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REVIEW

Attention deficit hyperactivity disorder in adults: what the non-specialist needs to know

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Abstract

Attention deficit hyperactivity disorder is a persistent, pervasive neurodevelopmental disorder, characterised by the core features of hyperactivity, impulsivity and inattention. While previously thought to be a condition that only affects children, it is now well recognised that in a significant proportion of cases both symptoms and associated impairment will persist into adulthood. Nevertheless, many cases are missed or misdiagnosed because of the lack of awareness of attention deficit hyperactivity disorder as a potential diagnosis in adults, the number of symptoms that overlap with other psychiatric conditions, and the high rates of comorbidity. However, once correctly diagnosed, attention deficit hyperactivity disorder responds well to treatment, particularly pharmacological intervention. This article gives an overview of attention deficit hyperactivity disorder with special emphasis on the diagnosis and pharmacological treatment of attention deficit hyperactivity disorder in adults.

Key words: Attention deficit hyperactivity disorder; ADHD; Adults; Assessment; Treatment

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Introduction

The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines attention deficit hyperactivity disorder as 'a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development' (American Psychiatric Association, 2013). The International Classification of Diseases (ICD-10) uses the term hyperkinetic disorder instead of attention deficit hyperactivity disorder and defines it as 'a persistent and severe impairment of psychological development'. 'It is characterised by early onset, a combination of overactive, poorly modulated behaviour with marked inattention and lack of persistent task involvement, and pervasiveness over situations and persistence over time of these behavioural characteristics' (World Health Organization, 1993). DSM-5 diagnostic criteria are the ones widely used in the UK.

Although attention deficit hyperactivity disorder was once considered to be a childhood disorder that almost always improves with age (Biederman et al, 2000), it is now recognised to persist into adulthood in 50–66% of individuals (Barkley et al, 2002; Lara et al, 2009). Furthermore, the severity of childhood symptoms (Lara et al, 2009), psychosocial adversity and psychiatric comorbidities (Biederman et al, 2012) predict its persistence into adulthood.

Attention deficit hyperactivity disorder in adults is often under-diagnosed and hence under-treated. Reasons for this include lack of awareness and misunderstanding of the disorder, age-related changes in symptom presentation and presence of psychiatric comorbidities that might hide or mask symptoms of attention deficit hyperactivity disorder (Kooij et al, 2010). This article introduces adult attention deficit hyperactivity disorder to the non-specialist and provides an overview of its assessment, diagnosis and treatment.

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Epidemiology

In a World Health Organization study across 10 countries in the Americas, Europe and the Middle East, the prevalence of attention deficit hyperactivity disorder in adults aged 18–44 ranged from 1.1% to 7.3% (Fayyad et al, 2007). Varying population and cultural characteristics, methodological differences and variability in the diagnostic criteria used could explain such different prevalence rates. Adult attention deficit hyperactivity disorder

is more common in men than women (1.6:1) (Willcutt, 2012) but interestingly, they both present with similar numbers of symptoms and similar clusters of symptoms of inattention, impulsivity and hyperactivity (Biederman et al, 2004).

The National Institute for Health and Care Excellence (2018) guidelines noted that that the prevalence of attention deficit hyperactivity disorder was higher in certain groups than in the general population: those with epilepsy, a family history of attention deficit hyperactivity disorder, neuro-developmental disorders, history of substance use, mental health disorders and those known to the criminal justice system. Hence it is important for people working with these groups to be aware of symptoms of adult attention deficit hyperactivity disorder, to avoid missing the diagnosis. High rates of psychiatric comorbidity are consistently found, varying from 40% to 80%. The most common psychiatric disorders comorbid with adult attention deficit hyperactivity disorder are anxiety disorders, personality disorders, learning disabilities, mood disorders and substance use disorders (Kooij et al, 2012).

Adult attention deficit hyperactivity disorder adversely affects the individual, his/her family and the wider society. Examples of areas affected include education (poor educational achievement, problems in school or college), employment (problems at work, reduced work efficiency, poor productivity), occupational status, finances (financial difficulties), family and relationships, health resource usage (high medical, social, education and criminal justice system costs) and overall quality of life (Kooij et al, 2010; Lichtenstein et al, 2012).

Aetiology

Attention deficit hyperactivity disorder is multi-factorial in origin with genetic and environmental risk factors at play. The presence of an underlying genetic component is supported by large-scale studies of Swedish adult twins (Larsson et al, 2013, 2014). However, studies of biomarkers have so far been inconclusive. Some environmental risk factors for attention deficit hyperactivity disorder include pregnancy and early childhood risk factors (premature birth, low birth weight, maternal smoking during pregnancy) and socioeconomic risk factors (lower socioeconomic strata, single-parent home, maternal depression, antisocial behaviour in the father). Current thinking is that attention deficit hyperactivity disorder is the result of complex interactions between genetic and environmental influences. Such interactions may explain individual differences in response to environmental risk factors.

Assessment

In a case of suspected attention deficit hyperactivity disorder, a comprehensive assessment is essential to formulate an effective treatment strategy. This consists of:

- Thorough history taking
- Collection of corroborative information
- Psychiatric interview
- Comprehensive clinical examination
- Assessment of medical and psychiatric comorbidity
- Observation of behaviour
- Assessment using rating scales
- Identify patient and family needs.

In order to complete an assessment for attention deficit hyperactivity disorder a thorough developmental history must be taken, including collateral history from a close friend or relative wherever possible. Copies of school reports or work appraisals should also be sought. Use of attention deficit hyperactivity disorder rating scales such as the Barkley's Adult ADHD Rating Scale (Barkley and Murphy, 2011) or the Adult ADHD Self-report Rating Scale (Kessler et al, 2005) may be beneficial but should only ever be used as an adjunct, rather than as a replacement for clinical judgement.

Symptoms of attention deficit hyperactivity disorder can overlap with those of a number of other mental health conditions, which can make diagnosis difficult (Kooij et al, 2012; Canadian ADHD Resource Alliance, 2018). Adult patients often present with secondary mental health problems such as anxiety and depression by the time they get to specialist

attention deficit hyperactivity disorder services. A detailed account of the various symptoms is given in the DSM-5 diagnostic criteria (Figure 1).

Screening for attention deficit hyperactivity disorder in non-specialist settings

The World Health Organization recommends the Adult ADHD Self-Report Scale (ASRS-v1.1) for screening purposes (Kessler et al, 2005). This consists of 18 questions and the first six (part A; Table 1) are the most predictive of symptoms consistent with attention deficit hyperactivity disorder. Ask the patient to mark an X in the box that most closely represents the frequency of occurrence of each symptom in the past 6 months. If four or more marks appear in the darker blue boxes in part A, the patient has symptoms highly consistent with attention deficit hyperactivity disorder and further investigation is warranted.

Diagnosis

In the UK, DSM-5 criteria (Figure 1) are used as the basis for diagnosing attention deficit hyperactivity disorder in adults.

A. A persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development, as characterised by (1) and/or (2):

1. **Inattention:** Five (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:
   - **a.** Often fails to give close attention to details or makes careless mistakes in schoolwork, at work, or during other activities
   - **b.** Often has difficulty sustaining attention in tasks or play activities
   - **c.** Often does not seem to listen when spoken to directly
   - **d.** Often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace
   - **e.** Often has difficulty organising tasks and activities
   - **f.** Often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort
   - **g.** Often loses things necessary for tasks or activities
   - **h.** Is often easily distracted by extraneous stimuli
   - **i.** Is often forgetful in daily activities
2. **Hyperactivity and impulsivity:** Five (or more) of the following symptoms have persisted for at least 6 months to a degree that is inconsistent with developmental level and that negatively impacts directly on social and academic/occupational activities:
   - **a.** Often fidgets with or taps hands or feet or squirms in seat
   - **b.** Often leaves seat in situations when remaining seated is expected
   - **c.** Often runs about or climbs in situations where it is inappropriate
   - **d.** Often unable to play or engage in leisure activities quietly
   - **e.** Is often 'on the go,' acting as if 'driven by a motor'
   - **f.** Often talks excessively
   - **g.** Often blurts out an answer before a question has been complete
   - **h.** Often has difficulty waiting his or her turn
   - **i.** Often interrupts or intrudes on others

B. In addition to the requirement for five or more symptoms of inattention and/or hyperactivity-impulsivity the following criteria must also be met:

1. Several inattentive or hyperactive-impulsive symptoms were present before age 12 years
2. Several inattentive or hyperactive-impulsive symptoms are present in two or more settings
3. There is clear evidence that the symptoms interfere with, or reduce the quality of, social, academic, or occupational functioning
4. The symptoms do not occur exclusively during the course of schizophrenia or another psychotic disorder and are not better explained by another mental disorder

Figure 1. Diagnostic criteria for attention deficit hyperactivity disorder. From Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (American Psychiatric Association, 2013)

Table 1. Extract from the adult attention deficit hyperactivity disorder self-report scale (ASRS-v1.1)

	Never	Rarely	Sometimes	Often	Very often
1. How often do you have trouble wrapping up the final details of a project, once the challenging parts have been done?					
2. How often do you have difficulty getting things in order when you have to do a task that requires organisation?					
3. How often do you have problems remembering appointments or obligations?					
4. When you have a task that requires a lot of thought, how often do you avoid or delay getting started?					
5. How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?					
6. How often do you feel overly active and compelled to do things, like you were driven by a motor?					

Attention deficit hyperactivity disorder can be further classified into three different subtypes; inattentive (20–30% of cases), hyperactive-impulsive (15% of cases) and combined (50–75% of cases).

Prognosis

A meta-analysis by Faraone et al (2006) showed that on reaching 25 years of age approximately 15% of individuals with childhood attention deficit hyperactivity disorder retained the full diagnosis and approximately 65% were in 'partial remission'. Those in partial remission continued to have persistence of some symptoms and continuing functional impairment, such as psychological, social or educational difficulties. Attention deficit hyperactivity disorder is a very treatable condition, and pharmacological interventions are recommended first-line treatments for adults. Effect sizes of medications in attention deficit hyperactivity disorder treatment are 0.6–0.9 for stimulant medications, which is high compared to other commonly used psychiatric medications such as antidepressants (effect size 0.3–0.5) (Leucht et al, 2012).

Despite this, the provision of assessment and treatment services for adult attention deficit hyperactivity disorder varies greatly depending on local commissioning arrangements, and waiting lists to access services are often long. Medications often tend to be discontinued when children with attention deficit hyperactivity disorder reach the age of 16 or 18 years, as they are discharged from children's treatment services. There is an ongoing debate as to whether assessment and treatment services for attention deficit hyperactivity disorder should be set up and run as specialist services or if they ought to be part of generic psychiatric services.

Pharmacological treatment of attention deficit hyperactivity disorder in adults

In the UK medication options for the treatment of attention deficit hyperactivity disorder in adults include stimulant medications (methylphenidate, dexamfetamine and lisdexamfetamine) and non-stimulant medications (atomoxetine and guanfacine). These medications increase extra-neuronal dopaminergic and/or noradrenergic activity, with the prefrontal cortex thought to be the brain region with particular significance. Guanfacine will not be covered in detail in this article because it is not licensed for use in adults and National Institute of Health and Care Excellence guidelines recommend that it is only used in adults following the advice of a tertiary referral centre for attention deficit hyperactivity disorder.

The broad differences between stimulant and non-stimulant medications are summarised in Table 2. While some of these medications do not have a UK license

Table 2. Comparison of stimulants and non-stimulants

Stimulant medications	Non-stimulants
Act on dopamine and noradrenaline	Acts primarily on noradrenaline
Short time to therapeutic effect	Takes several weeks to have a therapeutic effect
Eliminated from the body by the end of each day	Offer 24-hour symptom control
Do not need to be taken every day, eg can be taken on work days and missed at weekends	Should not be stopped suddenly
Schedule 2 controlled drugs	Not schedule 2 controlled drugs
Risk of abuse/diversion	No abuse potential

Table 3. Available formulations of long-acting methylphenidate

Brand(s)	Percentage of drug as immediate (%)	Percentage as modified release (%)	Time to peak plasma levels	Total duration of action	Product licence
Concerta XL Matoride XL Xenidate XL Xaggitin XL Delmosart MR	22	78	First peak at 1–2 hours Second peak at 6–8 hours	Up to 12 hours	Children Adult continuation licence
Equasym XL	30	70	First peak at 1.5 hours Second peak at 6 hours	Up to 8 hours	Children
Medikinet XL	50	50	Rapid initial peak followed by a second peak after 3–4 hours	Up to 8 hours	Adults and children

From Bradley (2016); Joint Formulary Committee (2020)

for the treatment of attention deficit hyperactivity disorder in adults there is a growing body of evidence to support their use. This is reflected in National Institute of Health and Care Excellence (2018) and British Association of Psychopharmacology guidance (Bolea-Almanac et al, 2014).

Stimulant medications

Methylphenidate is thought to work by blocking reuptake of serotonin and noradrenaline into the presynaptic neuron, thereby making more available in the synaptic space.

Methylphenidate is available in an immediate release formulation, as well as a choice of long-acting biphasic release preparations, which contain a proportion of the drug as immediate release and a further proportion as modified release methylphenidate, allowing treatment to be tailored to the needs of the individual. Different formulations have different product licenses and Table 3 summarises the different modified-release preparations available.

Dexamfetamine is an immediate release stimulant medication which is thought to act both by blocking the reuptake of noradrenaline and dopamine into the pre-synaptic neurone and by increasing the release of noradrenaline and dopamine into the synaptic space. Because of its rapid absorption and short duration of action it has the potential to be abused, and so is contraindicated in patients with a history of drug or alcohol abuse. Dexamfetamine is not currently licensed for use in adults.

Lisdexamfetamine is a long acting pro-drug formulation of dexamfetamine that is licensed for use in adults and has a long duration of action (12–14 hours). Lisdexamfetamine is pharmacologically inactive until hydrolysed by the red blood cells to dexamfetamine following oral absorption. This process of hydrolysis is rate limited, significantly reducing

Table 4. Factors affecting choice of medication
Preferred duration of action – short or long acting depending on work or study demands? Will they remember to take two or three doses per day or would a once a day formulation be preferable?
Time to onset of action – will the patient persevere with atomoxetine long enough to get the therapeutic benefit? Will the patient remember to take it every day?
Risk of abuse – long-acting stimulants or atomoxetine preferred
Is there a need to take medication every day or is there a preference to be able to miss some days?

the abuse potential of lisdexamfetamine compared to dexamfetamine, even if ingested by other routes, for example intravenously or intranasally.

The common side effects of stimulant medications include anorexia, abdominal pain, and small average increases in heart rate and blood pressure. Patients should be advised to take their stimulant medication in the morning to allow it to have left their system by bedtime, thereby reducing the risk of insomnia as a side effect. However, for some patients, where initial insomnia is a problem because of a 'racing mind', addition of an evening dose of an immediate release stimulant may be beneficial.

Non-stimulant medications: atomoxetine

Atomoxetine is licensed for the treatment of attention deficit hyperactivity disorder in adults and acts by blocking the re-uptake of noradrenaline via the pre-synaptic noradrenaline transporter, thereby enhancing concentrations of noradrenaline in the synaptic space. Atomoxetine takes 2–4 weeks to exert a therapeutic effect and is a useful option where there are concerns regarding risk of misuse or diversion.

It is estimated that 7% of the Caucasian population are poor metabolisers of atomoxetine, resulting in an increase in half-life from 4–21 hours (Accord-UK Ltd, 2020). Poor metabolisers are far more susceptible to side effects of atomoxetine, which may cause them to discontinue taking it, even at very low doses.

Table 4 summarises some of the main points that need to be considered when discussing choice of medication with the patient.

Medication titration and monitoring

Before starting attention deficit hyperactivity disorder medications patients should be screened for personal or family history of cardiac disease including personal history of cardiac surgery or abnormalities, history of breathlessness on exertion compared to peers, fainting because of fright or noise, chest pain and palpitations or history of sudden death in a first degree relative under the age of 40 years. A cardiology opinion should be sought if there are any concerns. Atomoxetine has the potential to increase the QTc interval and so a baseline electrocardiogram should be considered if the patient is prescribed other medications which may also prolong QTc interval.

Table 5 summarises the monitoring that should take place and actions that should be considered if there are any concerns.

Efficacy of attention deficit hyperactivity disorder medications in adults

Attention deficit hyperactivity disorder is a very treatable condition, with low numbers needed to treat compared to other commonly used psychotropic medications. Faraone and Glatt (2010) showed that stimulants have a lower number needed to treat than non-stimulants, supporting the guidance to use stimulants first line unless there are contraindications or concerns.

In a network meta-analysis Cortese et al (2018) found greater evidence of efficacy for methylphenidate in children and amphetamine formulations in adults with attention deficit hyperactivity disorder. However, at present there is still no way of anticipating whether an individual will respond better to methylphenidate or lisdexamfetamine as a first-line treatment option and so patient preference remains an important aspect of decision making.

Table 5. Monitoring requirements for stimulants and atomoxetine

Monitoring	Frequency	Action in case of concerns
Weight	Monitor before and after each dose increase and every 6 months thereafter	If clinically significant weight loss: ■ Advise patient to take medication with or after food ■ Encourage eating extra snacks once effects of stimulant medication have worn off ■ Consider use of short-acting stimulant medication if appropriate ■ Consider referral to a dietician ■ Consider changing to an alternative medication
Pulse	Monitor before and after each dose increase and every 6 months thereafter	■ If sustained resting tachycardia (>120 beats per minute) or a clinically significant increase on more than two occasions reduce dose and refer to cardiologist ■ Consider change of attention deficit hyperactivity disorder medication
Blood pressure	Monitor before and after each dose increase and every 6 months thereafter	■ If blood pressure >140/90 mmHg on more than two occasions, or if clinically significant increases, reduce dose and ask GP to review blood pressure management ■ Consider change of attention deficit hyperactivity disorder medication
Development of any new or worsening psychiatric comorbidities including anxiety, psychosis	Monitor at each review	■ If new or worsening psychotic symptoms stop attention deficit hyperactivity disorder medication and treat psychosis before considering cautious re-challenge ■ If new or worsening anxiety use a slower dose titration. Consider if anxiety is a result of attention deficit hyperactivity disorder medication or of attention deficit hyperactivity disorder symptoms returning as medication wears off. Consider change of medication or treating anxiety as a comorbid condition
Sleep	Monitor at each review	■ If sleep problems worsened by medication ensure stimulants are being taken early in the day ■ Consider using a shorter acting formulation ■ If sleep disturbance is as a result of symptoms returning when medication has worn off consider adding a short-acting stimulant at teatime
Development of new or worsening tics	Monitor at each review	■ Consider whether the tics are related to the stimulant medication or atomoxetine; if so weigh up the benefits of continuing the medication with the impairment caused by the tics ■ If atomoxetine or stimulant medication cannot be tolerated consider contacting a tertiary attention deficit hyperactivity disorder service for advice
New or worsening seizures	Monitor at each review	■ Stop attention deficit hyperactivity disorder medication if this could be contributing to seizures ■ Consider whether any other medications that the patient is prescribed could also be contributing ■ Seek neurology opinion
Risk of abuse or diversion, including for cognitive enhancement or appetite suppression	Monitor at each review	■ Do not prescribe short-acting stimulants ■ Consider use of a modified release stimulant or atomoxetine ■ Consider limiting duration of prescriptions
Attention deficit hyperactivity disorder symptom control	Monitor at each review	■ Consider repeating rating scales to compare effect of different doses ■ Ensure dose adequately optimised ■ Consider changing medication if symptoms are poorly controlled despite optimum dose

Table 6. Treatment of attention deficit hyperactivity disorder in adults
Individuals with attention deficit hyperactivity disorder require a comprehensive, holistic shared treatment plan that addresses psychological, behavioural and occupational or educational needs
Care should be provided by multidisciplinary teams and/or clinics with expertise in the diagnosis and management of attention deficit hyperactivity disorder
Medication should be offered first line for adults if their symptoms are still causing a significant impairment in more than one domain after environmental modifications. Lisdexamfetamine or methylphenidate should be offered as first-line treatment choices. Atomoxetine is recommended as a second-line option

From National Institute for Health and Care Excellence (2018)

National Institute for Health and Care Excellence guidance

In the UK, evidence-based National Institute for Health and Care Excellence guidelines for the diagnosis and management of attention deficit hyperactivity disorder were first produced in 2008 and were updated in 2018. These state that drug treatments should usually be offered as first line for the treatment of attention deficit hyperactivity disorder in adults, unless the patient would prefer a psychological approach, because of the limited evidence supporting the effectiveness of psychological therapy in adults.

Treatment of attention deficit hyperactivity disorder should follow the principles outlined in Table 6:

Non-pharmacological interventions for attention deficit hyperactivity disorder

While the effectiveness of pharmacological treatment of attention deficit hyperactivity disorder in adults has been clearly demonstrated, there is also a growing body of evidence to support the use of non-pharmacological approaches, particularly in combination with pharmacological treatment. In the European consensus statement on the diagnosis and treatment of adult attention deficit hyperactivity disorder Kooij et al (2019) highlight evidence from more than ten randomised controlled trials and a meta-analysis that support the evidence for group or individual cognitive behavioural therapy, including an element of psycho-education, in reducing the core symptoms of attention deficit hyperactivity disorder.

Comorbid symptoms such as anxiety and depression and other symptoms that are often associated with attention deficit hyperactivity disorder, such as emotional dysregulation, may also be expected to improve with the use of cognitive behavioural therapy. Bearing in mind the high rates of comorbidity with attention deficit hyperactivity disorder, cognitive behavioural therapy is likely to benefit a significant proportion of adults who have attention deficit hyperactivity disorder. The evidence for positive outcomes with cognitive behavioural therapy is strongest when it is used in combination with pharmacological treatment, although where individuals are unable to tolerate medication, or express a desire to avoid pharmacological treatment, then psychological therapy such as cognitive behavioural therapy alone should be considered as a valid treatment approach. In a systematic review of the behavioural and cognitive impacts of mindfulness-based interventions on adults with attention-deficit hyperactivity disorder, Poissant et al (2019) concluded that mindfulness-based interventions improved attention deficit hyperactivity disorder symptoms, and mindfulness meditation training improved some aspects of executive function and emotion dysregulation. Uncontrolled studies have also shown some preliminary positive outcomes for coaching techniques, although there is no standard approach to the way that coaching is delivered, and so further research is needed.

The evidence base for the effectiveness of non-pharmacological interventions in treatment of adult attention deficit hyperactivity disorder is limited and most of it is extrapolated from attention deficit hyperactivity disorder in children. Any patient (and partner or family, if appropriate) who has received a diagnosis of attention deficit hyperactivity disorder should be offered psycho-education about attention deficit hyperactivity disorder, its symptoms, diagnosis, prognosis and treatment.

Key points

- Attention deficit hyperactivity disorder is a persistent pattern of inattention and/or hyperactivity-impulsivity that interferes with functioning or development.
- In 50–66% of children with attention deficit hyperactivity disorder it can persist into adulthood.
- Adult attention deficit hyperactivity disorder is often missed or misdiagnosed by non-specialists because of lack of awareness of attention deficit hyperactivity disorder, the number of overlapping symptoms with other psychiatric conditions, and the high rates of comorbidity.
- Attention deficit hyperactivity disorder responds well to pharmacological intervention, although there is a growing body of evidence to support the use of non-pharmacological approaches such as cognitive behavioural therapy and coaching, particularly when used in combination with pharmacological treatment.

In the UK, the National Institute for Health and Care Excellence (2018) guidelines recommend that psychological interventions should be considered where the patient has made an informed choice not to have medication, has difficulty adhering to medication or has found medication to be ineffective or cannot tolerate it. Non-pharmacological treatment in combination with medication should also be considered for adults who have benefited from medication but whose symptoms are still causing significant impairment in at least one domain. Non-pharmacological interventions, in this context, include psycho-education and behavioural therapies (cognitive behavioural therapy and neuro feedback).

Conclusions

Attention deficit hyperactivity disorder persists into adulthood in many patients and its presentation can vary in terms of both symptomatology and comorbidity. Most cases of adult attention deficit hyperactivity disorder go undetected and hence untreated. However, once correctly diagnosed attention deficit hyperactivity disorder is a highly treatable condition which responds well to treatment, in particular pharmacological intervention. Non-specialists have an important role in identifying people who they suspect may have attention deficit hyperactivity disorder and signposting them to specialist services for diagnosis and treatment.

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Conflicts of interest

J Johnson runs a service for patients with attention deficit hyperactivity disorder and is a consultant for the North West Boroughs Healthcare NHS Foundation Trust. He has received honoraria for talks at training events supported by Janssen, Flynn Pharma and Takeda/Shire Pharmaceuticals. S Morris works with J Johnson as a pharmacist independent prescriber in both NHS and private practice adult attention deficit hyperactivity disorder clinics. She has been on an advisory board for Shire Pharmaceuticals and received honoraria for doing talks on the treatment of attention deficit hyperactivity disorder for Flynn Pharma and Takeda/Shire Pharmaceuticals. She has also received sponsorship from both companies to attend educational and training events on adult attention deficit hyperactivity disorder. S George has no conflicts of interest to declare.

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