertising by the pharmaceutical industry. Overdiagnosis leads to overtreatment, and dramatic increases in prescriptions for adult ADHD during the last decade should arouse concern.



## Le trouble de déficit de l'attention avec hyperactivité est-il sur-diagnostiqué chez les adultes?

Cet article offre une perspective sur la question de savoir si le trouble de déficit de l'attention avec hyperactivité (TDAH) est sur-diagnostiqué chez les adultes. En tenant compte des causes sous-jacentes et des conséquences, nous concluons que le diagnostic de TDAH adulte devrait être posé avec prudence, en utilisant de multiples sources d'information, dont l'auto-évaluation, les entrevues cliniques, l'information auxiliaire, la documentation de l'enfance, et les tests neuropsychologiques. Le dépistage régulier avec des listes de symptômes ne suffit pas, et la réponse aux stimulants n'éclaire pas le diagnostic. Les causes du sur-diagnostic peuvent inclure des changements des seuils diagnostiques, de mauvaises pratiques diagnostiques, et la publicité de l'industrie pharmaceutique. Le sur-diagnostic mène au sur-traitement, et les augmentations radicales des prescriptions pour le TDAH adulte dans les dix dernières années devraient sonner l'alarme.

Overdiagnosis in psychiatry occurs where patients are identified with a mental disorder when they do not have significant impairment and would not be expected to benefit from treatment.<sup>1</sup> These problems can arise even when diagnostic criteria are met, that is, in the presence of milder symptoms that fall close to, or within, a normal range on a diagnostic spectrum.<sup>2</sup> Overdiagnosis can lead to unnecessary labelling, unneeded tests, unnecessary therapies, and inflated health care costs.<sup>1</sup> In medicine, with the best of intentions, practice has come to favour more tests and more treatments, all of which tend to drive overdiagnosis.<sup>2</sup> This problem may be worsened by a prevailing cultural ethos that more is better.<sup>1</sup>

Outside of psychiatry, there are clear examples of overdiagnosis. For example, screening programs designed to detect early stages of certain cancers appear to increase incidence estimates, but may have no discernable effect on mortality.<sup>3–7</sup> At the same time, sensitive diagnostic technologies identify ever-smaller, nonprogressing lesions, which can lead to incorrect diagnoses based on subclinical symptoms that rarely lead to overt illness, or incidentalomas.<sup>2</sup> Another example involves widened disease definitions owing to lowered thresholds, for instance in hypertension, which lead to a larger segment of the population being diagnosed and treated, with little evidence that they would benefit, but with measurable risks.<sup>2</sup>

Psychiatry has followed this trend. It has been estimated that at least 40% to 50% of the population will meet criteria for at least 1 psychiatric diagnosis during their lifetime.<sup>8</sup> The current system of nosology in psychiatry, based on phenomenology, that is, subjective reports and clinical observations, encourages overdiagnosis. The presence or absence of mental disorders is not defined by biomarkers, allowing diagnostic constructs to describe broad spectra that cross over into normality.<sup>9</sup>

## Increases in the Diagnosis of Adult Attention-Deficit Hyperactivity Disorder

The problem of establishing valid diagnostic boundaries is exemplified by adult ADHD. This disorder has been diagnosed routinely among children for decades, but frequent identification in adults, particularly in those who were never treated as children, is more recent.<sup>10</sup> The rationale for diagnosing adult ADHD is that more than half of all children who meet criteria for this disorder continue to have clinical symptoms in adulthood.<sup>11</sup> It does not follow, however, that the presence of attention problems in adults always justifies a diagnosis of ADHD, which requires a childhood onset.<sup>12</sup>

Adult ADHD, once considered rare, has now become very common. At the population level, the National Comorbidity Study estimated that 4.4% of adults in the United States meet diagnostic criteria.<sup>13</sup> However, this estimate of prevalence was based on the broad criteria listed in Diagnostic and Statistical Manual of Mental Disorders (DSM), Fifth Edition.<sup>12</sup> A rapidly increasing frequency of a once-rare condition may reflect increased recognition, but may also constitute a diagnostic epidemic.<sup>14</sup> This is because estimates of prevalence reflect how many people meet diagnostic criteria, but do not necessarily indicate how many people have significant impairment, and whose symptoms would be reduced substantively by treatment.

There is a vast body of literature on ADHD. We searched PubMed using key words related to adult ADHD and overdiagnosis, but could not find empirical articles directly addressing the question of overdiagnosis. We found only 3 nonempirical articles that even discussed it as a problem.<sup>14-16</sup> However, we did find articles suggesting that this condition is being underdiagnosed,<sup>17,18</sup> one of which suggested that 16.4% of the adult population could meet criteria if a diagnosis of broad ADHD were accepted.<sup>19</sup>

Similarly, we were not able to find any articles on how clinicians use criteria to make this diagnosis. The absence of gold standard measures for diagnosis is a general problem for psychiatry. In the absence of biomarkers, we

### Clinical Implications

- Overdiagnosis is a problem because it leads to overtreatment.
- The increasing diagnosis of adult ADHD could lead to stimulant prescriptions for people who would not benefit from them.
- The diagnosis of adult ADHD should be more systematic and carried out with caution.

### Limitations

- There is little research on overdiagnosis in adult ADHD.
- Little is known about the effects of long-term use of stimulants in adults, either potential benefits or possible harms.

are limited to assessing signs and symptoms. Moreover, the use of DSM algorithms tends not to be systematic, as shown when clinical diagnoses of major depression<sup>20</sup> or screening methods for bipolar disorder<sup>21</sup> are compared with the results of semi-structured interviews that closely follow the manual. No such studies have been carried out for ADHD, either in children or adults.

However, an important survey from the United States reported a 6-fold increase between 1994 and 2009 in the proportion of psychiatrist office visits with adult patients in which stimulants were prescribed,<sup>22</sup> and an 8-fold increase among nonpsychiatrists. A doubling of prescription rates between 2004 and 2009 in the United Kingdom has also been documented.<sup>23</sup> These dramatic changes most probably reflect changes in diagnostic practices and raise concern that some proportion of the increase may come from prescriptions to patients who would not be expected to benefit and, thus, reflect overdiagnosis.

## Pitfalls Leading to Overdiagnosis of Adult Attention-Deficit Hyperactivity Disorder

### Flawed Diagnostic Criteria

The DSM-5 criteria for adult ADHD are so broad that they fail to distinguish between illness and normal variation. But even if we were to accept these criteria as valid, the current definition is heterogeneous. It is well established that childhood ADHD responds best to stimulants when hyperactivity is most prominent, whereas inattentive symptoms are less responsive.<sup>24</sup> That suggests that ADHD, both in children and adults, is a syndrome, not a biologically distinct disease. This conclusion is supported by high comorbidity, a variable course, and a variable response to treatment.<sup>25</sup> These variations might best be viewed as identifying subgroups rather than additional diagnoses.

### Poor Diagnostic Practices

#### Failure to Consider the Differential Diagnosis

Attention is a core cognitive function that can be affected by many mental disorders.<sup>26</sup> ADHD is only one of these conditions, and DSM-5<sup>12</sup> lists several that need to be

### Abbreviations

ADHD	attention-deficit hyperactivity disorder
DSM	Diagnostic and Statistical Manual of Mental Disorders
PD	personality disorder
SUD	substance use disorder

considered in the differential diagnosis of adult patients: anxiety disorders, depressive disorders, bipolar disorder, SUDs, intermittent explosive disorder, stereotypic movement disorder, autism spectrum disorders, specific learning disorders, intellectual disability, and PDs.

Moreover, the comorbidity of adult ADHD is broad. The most comprehensive study<sup>27</sup> found high levels of mood disorders, anxiety disorders, SUDs, eating disorders, and PDs. There are little data on how these comorbidities impact on response to long-term pharmacological treatment. Failure to differentiate ADHD from other disorders and the treatment of ADHD without regard to comorbidity could reduce or negate treatment benefits, though little is known about the association between comorbidities and outcomes in adult ADHD.

### **Failing to Apply the Criterion for a Childhood Onset**

DSM-5<sup>12</sup> requires that ADHD in adults begin in childhood: inattentive or hyperactive-impulsive symptoms must have been present before age 12. This revised age requirement somewhat widens the diagnostic criteria; DSM-IV required an onset prior to age 7. However, one cannot have adult ADHD without first having childhood ADHD.

Confirming the presence of a childhood diagnosis in adult patients based on long-term recall is not a valid procedure. It is well known that memories of past problems are strongly coloured by present symptomatology.<sup>28</sup> Thus adult patients with symptoms may claim that they had the same problems with attention during childhood, but that they were not recognized. However, given the high level of interest in diagnosis during the last several decades, this may not be very likely. Another problem is that when a child is diagnosed with ADHD, parents may assume that they have the same disorder, even if they have never been diagnosed with it. This is also unlikely: mental disorders have a complex inheritance, and the best estimate of heritability for adult ADHD is 30% to 40%.<sup>29</sup>

One way to improve validity for assessing childhood onset is to obtain collateral information, for example, from parents. It is probably even more important to examine school records to determine what teachers observed, and to show that symptoms caused functional impairment in the school environment.<sup>11</sup> Finally, one can attempt to determine whether patients were assessed and treated for ADHD as children, and whether they had a clear response to therapy.

As all of these methods are limited by recall bias, childhood symptoms should be assessed using multiple methods. In the absence of a gold standard, the diagnosis of ADHD requires a higher threshold. The failure to do so could easily lead clinicians to misdiagnose other problems as ADHD or to diagnose ADHD when there is no mental disorder.

### **Relying on Screening Tools and Psychological Assessments**

Screening questionnaires and rating scales are often used to validate a clinical diagnosis of adult ADHD. However, screening tools are designed to cast a wide net to identify

patients who might benefit from professional assessment. By design, they have a built-in, high false-positive rate.<sup>30</sup> As only a proportion of people who are identified as having ADHD by a screening test actually meet diagnostic criteria, these tools cannot, by themselves, be relied on to validate a diagnosis. Thus, although the Connors checklist<sup>31</sup> is a convenient screener for nonprofessionals, it should not be used as a validator of diagnosis.

The same limitations apply to psychological testing. These procedures, which use psychometrically tested instruments and provide more detail than clinical assessments, can be used as one element in a comprehensive assessment, but tend to be expensive in practice. Most, including the popular Continuous Performance Test,<sup>32</sup> lack specificity, meaning that, like screening tools, they cast the net too wide for the purpose of diagnosis. In the absence of a clear understanding of endophenotypes, psychological testing cannot provide a gold standard.

### **Overestimating Treatment Benefits Among Patients Treated in Practice**

Clinical trials and meta-analyses show that there can be benefits from treating patients who meet criteria for adult ADHD with stimulants.<sup>33-37</sup> However, no long-term studies have been conducted.<sup>38</sup> It is also not known whether results obtained in randomized trials translate into effectiveness in broader clinical populations. Also, while stimulants seem to be relatively safe drugs,<sup>39</sup> there are no studies examining risk when adults take them over many years.

While it was once thought that a paradoxically calming effect from stimulants supports a diagnosis of ADHD, these agents can increase attention and focus in normal people.<sup>40</sup> Thus, as stimulant responses are nonspecific, they are diagnostically uninformative. Moreover, as many report a subjective experience that does not correspond to results of formal testing,<sup>41</sup> one must consider the possibility that placebo responses could be more common in clinical practice than in formal trials. Thus one cannot use response to these drugs as a validator of the diagnosis.

### **Nonmedical Benefit Seeking**

#### **Medicalizing Attention**

Society increasingly demands a high level of performance on tasks that require sustained attention and multitasking.<sup>14</sup> Thus social forces, such as competition in school settings, can motivate patients to seek stimulant prescriptions, which, in turn, require a diagnosis of ADHD. Indeed, it is well established that stimulants are being passed from one person to another outside of the medical system.<sup>42</sup>

Many symptoms of adult ADHD show only subtle differences from normal features of acceptable young adult behaviour.<sup>43</sup> ADHD, like many other mental disorders, can be understood as a set of traits that are continuous with normality. As with any trait, one sees a range of normal variation, in which higher levels are consistent with good functioning in some environments, while lower levels are

consistent with functioning in other situations. High levels of activity and attention are needed for tasks requiring a rapid response, but are dysfunctional when performing tasks that require persistence and patience. These variations in requirements for attention are likely to be socially and culturally relative.

The prevalence of ADHD in children shows a striking variance across cultures.<sup>23</sup> It is most frequently diagnosed in North America, is less prevalent in many parts of Europe, and is rarely identified in developing countries. This disparity has been interpreted as reflecting the failure of physicians in other countries to identify the disorder.<sup>19</sup> Alternatively, real differences in prevalence could depend on the nature of sociocultural demands, or on genetic differences between populations.

### Disability Benefits

Receiving a diagnosis of ADHD may make it possible for some adults to be considered disabled, and to receive benefits. Although the data supporting this conclusion are sparse, it is not uncommon for university students to receive extra time for papers or even double time for completing examinations if they are diagnosed either with a learning disability or with ADHD.<sup>44</sup>

### Benefits to Nonpatient Stakeholders

Researchers have a tendency to overestimate the prevalence of clinical disorders to justify requests for funding. They are likely to claim that a condition is much more common than generally recognized, but is currently being undertreated. This may well have been the case for adult ADHD.

Also, it may not be coincidental that increased diagnosis coincided with the marketing of new stimulants.<sup>17</sup> The diagnosis of adult ADHD has been actively promoted by the pharmaceutical industry, with gratifying results for their business model. Community groups, some of which receive funding from pharmaceutical companies that make stimulants, also promote increased diagnosis and pharmacological treatment. This may help account for rises in the prescription of stimulants in adult clinical populations.<sup>45,46</sup>

### Modern Culture and Medicalization

We live in an era in which normal life problems are increasingly medicalized. Information available on the Internet may have made this problem even more widespread. The use of stimulants to increase performance in people who do not have a mental disorder could be an example of cognitive enhancement through psychopharmacology.<sup>47</sup>

## The Need for a More Cautious Diagnosis of Adult Attention-Deficit Hyperactivity Disorder

The increase in the prevalence of adult ADHD reflects the effects of many forces. Physicians are faced with complex

clinical problems for which a simple solution, leading directly to a prescription, is a tempting option.

The absence of objective measures for the diagnosis of adult ADHD suggests a need for caution, as well as a more systematic approach using self-report, clinical interviews, collateral information, childhood documentation, and, when available, neuropsychological testing. Given that this kind of assessment is unlikely to happen outside of research clinics or private clinics, clinicians should at least require collateral information and solid evidence for a childhood onset. We suggest even more caution when these data are absent or unavailable.

The main concern about overdiagnosis is overtreatment. More research is needed on the impact of increased stimulant prescription on adult patients receiving a treatment that can be maintained for years or decades, a period of time that has not yet been examined in research.<sup>47</sup>

It may be argued that even if stimulant treatment is given to normal people, it need not be withheld if it is effective in improving performance. However, as long as there is little long-term follow-up research to determine the effects of administration of these drugs over years, clinicians should be cautious.

The question is whether stimulants are being prescribed to increase attention and focus in people with other diagnoses, or with no diagnosis. As clinical trials focus on the short-term treatment of classical cases of ADHD, research has not yet been able to provide an answer.

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